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Report to the Chairman, Subcommittee on Military Personnel and Compensation, Committee on Armed Services, House of Representatives

April 1991

RESERVE COMPONENTS

Factors Related to Personnel Attrition in the Selected Reserve

GAO/NSIAD-91-135

GAO

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International Affairs Division

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April 8, 1991

The Honorable Beverly B. Byron
Chairman, Subcommittee on Military
Personnel and Compensation
Committee on Armed Services
House of Representatives

Dear Madam Chairwoman:

This report responds to your request that we examine personnel retention in the Selected Reserve. As you requested, we focused our work on the causes and extent of personnel turnover in the units of the Selected Reserve.

We will send copies of this report to the Chairmen, House and Senate Committees on Armed Services and on Appropriations; the Secretaries of Defense and the Army, Air Force, and Navy; and other interested parties on request.

If you or your staff have any questions, please call me on (202) 275-3990. Other major contributors are listed in appendix VI.

Sincerely yours,

Paul L. Jones
Director,
Defense Force Management Issues

Executive Summary

Purpose

The Selected Reserve, as part of the Ready Reserve, must be able to provide the combat and combat support units and personnel to augment the active forces during a national emergency. Because of the importance of the Selected Reserve, the Subcommittee on Military Personnel and Compensation, House Committee on Armed Services, asked GAO to examine enlisted personnel retention in the Selected Reserve to determine the extent, causes, and effects of personnel attrition. GAO also identified military, economic, and environmental factors affecting personnel turnover and evaluated the effectiveness of current management procedures related to attrition in the Selected Reserve.

Background

There are three reserve component categories: the Ready Reserve, the Standby Reserve, and the Retired Reserve. Under the Department of Defense's (DOD) Total Force policy, reservists will be the primary source of personnel to augment the active forces in military emergencies such as the recent crisis in the Persian Gulf. The majority of these reservists will come from the 1.6 million members of the Ready Reserve, which consists of the Selected Reserve, the Individual Ready Reserve, and the Inactive National Guard.

The Selected Reserve is comprised primarily of part-time drilling reservists in the Army, Air Force, Naval, and Marine Corps Reserves and the Army and Air National Guard. It also has some full-time personnel. The Selected Reserve includes individuals assigned to units and active service organizations and individuals who have not completed initial training. Most members of the Selected Reserve are assigned to mobilization units and must participate in 48 drills (inactive duty training periods of at least 4 hours) and at least 2 weeks of active duty annually.

It is not yet clear what role the reserves will play given the reduction of tensions in Europe and the aftermath of Operations Desert Shield and Desert Storm. However, it is clear that attrition will need to be managed. The reserves need to be able to retain who they need, not just those who stay.

Results in Brief

The Selected Reserve lost a total of 220,909 enlisted personnel in fiscal year 1988. Reported attrition rates (for all types of losses, including retirements, discharges, transfers, and deaths) ranged from 11 percent in the Air National Guard to 30 percent in the Army Reserve. Much of the turnover in National Guard and Reserve units is due to the unprogrammed loss of reservists who stop participating in training before

their enlistment terms are completed. In fact, four out of five enlistees without previous military service failed to complete their 6-year enlistments. They constitute the majority of overall losses in the Selected Reserve.

Because personnel losses are unevenly distributed across grade groups, overall loss rates mask the extent of losses in particular groups. Also, the geographical dispersion of units prevents the transfer of reservists to fill shortages in other units. However, with the existing reserve personnel data base, a large number of losses cannot be identified by unit or state and some losses are incorrectly categorized.

Job conflicts, dissatisfaction with training and enlistment terms, and delayed receipt of reserve pay contribute to attrition. GAO's analysis showed that reservists who were not trained for their current duty position were the most likely to leave the Selected Reserve.

Dealing with reservists who fail to participate in inactive duty training is difficult because of limited enforcement options.

DOD and individual reserve components have programs designed to reduce attrition and improve reserve retention. These programs include efforts to reduce grade stagnation, improve the effectiveness of recruiting and retention bonuses, and help reservists who must relocate to find new units. However, other innovative approaches appear to warrant some consideration and/or testing.

Principal Findings

Nonprior Service Personnel Are Higher Attrition Risks

The reserve components depend on recruits with and without prior military service to meet their manpower requirements. Although nonprior service recruits made up 42 percent of the enlistments in fiscal year 1988, they constituted 61 percent of overall losses in the Selected Reserve. The loss of nonprior service personnel also represents a direct cost to the reserve components for recruitment and training.

More Comprehensive Attrition Information Needed

DOD's attempts to resolve the attrition problem have been hampered by inadequate attrition information. Aggregated attrition data can mask the effects of attrition when losses are concentrated in certain grade groups or certain units. For example, although the overall Marine Corps Reserve loss rate was 28 percent, attrition for those in grades E4-E5 was 45 percent. Also, while the Army Reserve's overall attrition rate in California was 35 percent, 71 percent of the units had high loss rates (i.e., attrition rates above 42 percent).

Unlike the active components, individual reservists cannot be readily transferred between units to make up personnel shortages. For this reason, unit loss data should be more important to decisionmakers than aggregate loss data.

The Reserve Component Common Personnel Data System, the official source of manpower information, (1) could not identify approximately 28 percent of enlisted losses in fiscal year 1988 by unit or state, (2) understated transfers from the Selected Reserve to the Individual Ready Reserve, and (3) could not identify 11 percent of losses by type. Some of this was due to the lack of common, consistent definitions of attrition which results in losses being incorrectly categorized.

Reserve Environment Is a Factor in Attrition

Many of the attrition problems in the reserve components are an inherent aspect of the reserve environment. The effects of the Desert Shield/Desert Storm call-up could exacerbate the attrition problem. Because reserve service is, in essence, a second job for most of the reservists, competing demands of their regular jobs and leisure time are important factors in attrition.

Policy for Dealing With Nonparticipating Reservists Needed

DOD has no uniform policy for dealing with reservists who fail to honor their obligation to participate in inactive duty training. Realistic enforcement options are limited by the voluntary aspect of reserve duty and the primarily part-time nature of reserve participation. Since the demise of the draft, imposing involuntary active duty for nonparticipation does not appear to be a viable option.

Initiatives to Reduce Attrition

DOD and the various reserve components have a variety of programs aimed at reducing attrition. However, GAO identified a number of other

potential opportunities to improve existing retention programs. For example:

- modifying existing bonus programs to emphasize retention,
- establishing age and service-in-grade limitations for reservists to improve promotion opportunities and encourage younger reservists to remain in the Selected Reserve, and
- assisting reservists who relocate to find new units.

Recommendations

GAO recommends that the Secretary of Defense

- consider actions (such as more timely receipt of reserve pay) which could alleviate attrition factors inherent to the reserve environment;
- develop a uniform policy for dealing with nonparticipating reservists consistent with their status as part-time volunteers;
- develop more accurate measures of attrition, establish common definitions for attrition, and improve the accuracy of the Reserve Component Common Personnel Data System as a source of attrition information; and
- direct the services to examine the nature and extent of potential ramifications associated with their reliance on nonprior service recruits to meet manpower requirements.

GAO is also recommending a number of different approaches for improving the retention program.

Agency Comments

DOD either concurred or partially concurred with all of GAO's findings and all but one recommendation and plans to implement action in response to most of the recommendations. DOD did not concur with the recommendation to test the feasibility of paying reservists at the end of their weekend drill period because it believes that it would involve too many administrative problems. GAO continues to believe that a feasibility test would determine whether potential benefits outweigh implementation difficulties.

Contents

Figures

Abbreviations

ANG	Air National Guard
ARNG	Army National Guard
DMDC	Defense Manpower Data Center
DOD	Department of Defense
GAO	General Accounting Office
IRR	Individual Ready Reserve
USAR	Army Reserve
USAFR	Air Force Reserve
USMCR	Marine Corps Reserve
USNR	Naval Reserve

Introduction

The reserve components of the Department of Defense (DOD) consist of the Army National Guard, Army Reserve, Naval Reserve, Marine Corps Reserve, Air Force Reserve, and Air National Guard. The Coast Guard Reserve is a part of the Department of Transportation and is not included in our review. The reserve components are important to our national security because they provide the combat and combat support units and personnel to augment the active forces during a national emergency or war, such as the recent Persian Gulf crisis.

There are three reserve component categories: the Ready Reserve, the Standby Reserve, and the Retired Reserve. Under DOD's Total Force policy, reservists, rather than draftees, will be the initial and primary source of personnel to augment the active forces in military emergencies.[1] The majority of these reservists will come from the 1.6 million members of the Ready Reserve, which consists of the Selected Reserve, the Individual Ready Reserve (IRR), and the Inactive National Guard.

From 1980 through 1988, despite significant increases in strength and the quality of recruits, there has been a high personnel turnover in National Guard and Reserve units. In 1988, reported personnel loss rates ranged from about 11 percent in the Air National Guard to more than 30 percent in the Army Reserve. During this same period, only one out of five nonprior service enlistees completed their 6-year enlistments in the Selected Reserve.

Although attention usually focuses on losses in the Army National Guard and Army Reserve because of the numbers involved, both the Naval Reserve and Marine Corps Reserve also have high personnel loss rates. Also, the Air Force Reserve and Air National Guard, despite their relatively low overall loss rates, still lose a significant percentage of their nonprior service personnel. The loss of nonprior service personnel before the end of their enlistments is particularly troubling, not only because of the substantial training costs involved, but also because the significant improvements in the quality of recruits in the 1980s has not been accompanied by improvements in retention. Table 1.1 shows the total losses for each reserve component. (Table 2.1 shows the breakdown of these losses by category.)

[1]The Total Force policy, which was formalized in 1973, essentially considers the active and reserve components as equal partners in defense plans.

Table 1.1: Fiscal Year 1988 Selected Reserve Enlisted Personnel Strength and Losses

Reserve component	Strength	Total losses	
		Number	Percent
Army National Guard	406,966	75,440	18.5
Army Reserve	253,467	77,119	30.4
Naval Reserve	121,653	35,061	28.8
Marine Corps Reserve	39,930	11,325	28.4
Air National Guard	101,261	10,747	10.6
Air Force Reserve	65,567	11,217	17.1
Total	**988,844**	**220,909**	**22.3**

Note: Includes all types of reported losses, such as discharges, retirements, transfers to other active duty or reserve components, and deaths.

The Selected Reserve

The Selected Reserve is comprised of both full-time[2] and part-time drilling reservists[3] and includes individuals assigned to units, trained personnel assigned to active service organizations, and individuals who have not completed initial training. Most members of the Selected Reserve are assigned to mobilization units and must participate in 48 drills (inactive duty training periods of at least 4 hours) and at least 2 weeks of active duty annually.

Selected Reserve personnel strength increased by about 283,000 (40 percent) from 1980 through 1988. Unlike the active components, which primarily rely on recruits from civilian life, the Selected Reserve obtains personnel from a variety of sources: civilian life, the active components, other reserve components, and former active or reserve personnel in the IRR.

Most units in the Selected Reserve are organized in a similar manner to their active component counterparts and are authorized the same or compatible equipment and number of personnel. The exception is the Naval Reserve's noncommissioned units, which serve as mobilization reinforcements for active Navy organizations and installations.

In the reserve components, force structure organization is more dependent on demographic than operational considerations. There is a considerable geographic dispersion of units, especially in the Army National

[2]Full-time reservists are members of the Selected Reserve ordered to active duty or full-time National Guard duty for organizing, training, and administering reserve component units and are federal civilian employees providing full-time support to units who are also drilling reservists in the units.

[3]Part-time reservists are trained unit members who participate in unit training activities on a part-time basis.

Guard, Army Reserve, and the Marine Corps Reserve, which often results in separation of units and their controlling headquarters. Some Marine Corps Reserve battalions have units spread over several states, as do Army Reserve units. This dispersion is not as great in the Army National Guard, as most units are located in the same state. Air Force Reserve and Air National Guard units are often located at or near active component air facilities.

The President may mobilize as many as 200,000 Selected Reserve members for up to 90 days without declaring a national emergency and up to 1 million members of the Selected Reserve and IRR for as long as 2 years, after declaring a national emergency.

Prior to 1984, individuals joining either the active or reserve components were subject to a total 6-year military service obligation, which could be satisfied by a combination of active and reserve duty. In 1984, the total military service obligation was increased to 8 years. However, personnel who complete an active duty enlistment, but have not satisfied the military service obligation, are not always required to serve in the Selected Reserve, but may satisfy their remaining military service obligation by membership in the IRR. Reservists who complete an enlistment (normally 6 years for nonprior service personnel) in the Selected Reserve can finish their military service obligation in the IRR. Individuals in the IRR are usually not required to, but may voluntarily participate, with or without pay, in training for retirement or promotion credit and are usually not required to attend active duty training.

Objectives, Scope, and Methodology

Our objectives were to (1) examine enlisted personnel retention in the Selected Reserve to determine the extent and effects of attrition in the Selected Reserve, (2) identify the military, economic, and environmental factors affecting personnel attrition, and (3) evaluate the effectiveness of current attrition/retention management procedures in the Selected Reserve.

We examined fiscal year 1988 enlisted personnel losses in the Selected Reserve using attrition and strength data from the Defense Manpower Data Center (DMDC), the individual services, and directly from units we visited. We also analyzed a sample of fiscal year 1987 enlisted losses to determine attrition factors. Details on the data sources are contained in appendix I; a description of the unit attrition analysis is contained in appendix II; the description of our analysis of attrition factors is contained in appendix III; and the list of units visited is in appendix IV.

Our approach was to develop loss information by individual reserve units to determine attrition patterns based on military, economic, and environmental factors, such as military specialties, unit missions, employment conditions and status, and geographical influences. We supplemented this unit work with an analysis of individual losses from the Selected Reserve during fiscal year 1987, using the data base from the 1986 Reserve Component Survey.[4] We used unit case studies to develop the relationship between unit conditions and attrition patterns and to determine the effectiveness of different attrition management practices.

We focused on unit losses because aggregate loss data are not as indicative of personnel readiness in the reserve components as it is in the active components. Additionally, there has been little work examining retention/attrition as it relates to the unit environment, as most previous attrition studies have focused on individual characteristics, such as education, test scores, race, and sex.

We met with senior officials in the National Guard and Reserves, interviewed officials responsible for reserve retention, and reviewed attrition studies to develop a questionnaire for our unit case studies. This questionnaire was designed to supplement unit attrition data with information on the unit environment, such as missions, equipment, training facilities, and factors affecting personnel losses. We judgmentally selected units to provide a cross section of the types of units and organizations in the Selected Reserve and reflect regional influences. The selection was based on results of preliminary data analysis, overall attrition information, and reserve component input. For example, we selected both high and low loss units, flying and nonflying units, combat and support units, and rural and urban area units. The unit case studies also provided a basis for comparing field loss data with information provided by DMDC.

We used the data base from the 1986 Reserve Component Survey to analyze individual losses in the Selected Reserve. We compared this data to the 1987 and 1988 reserve and active service personnel files to determine the actual reserve attrition from the 1986 sample. This part of our analysis was restricted to losses to the IRR or civilian status that occurred prior to completion of service in Selected Reserve units. Transfers between reserve components or into the active component, as well

[4]The 1986 Reserve Component Survey, which was conducted for DOD by the Research Triangle Institute with the collaboration of Decision Science Consortium, Inc., and DMDC, contains a large and comprehensive data set on both military and civilian background information for officer and enlisted members in the Selected Reserve.

as the decision not to reenlist after the commitment period, were not included. We utilized the multivariate logit statistical technique[5] to identify the factors that contribute to personnel leaving or staying in the Selected Reserve. The logit model enabled us to examine the relative importance and effects of different factors on actual losses from the Selected Reserve over a 2-year period.

DMDC also provided individual data on transfers to the IRR for all reserve components, except the National Guard. The Army provided data on transfers to the IRR from the Army National Guard. We used these data to examine grade, military skill, and service status distributions of these personnel.

We conducted our review between March 1989 and December 1990 in accordance with generally accepted government auditing standards.

[5]This is a statistical technique that identifies the effects of multiple predictor variables, some of which are qualitative, on a dichotomous criterion variable.

Attrition Analysis

According to DOD, overall personnel loss rates in the Selected Reserve during fiscal year 1988 were approximately 22 percent, about double the loss rate for the active components. Only the Air National Guard had a lower loss rate than its active counterpart. One explanation for the higher loss rate in the reserve components is the voluntary nature of reserve service that enables many reservists to leave the Selected Reserve before their enlistments expire. They also leave for such reasons as failure to participate in reserve training, conflict with civilian jobs, and change of residence.[1] Most reservists who leave for these reasons are transferred to the IRR.

We examined losses in the Selected Reserve by grade and prior service status to determine the types of personnel in different loss categories and to provide a basis for determining the effects of losses. Our analysis was made on both a force, and where possible, a unit level with data provided by DMDC and the individual reserve components.

Losses in the Selected Reserve

Some types of losses experienced by the Selected Reserve are similar to those experienced by the active forces—completion of term of service; retirements; discharges for medical, aptitude, misconduct, etc.; and deaths. The Selected Reserve also has losses due to realignments, such as transfers to active or other reserve components, change of status from enlisted to officer, and transfers to the IRR and Inactive National Guard. The total reported losses in the Selected Reserve for fiscal year 1988 were 220,909. Table 2.1 shows these losses broken down by loss category and by reserve component, according to DOD's official information.[2]

[1]Losses which occur prior to the end of enlistments are classed as unprogrammed losses.

[2]Office of the Secretary of Defense, Official Guard and Reserve Manpower Strength and Statistics, FY 1988 Summary.

Table 2.1: Fiscal Year 1988 Enlisted Personnel Losses

Category	ARNG	USAR	USNR	USMCR	ANG	USAFR	Total
To civilian life[a]	31,201	17,814	8,981	4,022	5,610	1,976	69,604
Death	592	291	95	50	94	57	1,179
Other[b]	603	21,026	1,145	306	1,270	185	24,535
To active component	4,554	6,787	1,366	341	0	421	13,469
To other reserve component	28,269	5,940	0	454	3,373	981	39,017
To IRR/ING[c]	7,976	24,823	23,232	6,124	0	6,319	68,474
To Standby Reserve	0	135	25	1	0	545	706
To retirement	0	263	214	27	0	578	1,082
To officer	2,245	40	3	0	400	155	2,843
Total	**75,440**	**77,119**	**35,061**	**11,325**	**10,747**	**11,217**	**220,909**
Percent loss	19	30	29	28	11	17	22

[a]Discharge

[b]Unknown

[c]Inactive National Guard

The losses shown include full-time personnel,[3] individual mobilization augmentees[4] who are not assigned to units, and part-time, drilling reservists. (Table 1.1 shows the total strength of each component and the percentage of losses for each component.) The actual loss rates for drilling reservists, which are higher than the overall loss rates, are discussed later in this chapter. Losses of any type affect reserve component units, but only some of them can be influenced by the reserve leadership. The Army refers to these as manageable losses, and the Air Force Reserve calls them avoidable losses. They include transfers to the IRR, certain categories of discharges, and some types of transfers to other reserve components. The most important are the transfers to the IRR, because of the number of reservists in this category.

Transfers to the IRR Represent Largest Loss

Transfers to the IRR make up the largest single category of losses in the Selected Reserve. The DOD information shown in table 2.1 understates the number of transfers to the IRR because it does not include members of the National Guard due to apparent errors in transaction coding. The

[3]Nearly one-third of Air National Guard members serve in a full-time status, from which attrition is relatively low. By contrast, less than one-tenth of the Army Selected Reserve serve as full-time military technicians or as active guard and reserve members.

[4]These are trained individuals who are assigned to an active component organization, a Selective Service Station, or a Federal Emergency Management billet that must be filled on or shortly after mobilization.

7,976 Army National Guard personnel shown include only those transferred to the Inactive National Guard. Army data indicate that approximately 13,428 more members of the Army National Guard were transferred to the IRR in fiscal year 1988. According to the Air Force Reserve Personnel Center, approximately 2,600 members of the Air National Guard were also transferred to the IRR.

Reservists can be transferred to the IRR either voluntarily or involuntarily. Most involuntary transfers are for failure to participate in inactive duty training. The usual practice in the reserve components is to transfer reservists with time remaining in their 8-year military service obligation if they have accumulated a specified number of unexcused absences from drills (inactive duty training periods) during a 12-month period.

We examined DMDC data on 59,498 personnel transferred to the IRR from the Army, Air Force, Naval, and Marine Corps Reserves, and Army data on 13,128 personnel transferred from the Army National Guard. All personnel were identified by grade, service status, and primary military specialty. We compared losses in selected military specialties across the reserve components to determine if some military specialties had different loss patterns than other specialties.

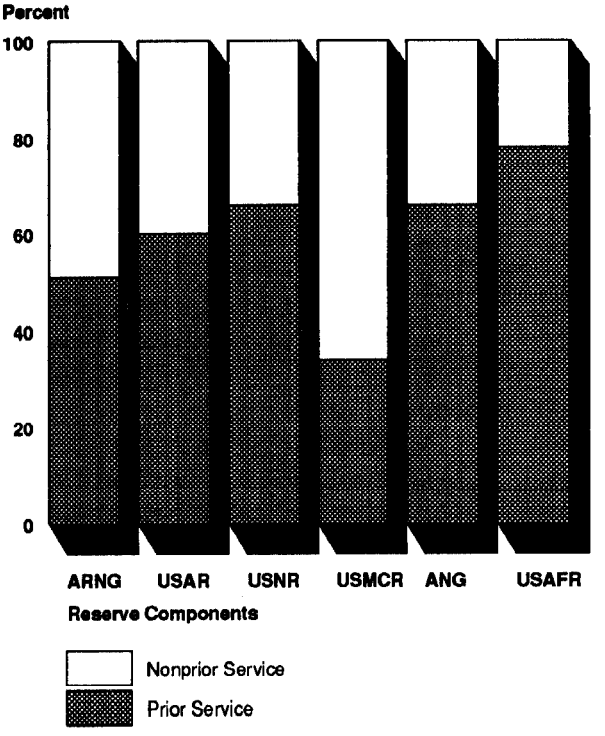
We judgmentally selected seven DOD occupational codes (two combat-related and five technical) for our analysis.[5] We selected representative occupational codes that had high population densities, provided a combat and technical skill comparison, or provided a basis for cross-service comparison. We noted patterns across the services in most of these specialties. Infantry specialties in the Army National Guard and Reserve had lower loss rates than artillery specialties, while the reverse was true for the Marine Corps Reserve. Losses in Air Force Reserve specialties associated with aircraft repair were substantially lower than in supply and radio communication areas. Losses in aircraft engine repair specialties were the lowest in all components, except the Army National Guard where they were approximately 23 percent. The low loss rates in technical specialties, such as aircraft engine repair, may be a reflection of the large number of full-time reservists in the specialty. The results are shown in table II.3.

[5]DOD occupational codes define groups of military specialties across the services.

Prior Service and Nonprior Service Losses

The reserve components recruit individuals with prior military experience—active or reserve—and those with no military experience to meet their manpower requirements. According to DOD, nonprior service personnel accounted for 42 percent of the total enlisted gains in fiscal year 1988. Figure 2.1 shows that the degree of reliance on each category varies from the Marine Corps Reserve's 66-percent nonprior service enlistments in fiscal year 1988 to the Air Force Reserve's 22 percent. The ratio of nonprior and prior service enlistments has remained generally the same over the last 5 years, except in the Marine Corps Reserve, which has been gradually increasing its proportion of nonprior service recruits.

Figure 2.1: Ratio of Prior and Nonprior Service Gains and Losses in Fiscal Year 1988



We examined the prior service status of approximately 157,000 losses from units in the Selected Reserve using three prior service categories: more than 23 months of active service, less than 23 months of active service, and no prior service. Nonprior service reservists made up 61 percent of the unit losses, while 36 percent of the losses were reservists

with more than 23 months of prior active service, and the remaining 3 percent were reservists with less than 23 months of service.

We did not find a direct relationship between loss rates and the number of nonprior service recruits in all the reserve components. However, the Marine Corps Reserve had one of the highest loss rates and approximately a 2-to-1 ratio of nonprior to prior service losses. The fact that neither the Air Force Reserve nor Air National Guard had a high percentage of nonprior service enlistees appears to be a factor in their lower loss rates.

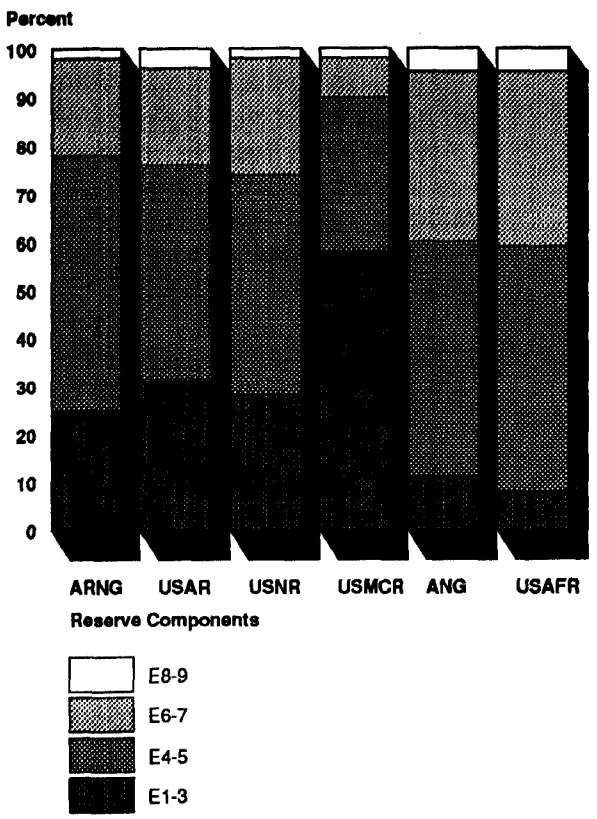
The loss of nonprior service reservists receives the most attention because they represent a direct cost to the reserve components, since DOD estimates it costs about $21,000 to train a reservist. Also, almost 80 percent fail to complete their initial enlistment.

In the long run, however, the failure of the Selected Reserve to retain prior service recruits may have the most damaging effects on the total force because it means the loss of more experienced personnel that the reserve components need.

Personnel Turnover Causes Turbulence in Units

High personnel turnover rates in units cause turbulence as personnel must be moved within the unit to fill key vacant positions and/or new personnel must be recruited. The effects can be amplified when the losses are concentrated in certain grade levels in a unit.

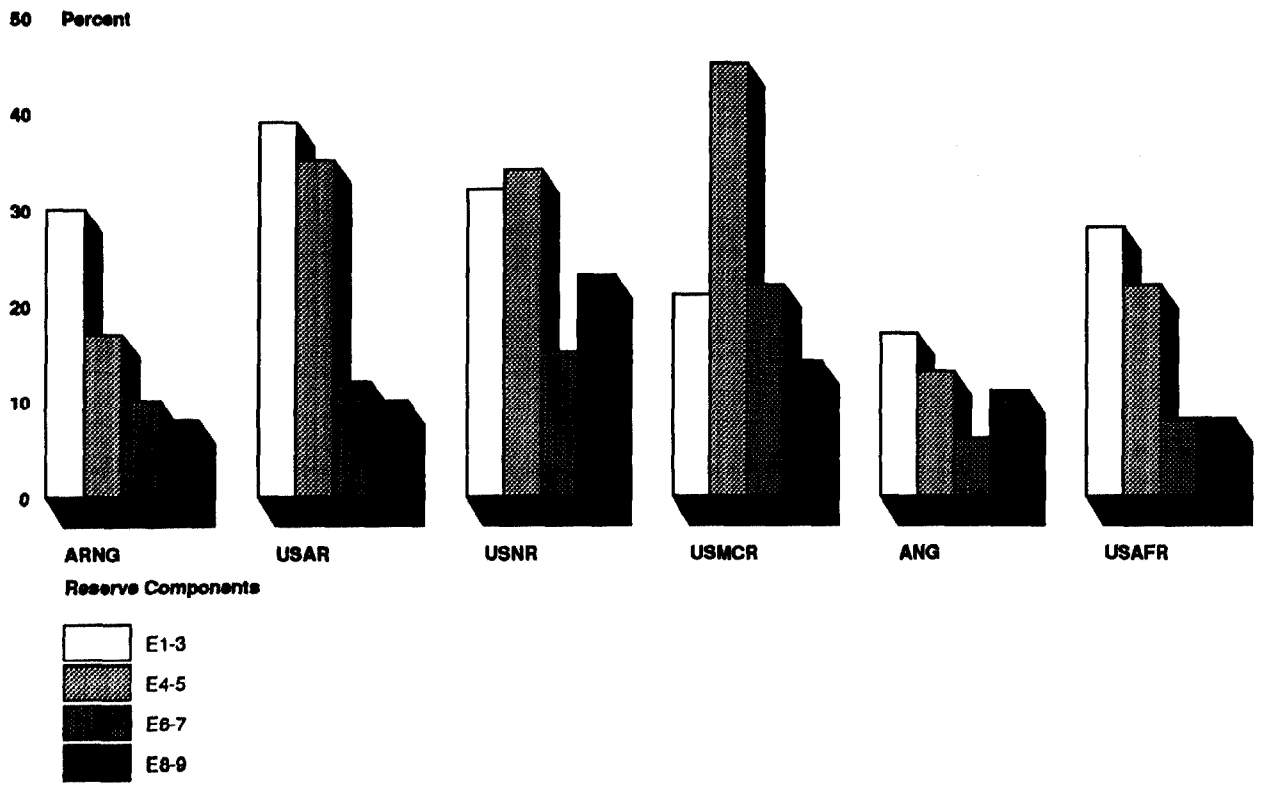
Figure 2.2: Reserve Component Grade Profile



The enlisted force profiles of the reserve components differ markedly, as shown in figure 2.2. In the Marine Corps Reserve almost 60 percent of personnel are in grades E1-E3, while grades E1-E3 make up slightly less than 10 percent of the Air Force Reserve and Air National Guard. Enlisted personnel in grades E1-E5 normally fill team, crew, and junior leadership positions, while grades E6-E9 fill senior leadership and skill positions.

Enlisted losses are not distributed evenly across the force but are concentrated in the lower grade levels. The losses by grade group for each of the reserve components are shown in figure 2.3.

Figure 2.3: Loss Rates by Enlisted Grade Groups



As can be seen in figure 2.3, although the overall loss rate in the Army National Guard was 19 percent, approximately 48 percent of personnel in grades E1-E5 were lost. Similarly, the overall Marine Corps Reserve loss rate of 28 percent masks the loss of 45 percent of those in grades E4-E5.

According to DOD, the effects of personnel turnover are compounded by unprogrammed losses in units. The resulting turbulence affects personnel readiness because it hampers units in reaching higher levels of training, requires repetitive training cycles to train new teams and crews, and contributes to the problem of duty position qualification.

Loss Rates of Drilling Reservists

Reported loss rates are based on total losses and strengths in the Selected Reserve and include both full-time and part-time drilling reservists. Table 2.2 shows the difference between reported total loss

rates and loss rates of drilling reservists. In every component the drilling reservists' loss rate is slightly higher. The Naval Reserve has the greatest difference due to its relatively high ratio of full-time personnel.

Table 2.2: Comparison of Percentages of Total Losses and Loss of Drilling Reservists in Fiscal Year 1988

Component	Total losses	Drilling reservist losses
Army National Guard	19	20
Army Reserve	30	31
Naval Reserve	29	34
Marine Corps Reserve	28	29
Air National Guard	11	13
Air Force Reserve	17	19
DOD	22	25

Unit Loss Analyses

Although DOD distinguishes between losses to the total force and realignments within the force, all losses, regardless of type, affect the individual units in the Selected Reserve. Unlike the active components, reservists cannot be easily transferred between units to make up shortages because of the geographical location of units of the reserve components.

We were unable to analyze unit attrition in all the reserve components because of missing data in the unit loss information provided by the DMDC. The unit loss data included approximately 157,000 reservists, or 71 percent of the total official losses of about 221,000. Only the total losses for the Air National Guard were similar to the official number. We also found little correlation between total losses or type losses when we compared DMDC information with that obtained from the units we visited. The details of the data problems are explained in appendix I.

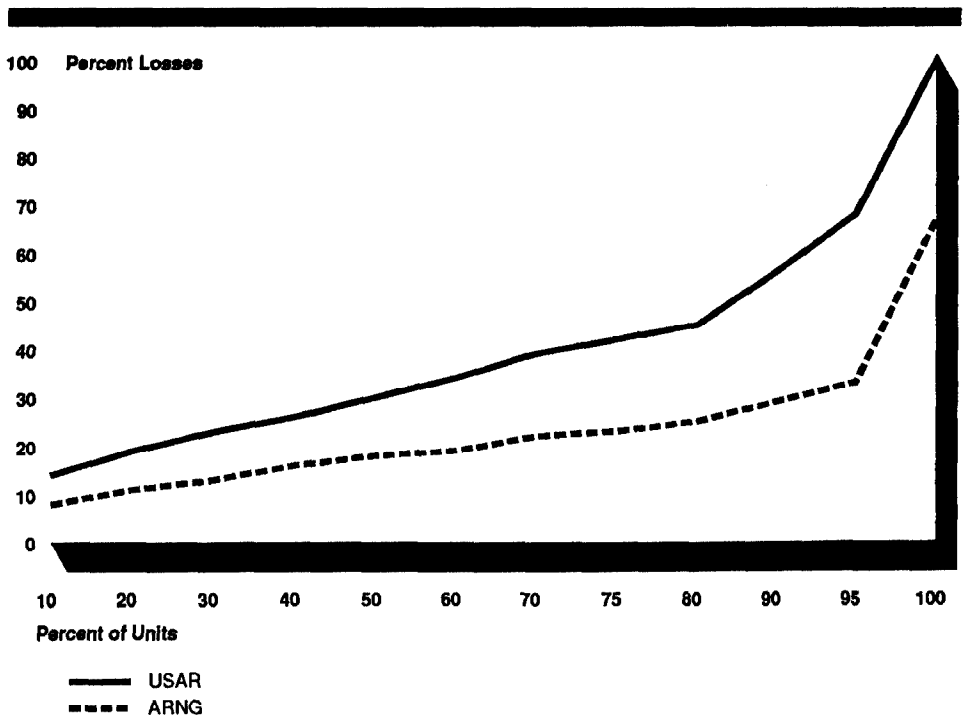
Army National Guard and Reserve Analyses

We were able to conduct some analyses of Army National Guard and Army Reserve units because the Army was able to provide us detailed unit loss data. This included total unit losses and a breakout of losses by service status and selected loss codes identifying discharges and transfers to the IRR. These analyses included a determination of high loss units, a comparison of manageable and total losses, and an examination of aggregated losses and their effects on units. We also examined the effects of unit size, unit proximity to active military installations, and collocation of parent and subunits on unit loss rates.

Determination of High Unit Loss Rates

There is no established criteria for determining high unit loss rates. However, officials at Headquarters, U.S. Forces Command, told us that they generally consider losses in Army Reserve units above 50 percent as high losses. We used the frequency distribution of unit loss rates for the Army National Guard and Reserve to determine a high unit loss rate criterion. We selected the 75th percentile to serve as the high unit loss rate criterion. The distribution of loss rates of Army National Guard and Reserve units is shown in figure 2.4.

Figure 2.4: Distribution of Unit Loss Rates

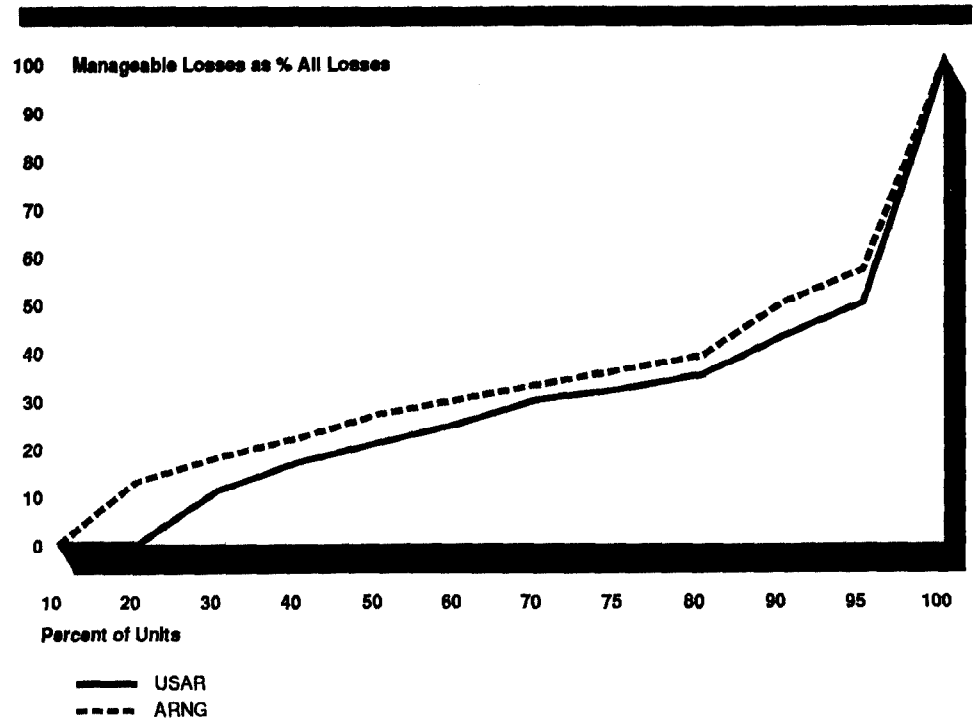


Manageable Losses

Some types of losses cannot be affected by reserve policy or leadership, such as medical discharges, fraudulent enlistments, and transfers to the active or other reserve components. But other losses, such as transfers to the IRR and discharges for misconduct or failure to complete training, can be affected by reserve leadership are considered manageable losses. For this reason, we examined these types of losses, as a percentage of overall losses, to determine their relationship. The results indicate that although Army Reserve units had higher loss rates, manageable loss rates were lower. In 51 percent of Army National Guard units, manageable loss rates were 25 percent or more, while 41 percent of Army

Reserve units had manageable loss rates equal to or greater than 25 percent. The distribution of manageable loss rates as a percentage of total losses is shown in figure 2.5.

Figure 2.5: Distribution of Manageable Losses



Comparison of Overall and Unit Loss Rates

Our comparison of overall losses of units within states showed that overall loss rates did not necessarily indicate the extent of attrition problems in units. For example, the Army National Guard overall loss rate in Texas was 23 percent, but 42 percent of the units were high loss units. Conversely, in Virginia the loss rate was 21 percent, although only 24 percent of the units were high loss units. The comparison for all states is shown in table II.11.

The comparison of Army Reserve units by state was even more revealing because of the Army Reserve's higher loss rates. In Texas where the loss rate was 31 percent, approximately 64 percent of the units were high loss units. California had a loss rate of 35 percent, while 71 percent of the units were high loss units. Comparative figures for all states are shown in table II.10.

The fact that a high percentage of units in a state has high losses, even though the overall loss rate is low, could be an indication of manning and structure problems. A state could have too many units to support with quality reservists. This comparison of aggregated and unit loss rates illustrates why unit loss rates are better indicators of attrition than overall loss rates.

Effects of Unit Size and Location

In many cases, the location of units in the reserve components is dictated primarily by demographic considerations, such as a population base, to provide recruits or availability of special skills. Small units, such as detachments and separate companies, make up a substantial portion of Army National Guard and Reserve units. Our review of size and geographical location factors and their relationship to unit losses showed that smaller units made up a larger proportion of high loss units in both the Army National Guard and Reserve, but that the difference was more pronounced in the Army Reserve.

We also examined two aspects of a unit's geographical location to determine if location on or near active military installations and collocation of parent and subunits affected unit loss rates. Although units located on or near military installations should have better access to training facilities than those units that are not, the effect on unit loss rates is minimal. Table II.7 shows the comparative loss rates for units according to their proximity to military installations.

Unlike the active Army, many subunits in the Army National Guard and Reserves are often not collocated with their parent elements. This dispersion of units did not appear to have a negative effect on loss rates. On the contrary, in the Army National Guard dispersed units were less likely to be identified as high loss units.

DOD Needs Better Attrition Information

DOD's attrition management is hampered by the lack of accurate and meaningful attrition information. Published loss data from the Reserve Component Common Personnel Data System do not always reflect the correct categorization of losses, such as transfers to the IRR, and most loss data are aggregated to the force level. Although the use of aggregated personnel loss data is suitable for the active components, it is much less useful for the reserve components because the geographical unit organization of the Selected Reserve prevents the easy transfer of reservists between units.

Reserve Component Common Personnel Data System

The Reserve Component Common Personnel Data System is the official source of reserve manpower information. It contains detailed military and personal data for each individual in the reserve components. The services provide status changes on a monthly basis to update the system. However, we are concerned about the accuracy of the published loss data due to the large number of personnel in the unknown or other categories. For example, about 63,000 of the 221,000 enlisted losses in fiscal year 1988 cannot be identified by state or unit assignment. In addition, there were discrepancies in total losses by unit and by loss type when we compared loss data provided by DMDC with service or unit data. DMDC unit loss data for the Army National Guard could not be reconciled with Army data for almost 90 percent of the units; Air National Guard losses to the IRR were not identified; and total losses for the Naval and Marine Corps Reserve were significantly lower than DOD's published information.

The services have detailed loss codes to explain losses which should be translatable to the codes used in the Reserve Components Common Personnel Data System. However, some errors can be attributed to a lack of common, consistent attrition definitions within the services. For example, National Guard losses to the IRR were often categorized as either discharges or transfers to other reserve components. However, many of the data discrepancies cannot be readily explained.

Improved Measures of Attrition

Measures of attrition that provide an accurate view of losses in the Selected Reserve are necessary for effective attrition management. The current overall loss rates and retention rates used by the reserve components can mask the effects of attrition. For example, the reserve components reported first term retention rates ranging from 60 percent for the Army Reserve to 87 percent for the Air National Guard in fiscal year 1988. However, these retention rates were based only on the number of individuals eligible to reenlist and ignored those who left the Selected Reserve before their enlistments expired. Since only 20 percent of non-prior service personnel completed a full enlistment, the actual first term retention rate was probably in the range of 12 to 17 percent.

Measures of attrition should focus on unit loss rates, types of losses, and because of the importance of unprogrammed losses, on losses that occur before the expiration of service terms. As we discussed in our unit analysis, the relationship of manageable losses to the overall losses in a unit is an important indicator of attrition.

For example, transfers to the IRR because of nonparticipation are a cause of more concern than transfers to the active components. Measures of attrition should include the use of common terms and definitions to preclude such situations as a manageable loss in one reserve component being classed as a nonmanageable loss in another.

Conclusions

In general, nonprior service reservists are proportionally higher attrition risks than prior service reservists. They constitute the majority of overall losses in the Selected Reserve and, with the exception of the Air Force and Naval Reserve, in the individual reserve components. The loss of nonprior service personnel also represents a direct cost to the reserve components for recruitment and training. Although prior service losses do not have the same direct cost impact, they may be potentially more damaging to the Selected Reserve because they represent a loss of more experienced personnel.

High personnel losses in units, especially unprogrammed losses of reservists who leave before their enlistment terms are completed, hamper units from reaching higher levels of training, require repetitive training cycles to retrain new teams and crews, and contribute to problems in duty position qualification.

Our analysis of Army National Guard and Reserve unit loss rates showed that although National Guard unit loss rates are lower than in Army Reserve units, manageable loss rates are lower in the Army Reserve. Unit loss rates are an important measure of attrition because of the geographical unit structure of the Selected Reserve, and they can indicate manning and structure problems.

Although the Reserve Component Common Personnel Data System is the official source of manpower information, there are questions about the accuracy of the data. Specifically, a large number of losses cannot be identified by unit assignment and are classified as unknown. In addition, loss transactions do not always reflect the correct type of loss, such as members of the National Guard transferred to the IRR that are classified as discharges or transfers to other reserve components by the National Guard.

Recommendations

To help to properly manage attrition, even in an era of likely force reductions, we recommend that the Secretary of Defense

- direct the services to examine the nature and extent of potential ramifications associated with their reliance on nonprior service recruits to meet manpower requirements;
- develop common, uniform measures of attrition for all services that provide more appropriate and usable data for decisionmakers on losses in the Selected Reserve than the current overall loss rates; and
- improve the accuracy of the Reserve Component Common Personnel Data System.

Agency Comments and Our Evaluation

DOD partially concurred with our recommendation that the services examine the nature and extent of their reliance on nonprior service recruits. DOD indicated that the mix of prior and nonprior service personnel varied significantly among reserve components. DOD reported that its strategy for developing the most appropriate force mix includes the best mix of youth and experience and the ability to maintain that mix. DOD stated that it would establish a more definitive nonprior service/prior service mix strategy for reserve accessions by the end of fiscal year 1991.

DOD stated that it is revising DOD Instruction 7730.54 to clarify definitions and provide better information for the management of reserve component retention and attrition policies. The Instruction, which is now in formal coordination, is expected to be published by the end of fiscal year 1991.

While DOD agreed that more comprehensive attrition information is desirable, it stated that it had standardized attrition information, albeit imperfect, covering all components for many years. DOD stated that it has developed extensive attrition information based on analyses conducted by the RAND Corporation and the Defense Manpower Data Center on losses in the Army National Guard and Reserve. DOD also stated that while DOD data files do not always contain good information on loss type, DOD can accurately identify the most important categories of loss.

Attrition Causes in the Reserve Environment

Reserve component attrition levels have remained relatively unchanged since 1980. The overall loss rate was 25 percent in 1980 and 24 percent in 1988. The lack of change can be attributed, in part, to the influences of the environment. The reserve environment is characterized by the geographical dispersion of units, the part-time status of most reservists, and substantially less training time than the active components. This is complicated by the voluntary nature of reserve service. An individual's decision to leave the Selected Reserve is often the result of a combination of environmental and situational factors. Understanding the effects of the reserve environment is an important aspect in examining the causes of attrition.

The Reserve Environment

Since the Selected Reserve is primarily a part-time force, its members generally have full-time civilian occupations. Membership in the Selected Reserve is similar in many ways to "moonlighting," or having a second job, and must compete with a member's primary occupation, family, and leisure time. Local economic conditions may make the Selected Reserve less financially rewarding than other second jobs or overtime pay opportunities.

According to DOD, several differences exist between reserve service and "moonlighting." They include long-term obligation, intensive and lengthy initial training, absence from the primary job for 2 or more weeks a year, long-term career orientation, and the potential for mobilization. However, the evidence indicates that the second income aspect of reserve participation is a key factor in the decisions of many individuals to join and remain in the reserves and the similarities to other second income sources may affect attrition behavior.

Demands on Time Have Increased

The additional responsibilities placed on the National Guard and Reserves as part of the Total Force policy have increased time demands on members. Increased training requirements and standards mean that the 2 weeks of annual training and 1 weekend a month requirement is only the minimum. Officers and senior noncommissioned officers often spend far more time than this in both paid and unpaid duty status. Unlike the active components, individual reservists have to complete military specialty qualifications and educational requirements while assigned to unit positions. The reserves have no other provision for members to complete required military education in a compensated, inactive status. This means that reservists must devote additional time to satisfy these requirements.

Reserve Participation Is Voluntary

Under present DOD policy, participation in the reserve components is voluntary. Referring to a reservist's commitment as a "military service obligation" is somewhat misleading, as most reservists are allowed to terminate their participation in the Selected Reserve voluntarily.[1] As a consequence, reserve commanders and leaders must contend with reservists who just stop attending weekend drills and, in essence, walk away from their enlistment obligations.

Geographical Dispersion of Reserve Units Poses Training Problems

Reserve units are often located in areas that are not near military installations. This poses problems during normal inactive duty training because all units do not have ready access to training areas, firing ranges, and in some cases their heavy equipment, such as tanks and artillery. For instance, one National Guard armor battalion must store its tanks at a location which is a 4-hour drive from the unit, and an artillery unit must make a 430-mile round trip to reach a firing range. Naval Reserve members assigned to readiness centers that are not located near Navy facilities have few opportunities for hands-on training, except during annual training periods. In contrast, Air Force Reserve and Air National Guard units are usually consolidated and often located at active component installations. According to Air Force Reserve unit officials, the collocation of units is a contributing factor to both lower attrition and higher morale.

Analysis of the 1986 Reserve Component Survey Data Base

Our analysis of losses using the 1986 Reserve Component Survey data base of over 28,000 enabled us to examine the factors contributing to attrition by observing actual attrition behavior. We were able to compare the data base with personnel files to determine actual losses to the Selected Reserve. For the purposes of this analysis, we considered only those who left the reserves or were transferred to the IRR that occurred prior to completion of enlistments. A detailed explanation of this analysis is contained in appendix III. Our analysis showed that 67 percent of the losses were reservists who, at the time of the survey, indicated that they planned to remain in the military for the following year. Conversely, only 16 percent of those who said they planned to leave actually did so. This demonstrates a substantial divergence between intent and future actions.

[1]However, if a unit were mobilized, a member's service would no longer be considered voluntary since the reservist would be in active duty status.

Specialty Mismatches Are Strongly Related to Attrition

Our analysis showed that a mismatch between a reservist's primary specialty and his or her duty specialty was the factor most strongly related to attrition. A severe mismatch almost doubled the attrition rate for reservists and had a far greater effect in the reserves than in the National Guard. Although the Air Force Reserve and Air National Guard had the lowest incidence of military specialty mismatch in the sample, mismatches almost doubled the attrition rate of the Air National Guard and almost tripled that of the Air Force Reserve.

We examined severe skill mismatches across eight broad occupational categories. For example, an infantryman might be assigned in an administrative specialty. Approximately 13 percent of the sample had this type of mismatch, with 10 percent of the nonprior service personnel assigned to duty positions for which they were not qualified. Although nonprior service personnel are usually recruited for unit positions, prior active service personnel may be assigned to duty positions other than their primary military specialty, if the unit they join does not need their specialty. This occupational mismatch was more likely to affect retention of nonprior service than prior service personnel.

According to unit officials, requalifying reservists in new skills was a problem. In our 1988 study of the reserve components,[2] we noted the problems with duty position skill mismatches. Many military occupational specialties can only be acquired by attending active duty schools, which often require extensive periods of active duty. Most reservists are unable to take the time from their civilian jobs to attend these schools. Unit leaders also said that although active duty courses were usually available, an individual reservist often had insufficient advance notification to make arrangements to attend.

Civilian Jobs Can Conflict With Reserve Obligations

Reservists' responsibilities to their civilian employers often conflict with their military obligations. These conflicts may be with normal working hours, overtime, or civilian responsibilities that compete with military duties.

In our analysis, we found that the reported loss of overtime opportunities increased attrition probability. This tends to confirm the predictions of the "Moonlight Model" that the trade-off between civilian income and reserve service is important to reservists. Although the level of civilian

[2]Reserve Components: Opportunities to Improve National Guard and Reserve Policies and Programs (GAO/NSIAD 89-27, Nov. 17, 1988).

earnings did not affect attrition, the type of employment did. Employment in a white collar civilian occupation increased the probability of attrition. This may indicate the possibility of a greater degree of conflict between civilian employment and reserve service for reservists in white collar civilian jobs due to increased responsibilities.

Many unit officials listed job conflicts as a major contributor to attrition. Some units reported instances of employers, such as the U.S. Postal Service or fire departments, actively discouraging membership in the Selected Reserve. Other types of units had different types of civilian occupational conflict. For example, some self-employed people, such as truck drivers, may have limited control over when they work. Others, such as construction workers, are frequently busiest during the summer, when school teachers and students are usually available for training.

According to the 1986 Reserve Component Survey, almost 25 percent of Selected Reserve members were students, most of whom had no prior active service. According to unit officials, they may also have conflicts with training during the school semester or during examinations. The main conflict is that students are a transient population group and graduates frequently relocate at the end of their 4 years of school, before their 6-year enlistment is completed.

Military Backgrounds Influence Attrition

Nonprior service reservists were the most responsive to economic and policy variables. Promotions to higher grades or bonuses increased their retention probability substantially. They were also strongly affected by military skill mismatches, which more than doubled their attrition rate. Reservists with prior reserve service were the least affected by attrition variables.

We separated reservists into three categories based on their military service to determine what effects this had on attrition.

1. Nonprior service—Individuals with no previous military service and in their initial enlistment.

2. Prior active service—Individuals with more than 1 year of active duty service.

3. Prior reserve service—Individuals with more than 6 years of reserve service.

The mean comparisons of the three groups are shown in appendix III, table III.2. The prior active service group was the oldest, best educated, and had the highest civilian earnings. Prior service personnel also had the greatest incidence of military specialty mismatch. The nonprior service sample had the highest probability of enlistment bonus and the lowest average grade or reserve income. Nonprior service personnel were the youngest and had the highest incidence of missed civilian overtime opportunity due to their reserve obligation. The prior reserve service group had the highest average reserve income.

Additional Attrition Factors

During our unit visits, we discussed conditions contributing to attrition of reservists with unit officials. Some of the frequently mentioned causes were delayed receipt of pay and benefits, length of enlistments, dissatisfaction with quality of inactive duty training, and additional training demands.

Reserve Pay Is a Continuing Problem

The 1988 Army Reserve Survey[3] showed that delayed pay and benefits was a major source of dissatisfaction. This was confirmed by personnel at several of the units we visited. One unit commander stated that if he could pay his troops at the completion of their weekend drill, he could cut his unit's attendance problems by at least one-half, because it would be an immediate incentive to attend a weekend drill. Other unit officials agreed with this perception.

We pointed out in our 1988 study that, except for the Air National Guard and Air Force Reserve, reserve pay was a consistent and pervasive problem because of errors and delays in receipt of pay. These two components normally pay inactive duty pay within 10 to 14 days of drill attendance, but other reservists often are not paid until 6 to 7 weeks after they attend a weekend drill. The services have programs underway to improve the reserve pay process but planned improvements do not include paying reservists at the end of a weekend drill.

We believe this quick-pay concept may be a viable means of improving drill attendance, although there may be significant administrative difficulties. To test this concept, it would be necessary to establish a positive pay system in which payrolls would be prepared before the drill instead of after it, as they are now. Reservists not attending a drill would be

[3]1988 Sample Survey of United States Army Reserve (USAR) Troop Program Unit (TPU) Members, Westat, Inc. (Sept. 1988).

taken off the payroll. Such a system might also require that payments be sent to the unit rather than to the individual.

Nonprior Service Enlistment Terms May Be Too Long

DOD does not believe that enlistment terms for nonprior service enlistment terms are too long. However, some program officials individually told us that enlistment terms for nonprior service personnel are too long and, as a result, they are contributing factors to both recruiting and retention problems. Moreover, DOD surveys indicate dissatisfaction with enlistment length is a concern to enlisted personnel.

The lengths of enlistment for nonprior service personnel can vary from 3 to 6 years in the Selected Reserve with the balance of the statutory 8-year military obligation to be served in the IRR. The most common is the 6-year enlistment. Those enlisting for periods of less than 6 years do not qualify for most benefit programs.

Attrition studies have shown that only one out of five nonprior service reservists completed their enlistments. Approximately 21 percent of nonprior service personnel actually completed the full 6-year term of enlistment in 1988. According to the report of the 6th Quadrennial Review of Military Compensation, these unprogrammed losses are a major part of unit turbulence and affect personnel readiness. The 1988 Army Reserve Survey showed that 45 percent of junior enlisted personnel (E1-E4) were dissatisfied with lengths of enlistment terms, which suggests that a 6-year term is not necessarily the optimum length of enlistment. One commander stated that to expect an 18- to 20-year-old to make a commitment for a period of time equal to one-third of his life to that point, and keep it, is unrealistic. Another official pointed out that although he believed that the 6-year enlistment was better for the service, a shorter term would be better for recruitment.

Training in the Selected Reserve Environment

Yearly training time for most members of the Selected Reserve consists of 48 drills of inactive duty training, normally 1 weekend a month, and 2 weeks of annual training, for a total of 38 days or 39 days for National Guard units. Thus, the reservist spends most of his or her training time on inactive duty.

In 1987, a Second U.S. Army study examined a group of high and low attrition units[4] to identify the different characteristics of these units. The study concluded that high attrition indicates other unit problems that affect training and job satisfaction. Senior reserve officials also said that ineffective leadership and poor quality training were major contributors to attrition. However, the effect of poor quality training, especially during inactive duty training periods, is difficult to measure.

Dissatisfaction With Inactive Duty Training Is Related to Attrition

During our unit visits, dissatisfaction with the quality of inactive duty training as compared to annual training or active duty was also mentioned as a cause of attrition. According to the 1988 Army Reserve Survey, almost half of the junior enlisted personnel (E1-E4) were not satisfied with the training they received during drill weekends. DOD's 1986 Reserve Component Survey showed similar perceptions of inactive duty training in some reserve components. Approximately 39 percent of Naval Reserve members were very dissatisfied with their opportunity to use military skills during inactive duty drills. In contrast, members of the Air Force Reserve and Air National Guard expressed relatively high levels of satisfaction.

This dissatisfaction appears to be due mostly to the type of training during weekend drills, although the lack of training facilities and equipment is also a factor. This could explain the large number of reservists with prior active service who leave the Selected Reserve during their initial enlistments. According to a 1989 RAND study of Army Reserve and National Guard personnel who joined during fiscal years 1980 through 1982, 20 percent of prior service losses occur during the first year.[5]

Units that can conduct meaningful inactive duty training during weekends may reduce this attrition factor. For example, flying units usually have lower loss rates than support units. We believe that this is because their training is primarily operationally oriented. In fact, many of these units perform full-time operational missions such as air defense or military airlift. Since this is not the case for most reserve units, the quality of inactive duty training may depend on unit type.

[4]Low attrition units are those with loss rates less than 30 percent, while high attrition units have loss rates of 30 percent or more.

[5]M. Susan Marquis and Sheila Nataraj Kirby, Economic Factors in Reserve Attrition, RAND Corporation (R-3686-RA, Mar. 1989), p. 20.

Our analysis of transfers to the IRR showed that rates were lower for infantry specialties than artillery specialties in the Army National Guard and Reserve. This could be because artillery units do not have ready access to firing ranges, while infantry units have more opportunities to perform mission-type training. Support units may have even more of a problem, since they often do not have missions to perform except during annual training. National Guard medical units in some states are prohibited from providing medical support when they are performing inactive duty training (weekend drills).

Many unit leaders complained about training and administrative requirements imposed on them for such subjects as drug and alcohol abuse, security awareness, and physical examinations. Unit officials said these ancillary training requirements used valuable training time that could be spent on mission training, and questioned the necessity of conducting this type of training on a recurring annual basis.

Annual Training

Annual training usually consists of a 2-week period in the summer. Most reservists expressed satisfaction with the quality of training and the opportunity to use their skills during this time. However, this does not mean that increasing the length of the annual training period is the answer. Some National Guard and Reserve units have participated in extended annual training periods lasting more than 2 weeks to take part in overseas or other special training exercises. This extended annual training was in addition to the normal 48 drills of inactive duty training and sometimes involved extensive additional training.

Overseas Training Opportunities Are a Positive Factor

Although many unit leaders said that overseas training opportunities were a positive retention factor, one Marine Corps Reserve unit lost almost 55 percent of its personnel in fiscal year 1988 after a demanding training program that included overseas deployment. According to officials in another unit that participated in an overseas exercise during annual training, the training opportunity improved morale and retention and most of their losses after annual training were due to individuals applying for active duty. However, some reserve officials pointed out that participating in overseas exercises and other special training often involves extensive administrative preparation and imposes additional training requirements on unit members prior to deployment.

Additional Training Requirements Can Increase Losses

In addition to preparing for extended annual training or overseas exercises, units or individuals may be required to attend additional training due to force structure organizational changes that require new missions or equipment. These additional training requirements can also affect loss rates. In one Army Reserve unit undergoing an organizational change, additional training requirements were established for all leaders by the commander. These demands were viewed as unrealistic by many of the affected individuals and caused many enlisted leaders to transfer out of the brigade. Many unit leaders felt that these additional training requirements and the way they were implemented constituted an "active component solution to a reserve component problem."

Reserve Training Alternatives

Because of the level of dissatisfaction with the quality of inactive duty training, it could be worthwhile to examine alternative allocations of training time for reserve units. Depending on unit missions, equipment availability, and training facilities, drills during the week instead of on weekends or additional active duty training in lieu of the equivalent amount of inactive duty training, might be a more effective approach.

We recognize that there is a need for some continuity of unit operation, but this could be achieved by scheduling weekly or semi-weekly drills. If necessary, senior leaders and key personnel could perform occasional traditional weekend training. Reducing the number of weekend drills could reduce job and leisure time conflicts and result in improved drill attendance, although it could also create conflicts for others.

However, increasing annual training time without reducing inactive duty training time is not necessarily a practical option. In an Army Research Institute study on the effects of extended annual training on attrition, more than 40 percent of unit supervisors stated that extended annual training periods and the associated additional training requirements often resulted in increased attrition.

Conclusions

Many of the conditions which contribute to attrition problems in the reserve components are an inherent aspect of the reserve environment and the increasing demands caused by the Total Force policy. The fact that reserve service is a second job and that there are competing demands between reserve service and leisure time is an important factor in attrition. Our analysis of the factors related to attrition showed that reservists who were not qualified by training for their current duty position were the most likely to leave the Selected Reserve.

Our review indicated that without some innovative approaches, the services may be losing available opportunities to retain those reservists and National Guard members they need. Revising the allocation of training time between inactive duty and active duty to provide units more flexibility and better quality training is one option that we believe warrants some consideration and testing. Testing a pay system that provides prompt financial remuneration, such as paying individuals at the end of each weekend drill, may also have some potential. Improving opportunities for individual skill qualification may also warrant attention.

The timely receipt of pay and benefits is a factor in retention. A system to pay reservists at the end of a weekend drill may offer the potential to improve drill attendance and participation in inactive duty training, if the administrative problems of such a system can be overcome. If weekend pay could improve attendance and reduce nonparticipation levels, it would solve a long-standing problem in the reserve components.

Recommendations

We recommend that the Secretary of Defense test, with selected units of the Selected Reserve, whether

- there are more effective options than the current 1 drill weekend a month and 2 weeks of annual training schedule that would make reserve training more flexible, while still meeting training requirements; and
- it is possible to pay reservists at the end of their drill period as a means to improve attendance and reduce nonparticipation.

Agency Comments and Our Evaluation

DOD partially agreed with our recommendation that alternatives be explored to the current weekend per month and 2 weeks of annual training schedule. DOD noted that reserve components presently have the flexibility to adjust their training schedules to other formats. It also noted that some kinds of units had greater potential for flexibility than others. Nevertheless, DOD stated that during fiscal year 1991, it will review the feasibility of testing our recommendation.

DOD did not concur with our recommendation to test providing pay at the end of weekend drill stating that it would create additional problems, including (1) increased administrative tasks, (2) security for payroll checks, and (3) returning pay for members who miss a drill. However, DOD did not provide any analytic basis for their position. We agree that establishment of a system to pay reservists at the end of a

weekend drill could cause some additional administrative problems. However, such problems could be outweighed by the benefits of improved drill attendance and reduced attrition.

DOD stated, "To resolve pay problems the Reserve components must first ensure that the administrative systems and hardware are in place to fix current problems before experimentation with new procedures." We are concerned that this could perpetuate commitment to existing approaches without any demonstrated ability of those approaches to address the pay lag problem.

DOD cited several efforts underway to improve pay and stated that the DOD Inspector General has been asked to audit the effectiveness of reserve pay systems. While we support such actions, we believe that the issue of pay is too important to reservists to foreclose a test of any alternative based solely on conjectured problems without some empirical data or analysis.

Managing Retention in the Selected Reserve

Managing attrition in the Selected Reserve is complicated by the voluntary, part-time status of most reservists and the difference in the composition and missions of the individual reserve components. The reserve components have management programs that are designed to deal with the problems of reserve attrition and have also implemented several programs to improve retention. For example, the Air Force and Naval Reserves have high year tenure programs[1] to reduce grade stagnation and increase promotions; the Army Reserve, Air Force Reserve, and the Army and Air National Guards have instituted transfer programs for relocating reservists. Enlistment and reenlistment bonuses are used to recruit or retain reservists in critical specialties or for designated units. Some of these programs as currently devised, however, may not be effective retention mechanisms or may cause inequities.

Attrition Management Programs

All the reserve components have retention programs, and the Army Reserve, Air Force Reserve, and the Army and Air National Guards also have formal attrition management programs in addition to their retention programs. The National Guard attrition management program not only establishes policies and procedures for strength management, but also assigns responsibilities for program execution to every echelon down to the first line supervisors.

Most of the unit leaders and reserve officials we interviewed were concerned about attrition. However, several units we visited were unable to provide loss data from the previous fiscal year. Only in the Marine Corps Reserve did senior officials indicate that, in their opinion, they did not have excessive attrition problems, despite their comparatively high loss rates.

Some unit officials said the desire to maintain personnel strength levels should be balanced with concern for retaining quality people. We found that the emphasis on maintaining strength levels in units has in some cases resulted in nonparticipants being retained on unit rolls for several months, rather than being discharged or transferred to the IRR. In other cases, participants who were performing unsatisfactorily were allowed to transfer in and out of units over the objections of the unit commanders, under a general amnesty program aimed at "saving" problem soldiers who were subject to discharge or transfer to the IRR.

[1]High year tenure programs establish grade and service limitations for reservists.

Bonus Programs Need Modification

DOD has several bonus and educational assistance programs designed to improve recruitment and retention in the Selected Reserve. The bonuses are lump sum payments for enlistments and reenlistments or extensions for specified periods in critical or shortage military specialties, and are limited to drilling reservists. Usually, 50 percent of the bonus is paid at the beginning of the enlistment, with the remainder paid at specified times during the enlistment contract. The maximum bonus payment in 1988 was $3,000. Actual bonus amounts vary according to lengths of enlistment and criticality of shortages.

There is also a special affiliation bonus available to active duty personnel who enlist directly in units of the Selected Reserve when they leave active duty. The Naval Reserve, Air National Guard, and Air Force Reserve also offer a special bonus for prior service enlistments. The number of bonus participants in the Selected Reserve and the percentage of drilling reservists receiving bonuses are shown in table 4.1.

Table 4.1: Selected Reserve Bonus Participants in Fiscal Year 1988

Bonus type	USAR	ARNG	USAFR	ANG	USNR	USMCR
Enlistment	23,560	46,196	5,455	9,509	2,511	1,115
Reenlistment extension	31,749	73,208	7,558	9,107	14,952	2,256
Affiliation	10,355	6,995	353	203	1,580	155
Prior service enlistment	[a]	[a]	1,210	2,747	1,235	[a]
Percentage of drilling enlisted reservists receiving bonuses	28	34	28	29	19	9
Percentage of losses	30	19	17	11	29	28

[a]Component does not use this program.

With the exception of the Army Reserve, there appears to be a relationship between the percentage of bonus recipients and service losses. Both the Navy and Marine Corps Reserves have lower percentages of bonus recipients and generally higher loss rates than the other services. The Air National Guard and Air Force Reserve have higher bonus percentages and lower loss rates than the other services. The Army National Guard has a higher percentage of bonus recipients and a lower loss rate than the Army Reserve.

Execution of Bonus Programs Could Be Improved

Some reserve officials are skeptical about the effectiveness of bonus programs on retention. According to some Air Force Reserve officials, a reservist who becomes dissatisfied will quit regardless of the bonus. Marine Corps officials stated that other factors, such as training and leadership, were more important than bonuses. However, our analysis of

attrition factors, using the 1986 Reserve Component Survey data base, showed that bonuses did have a significant effect on retention of non-prior service personnel.

Some unit officials complained that the benefits and bonus programs have become so complex that they are difficult to administer and bonus payments are often delayed. Others have indicated that the bonuses are offered erratically and that the "on again, off again" situation was reported to cause inequities. In one reported case, three individuals reenlisted for the same specialty, but only two qualified for the bonus, because the quota had been filled.

Air Force Reserve Program Modifications

To improve the effectiveness of its bonus programs, the Air Force Reserve decentralized program execution and changed the payment approach. Prior to June 1987, bonuses were based on Air Force Reserve occupational shortages, but this was changed to give wing and group commanders the authority to set bonuses to meet their individual unit's needs. In October 1988, the Air Force eliminated the initial 50-percent bonus payment, and instead paid installments based on drill attendance. When bonuses were paid up front, many reservists left the Selected Reserve before the end of their obligation.

Attrition in the Selected Reserve results in unit problems and is often affected by local conditions. Unlike the active components, shortages in reserve units are not filled by assigning individuals from other units. Decentralization of bonus authority to the unit level might provide the opportunity to concentrate resources where they are most needed.

Current Bonus Programs for Prior Service Reservists Are Not Effective

The loss of large numbers of reservists with prior active service indicates that current bonus programs may not be an effective retention tool for this category of reservists. Our analysis of attrition factors using the 1986 Reserve Component Survey data base showed that bonuses had little effect on the retention of prior service individuals. According to a 1989 RAND Corporation study of economic factors related to reserve attrition, reenlistment bonuses do not affect the loss of prior service personnel, but completion bonuses do improve retention of those who enter the Selected Reserve from active duty.[2] RAND also found that increased pay rates affected lengths of service and estimated that attrition could

[2]M. Susan Marquis and Sheila N. Kirby, Economic Factors in Reserve Attrition, The RAND Corporation, (R-3686-RA, Mar. 1989), p. 42.

be decreased 5 to 9 percent by an increase of 10 percent in the monthly pay rate.

Enlistment and reenlistment bonuses are now paid before the actual completion of the additional service time commitment. Paying such bonuses in monthly installments with special completion bonuses, such as at the end of a year of satisfactory participation, might better emphasize the benefits of continuing service.

Educational Assistance Programs

In 1985, the Montgomery G.I. Bill for the Selected Reserve replaced the Educational Assistance Program. Designed to "encourage membership in the Selected Reserve of the Ready Reserves," it targeted both new recruits and reserve members who had not completed an undergraduate degree. Under its provisions eligible reservists who either enlist or reenlist for at least 6 years receive $140 dollars a month for attending school full-time, or a lesser amount for part-time schooling, for a maximum of $5,040. Approximately 121,000 members of the Selected Reserve are currently participating in this program.

The Department of Veterans' Affairs administers the program and pays benefits, while the Defense Manpower Data Center is responsible for certifying the eligibility of participants. According to some unit officials, it normally takes from 4 to 6 months for a reservist to start receiving benefits under this program. Delays in receiving benefits can reduce the effectiveness of the Montgomery G.I. Bill because this can cause hardships for reservists in school.

National Guard Education Incentives

Several states offer additional educational assistance programs to members of the National Guard. Unit officials mentioned that state educational bonuses or free tuition programs sometimes affected recruiting and retention by attracting people from reserve units and nearby states. We compared the overall loss rates of the different reserve components in states with and without education benefits. We did not find a direct correlation between the availability of these benefits and loss rates between the National Guard and the other reserve components. The Air National Guard had higher loss rates than the Air Force Reserve in six of the seven states with full benefits. The Army National Guard had lower loss rates than the Army Reserve in five of the seven states, but in two states the Army National Guard loss rate was the highest of all components.

We also compared Army National Guard and Reserve unit loss rates in states with full benefits and states with no benefits, to determine if the difference in Army National Guard and Army Reserve loss rates was due to the additional benefits for the National Guard. We found that there was only a slight difference in loss rates in the two cases. The average Army Reserve unit loss rate in the states with benefits was 35 percent and 33 percent in states with no benefits.

Bonus Recoupment Can Be a Problem

DOD's policy is to recoup payments from reservists who have received enlistment/reenlistment bonuses or benefits from the Montgomery G.I. Bill and fail to complete their prescribed service in the Selected Reserve. There are exceptions for those whose bonus eligibility is terminated through no fault of their own, such as illness and injury, which are not due to misconduct, or because units are reorganized or disestablished. Recoupment is generally prorated, based on the amount of service completed.

Recouping bonuses presents problems unless the reservist is a federal employee, or has sufficient military pay due to cover the recoupment. In other cases, according to a DOD official, the service can attempt to recoup through the Internal Revenue Service, if the individual is due a refund, or through the use of collection agencies. Since nonparticipants are unlikely to have any military pay due, they will generally fall in this latter category of bonus recoupment. Modifying enlistment/reenlistment bonus programs to reduce or eliminate up-front payments might result in savings, reduce the need for recoupment actions, and increase the focus on retention.

Improving Promotional Opportunities in the Selected Reserve

The lack of promotional opportunities is frequently cited as one of the reasons for dissatisfaction and attrition in the Selected Reserve. Promotions in the National Guard and Reserves are linked to unit vacancies. If a unit does not have a vacancy, then the reservist either cannot be promoted, must find a new position elsewhere, or transfer to the IRR in a non-pay status.

Because of the geographically restricted unit structure of the reserve components, many of the higher grade positions in units are held by long-term unit members. Many of these reservists remain in the units after they have completed 20 years of service qualifying them for retirement and leads to grade stagnation. For example, while only 6 percent of the Army National Guard enlisted force has more than 20 years of

service, 20 percent of the E6s and almost 40 percent of the E7s and E8s have more than 20 years of service.

Similar conditions exist in the other components, with the exception of the Marine Corps Reserve. The effect of grade stagnation on retention is not present in all components. The Air National Guard, which has the highest percentage of personnel in the upper enlisted grades with more than 20 years service, also has the lowest loss rate.

Programs to Limit Unit Service Can Reduce Grade Stagnation

The Air Force Reserve instituted a high year tenure program to improve promotion opportunities for lower grade personnel by limiting active participation in reserve units to 33 years of service or until age 60, whichever comes first. The Naval Reserve began a high year tenure program in fiscal year 1989 that is more restrictive because it establishes maximum years of service by pay grade. For example, a reservist in the grade of E8 would be allowed to remain in a unit for a maximum of 28 years, while an E5 would be allowed to remain only for 20 years. Some Navy officials stated that the program is not constructive because it separates mid-level E4s and E5s, which are the most desired ranks during mobilization. Others stated that the high year tenure program was necessary and beneficial, although some good people would probably leave early because of it.

Improving Transfer Programs for Relocating Reservists

Members of the Selected Reserve who move for personal or job-related reasons are often transferred to the IRR because there are no units with appropriate vacancies for their grades or skills near their new residence. DOD regulations limit the mandatory assignment of reservists to units within a normal commuting area of 100 miles, or 50 miles if temporary military quarters are not available.

To reduce the losses due to relocation of reservists, the Army National Guard and Reserve and the Air Force Reserve have established formal transfer programs for personnel who move away from their assigned units. The Air Force Reserve program assists in relocating both officers and enlisted personnel. Under the Reserve Vacancy Management System, Air Force Reserve units are authorized to maintain overstrength status for up to 2 years to accommodate relocating personnel. Neither the Naval Reserve nor the Marine Corps Reserve has formal programs to assist reservists who relocate, although some Naval Reserve unit officials believe that a program of this type would be useful.

Neither the Army nor Air Force Reserve programs provide a formal means to assist individuals in finding unit vacancies in the National Guard if there are no vacancies in their own units. The lack of formal coordination between the National Guard and Reserve means that unless reservists find positions on their own initiative, they may leave the Selected Reserve.

Policies for Dealing With Nonparticipants Need to Be Revised

According to unit commanders and senior reserve officials, one of their major problems is dealing with reservists who walk away from their obligation to the Selected Reserve by failing to participate in unit training for their complete enlistment term. Reserve officials want a sanction to prevent this, but there is no consensus regarding what would work or what would be acceptable. DOD has authority to order nonparticipating reservists to involuntary active duty, but it is current policy not to do so.

Reservists are classed as nonparticipants when they accumulate a prescribed number of unexcused absences from inactive duty drills or fail to attend annual training. The Naval and Marine Corps Reserves use a criteria of six drills within a year; the Air Force Reserve uses eight drills; and the Army National Guard and Reserve use nine drills. Weekend training normally consists of four drills, two drills each day.

The disposition of nonparticipants varies between the services. Some are discharged, some are transferred to the IRR, and some Naval and Marine Corps reservists are ordered to active duty. However, most nonparticipants, both nonprior service and prior service, are transferred to the IRR.

Effectiveness of Sanctions Are Limited

The Selected Reserve is a voluntary, primarily part-time force. Since the abolishment of the military draft, reserve service is no longer a substitute for required active service. For this reason, sanctions involving mandatory active duty are not particularly viable, as they would interfere with a reservist's primary livelihood and could discourage recruitment.

The effectiveness of a less-than-honorable discharge as a sanction is also questionable because it might not have much effect on a nonprior service reservist, and it would be difficult to justify such action for a reservist who had honorably completed an active duty enlistment.

Some states have enacted military codes that enable National Guard units to court-martial members for missing drills and sentence them to confinement in civilian jails. We visited a unit in Indiana where this policy was in effect and some unit members had actually been sentenced and confined. Unit officials said that this court-martial authority was a deterrent to nonparticipation. However, a comparison of the loss rates between National Guard units and other reserve component units did not show any advantage that could be attributed to the use of this sanctions, as the loss rates in some of the other components were lower than the National Guard.

Alternative Approaches

The simplest option may be to discharge all nonparticipants without prior service and those with prior active service who have no remaining military service obligation. Reservists with prior active service and a remaining obligation could be transferred to the IRR. This would emphasize the voluntary nature of reserve service and remove unreliable personnel from the Selected Reserve, while the experience of prior active service personnel would still be available in case of emergency. However, it might also reduce the utility of the IRR as a source of manpower in the event of mobilization.

Another alternative suggested by reserve officials would be to transfer nonparticipants to the IRR with an automatic reduction to the lowest enlisted grade and either bar them from returning to the Selected Reserve or order them to active duty for annual training each year with their own or other reserve units. This could be continued until they completed their military service obligation or term of enlistment. The disadvantage of this approach would be that the unit might have to cope with a recalcitrant individual during annual training.

Conclusions

Managing attrition in the Selected Reserve is complicated by the reserve environment. We believe that the reserve components are aware of the seriousness of the problems facing them and are taking actions to solve them, such as using recruiting and retention bonuses, establishing age and service limits to reduce grade stagnation, and instituting transfer programs for relocating reservists. However, some programs need to be improved.

Enlistment and reenlistment bonuses can affect retention, but some modifications could probably increase their effectiveness. For example,

paying bonuses in monthly installments with a yearly completion payment might make them a more effective retention device. In addition, implementing bonuses on a unit rather than on a force basis might be more effective because of the unit orientation of the reserve component structure.

The opportunity for a reservist to serve more than 20 years in the Selected Reserve needs to be balanced against the need to reduce grade stagnation and ensure a flow of new personnel into the higher ranks. High year tenure programs might improve promotion opportunities and reduce grade stagnation through the establishment of age and service limitations for reservists.

Existing relocation programs do not have established procedures to locate vacant positions in other components and coordinate transfers between guard and reserve units. Also, neither the Naval nor the Marine Corps Reserve has a program to assist reservists who relocate their residences in finding new unit assignments.

Finally, DOD does not have a uniform policy covering the disposition and actions against nonparticipants. Retaining nonparticipants on unit rolls for excessive periods of time or allowing them to return to units because of pressures to maintain unit strengths is likely to affect the morale of the reservists who attend drills as required. Requiring nonparticipants to attend annual training or imposing automatic reductions in grade might be viable alternatives, but their effectiveness depends on enforcement. If enforcement is not practical, then it might be better to acknowledge that service in the Selected Reserve is strictly voluntary and the best alternative may be to discharge nonprior service personnel and transfer prior service personnel to the IRR.

Recommendations

We recommend that the Secretary of Defense

- test a revised enlistment/reenlistment bonus program for reservists and National Guard members to shift bonus payments to monthly installments, with special bonuses for completion of each year of added satisfactory participation;
- direct the Secretaries of the Army and Air Force to establish procedures that will identify vacant positions in other National Guard and reserve components when no position exists in the reservist's own component;

- direct the Secretary of the Navy to establish a relocation program to assist relocating reservists to find unit positions near their new place of residence; and
- develop a uniform policy for dealing with nonparticipating reservists that recognizes that reservists are part-time volunteers and provides for standard disposition procedures.

Agency Comments and Our Evaluation

DOD concurred with our recommendation to test a revised bonus program and indicated that a legislative proposal to revise bonus authorities to allow for the recommended type of test is being developed. DOD indicated that it would develop a legislative proposal to allow the recommended type of test program. According to DOD, the proposal should be in coordination within the executive branch by the end of fiscal year 1991.

DOD agreed with our recommendation to establish a uniform policy for dealing with nonparticipating reservists. It stated that it is currently revising DOD regulations to incorporate them into a single directive covering participation policies and procedures, to establish criteria and requirements for satisfactory participation and identify actions to be taken when participation is unsatisfactory. DOD further stated that an evaluation of the effect of activation of reserve units and members in support of Operation Desert Shield on service in the Selected Reserve and on patterns of attrition will have a significant impact on the revision of regulations. DOD expects a revised DOD directive to be implemented by the end of fiscal year 1991.

DOD partially concurred with our recommendations regarding programs to assist relocating reservists in finding new unit positions. DOD stated that while a system such as that we recommended would be desirable, it was not feasible in the reserve components of the Army because of automation limitations and, in the case of the Navy and the Marine Corps, other automation needs were more urgent. We believe that the establishment of formal relocation programs, whether automated or not, has the potential to reduce the number of relocating reservists that are lost from the Selected Reserve each year.

Sources and Applications of Electronic Data

Service Data

The Department of the Army provided us with loss data for Army National Guard and Army Reserve units. To supplement the individual data of transfers to the Individual Ready Reserve (IRR) provided by the Defense Manpower Data Center (DMDC), the Army also gave us data on individual transfers from Army National Guard units in fiscal year 1988. The data included military identification number, pay grade, primary military specialties, prior active service, and variables allowing us to calculate the individual's time in the service and reserve component. These data were combined with DMDC's data on individual transfers to the IRR to provide the information about military specialties and prior service personnel presented in appendix II. All services provided unit-level data consisting of unit identity code, unit designation, and assigned strength.

1986 Reserve Components Survey Data

DOD's Reserve Components Survey was administered to a sample of 60,000 guard and reserve members. The resulting data include previous active and reserve component as well as civilian background information for enlisted personnel and officers.

To assess factors related to attrition, DMDC linked the individual records in the survey with both the 1987 and 1988 reserve and active service personnel files. For each of these years, it appended variables relating to the individual's active or reserve component status and the appropriate loss transaction code (when an individual was no longer affiliated with the service) to the survey.

Reserve Component Common Personnel Data System

Data from DMDC's Reserve Component Common Personnel Data System serve as the basis for several assessments of fiscal year 1988 attrition. Each set of data provided service breakdowns of losses. DMDC provided strength data for each service component on enlisted personnel, warrant officers, and officers for fiscal year 1988. The unit designation and address were also included.

DMDC subsequently provided a second tape for our unit-level analysis that included service component, unit assignments, previous active service, pay grade, gender, and loss type for fiscal year 1988.

DMDC also constructed an individual level data set on computer tape, consisting of selected variables associated with individuals who transferred from the Selected Reserve to the IRR in fiscal year 1988. The variables were name, military identification numbers, unit identity code, pay

grade, primary military specialty, secondary military specialties, service, and a marker identifying the individual's prior active service or lack thereof. These data are restricted to the Army Reserve, the Navy Reserve, the Marine Corps Reserve, and the Air Force Reserve.

Data Problems

Initially, we intended to build a comprehensive file using all three data sets provided by DMDC to analyze unit attrition. However, the unit data provided in the first two tapes had a number of inconsistencies, such as different addresses for a single unit as shown in table I.1.

Table I.1: Comparison of Two Defense Manpower Data Center Tapes

Category	Number	Percent
Units present on tape 1 absent from tape 2	2,853	12.6
Units present on tape 2 absent from tape 1	9,622	42.5
Units present on tape 1 and tape 2	10,174	44.9

We attempted to systematically compare DOD's unit data to the services' data and found a number of serious discrepancies. In particular, unit designations, assigned strength, and losses were provided by the services but were absent from the DMDC data. Table I.2 shows the number and proportion of instances where a unit provided by the service had both assigned strength and losses present in the DOD data.

Table I.2: Comparison of DOD and Service Unit Data

	Complete cases		
Service	Number	Percent	Total
Army National Guard	3,627	62.5	5,806
Army Reserve	2,736	59.0	4,638
Air National Guard	1,122	87.0	1,290
Air Force Reserve	454	84.4	538
Marine Corps Reserve	65	81.2	80
Naval Reserve	1,778	45.6	3,898

Despite these problems, we were able to combine these data with service data to construct a data set. The construction of the unit data set is discussed in appendix II.

When we aggregated these data to the unit level, we found large differences in total losses and in loss categories when compared to the data published in the Official Guard and Reserve Manpower Strength and

Statistics, FY 1988 Summary. The discrepancies were particularly significant in the Naval Reserve. Only the total losses for the Air National Guard were approximately the same in both sources. The DMDC tape accounts for approximately 71 percent of losses in the reserve components.

Table I.3: Comparison of Total Losses

Component	Fiscal Year 1998 Summary	DMDC tape 2
ARNG	75,440	52,595
USAR	77,119	56,526
USNR	35,061	20,013
USMCR	11,325	8,232
ANG	10,747	10,607
USAFR	11,217	9,026
Total	**220,909**	**156,999**

We compared losses in the four major categories: discharges, transfers to the IRR, the active components, and other reserve components. All categories, except transfers to the IRR show major differences between the two sources.

Table I.4: Comparison of Losses by Category

Loss category	Fiscal Year 1988 Summary	DMDC tape 2
Discharge	69,604	47,056
To IRR	68,474	66,249
To active service	13,469	10,242
To other reserve	39,017	12,214

We also compared these data with Army National Guard unit loss data provided by the Department of the Army. We expected that DMDC's unit loss data would be generally higher than the Army's data, since Army losses included only drilling reservists; however, we found the opposite to be true. Table I.5 shows the distribution of loss ratios.

Table I.5: Comparison of DMDC and Army Unit Data

Ratio of Army to DMDC Loss Rate	Percentage of units
Less than .9	11
.9 - 1.1	11
.8 - 1.2	20
Greater than 1.2	68

The DMDC unit loss rate was within a range of 20 percent of the Army unit loss rate for only 20 percent of Army National Guard units. Unit loss rates according to Army data were higher for 68 percent of the units. The DMDC unit loss data showed about 66 percent of the losses reported in the Army data, although the unit strength data was approximately 93 percent accurate.

As an additional check, we compared the DMDC unit loss data with data obtained during our unit visits to determine the extent of errors. Since the units visited were judgmentally selected, differences in strengths and losses are only an indication of the types of errors. This check confirmed about the same magnitude of error in Army National Guard units. In the other reserve components, total unit losses did not correspond with unit data and, in most cases, loss categories, such as discharges and transfers to the IRR were not at all similar. This was also the case in Air National Guard units, even though total losses were generally similar. Finally, in several cases, there was simply no loss data, especially Naval Reserve commissioned units, such as ships and flying units.

The data differences encountered in these comparisons has caused some serious concerns on our part about the overall validity of data in the Reserve Component Common Personnel Data System. Although we expected some differences between service and DOD loss data, we were surprised by the magnitude of those differences. Therefore, we concluded that the data provided by DMDC was unusable for a unit loss analysis as we initially intended. We have assumed that the total losses contained in the Official Guard and Reserve Manpower Strength and Statistics, FY 1988 Summary are generally correct, but we are skeptical about the accuracy of loss information by loss categories, such as discharges and transfers.

Data Analysis

Unit Loss Analysis

DMDC provided a set of unit and strength data and a set of unit loss data. These data sets were combined to form a DOD unit file. We merged the DOD and service unit files to form a single unit file for each component. We sorted the unit file by location and unit identity code to align units with their parent headquarters, such as companies with their respective battalions and Naval Reserve noncommissioned units with their respective readiness centers. The aggregated losses from the unit file are shown by type of loss in table II.1 and by prior service status in table II.2.

Table II.1: Unit Losses in Fiscal Year 1988

Type loss	ARNG	USAR	USNR	USMCR	USAFR	ANG
Discharge	22,908	11,028	4,975	351	2,296	5,498
To IRR/ING[a]	18,212	29,250	12,597	2,152	4,038	0
To other reserves	2,885	5,179	55	18	954	3,123
To active	1,880	4,789	1,641	1,090	842	0
Other	6,710	6,280	745	4,621	896	1,986
Total	**52,595**	**56,526**	**20,013**	**8,232**	**9,026**	**10,607**

[a]Inactive National Guard

Table II.2: Losses by Prior Service Status

Component	Nonprior service	Prior reserve service	Prior active service
ARNG	38,946	1,563	12,086
USAR	31,984	1,785	22,757
USNR	7,252	497	12,264
USMCR	6,646	86	1,500
USAFR	4,252	302	4,472
ANG	7,021	401	3,185
Total	**96,101**	**4,634**	**56,264**

Transfers to the IRR

Transfers to the IRR make up the highest single category of losses in the Selected Reserve and consist of a high proportion of nonparticipants. For this reason, we decided to examine IRR transfers by selected military specialties to determine if there were differences in loss patterns by type of specialty. We also examined the prior service status to determine what percentage of transfers to the IRR were nonprior service reservists.

Military Occupational Specialty

We compared losses to the IRR across services for selected military occupational specialties (see table II.3). These were selected based on the expectation that some kinds of occupational specialties were likely to have higher loss rates than others. For example, the services generally have a problem retaining medical care personnel.

An examination of the data shows remarkable consistency across services (with the exception of the Army National Guard) within a specialty. The discrepancy within the Army National Guard may be explained by different regulations within the Guard. An alternative explanation is that the Guard data were provided by the Department of the Army while the data on the other services were provided by DOD (see app. I).

Table II.3: Transfers to the IRR by Specialties

Figures in percent

Occupational code	Army National Guard	Army Reserve	Naval Reserve	Marine Corps Reserve	Air Force Reserve
010 Infantry	4.3	15.4	[a]	17.6	[a]
041 Artillery & gunnery	6.7	24.4	22.6	12.4	[a]
101 Radio communications	[a]	[a]	[a]	[a]	30.1
300 Medical care & treatment	4.2	12.9	13.9	[a]	13.6
551 Supply administration	6.1	21.2	15.1	14.5	18.4
600 Aircraft, general	[a]	[a]	[a]	[a]	7.1
601 Aircraft engines	22.6	5.2	5.5	5.2	2.7
602 Aircraft accessories	[a]	[a]	[a]	[a]	6.9

Note: These data were provided by DMDC and the Department of the Army. Appendix I contains a complete discussion of data sources and their possible impact on the values presented.

[a]Not applicable

Contrary to expectations, medical care and treatment personnel do not show exceptionally high loss rates in the reserve components: it is generally 13 or 14 percent. Although personnel involved in aircraft-related specialties have lower loss rates, from about 3 to 7 percent, other occupational specialties have consistently higher rates. In particular, the artillery and gunnery specialty ranges from 12 to 24 percent in the reserve components, and radio communications is about 30 percent. Generally, the Army National Guard shows lower loss rates for all selected occupational specialties (from 4 to 7 percent), except aircraft engines (about 23 percent).

The Effect of Prior Service

A higher proportion (79 percent) of enlisted personnel in the lowest grades with no prior service transferred to the IRR than did those with prior active military service. Generally, the lower enlisted pay grades showed the highest proportional transfers to the IRR of nonprior service personnel. Only 5 percent of those in pay grades E8 and E9 transferring to the IRR had no prior active service.

Table II.4: Nonprior Service Transfers to the IRR by Grade

Figures in percent

Grade	Air Force Reserve	Army National Guard	Army Reserve	Marine Corps Reserve	Naval Reserve	Total
E1-E3	71	96	87	53	53	79
E4-E5	14	84	51	23	23	39
E6-E7	0	58	2	0	9	10
E8-E9	0	63	0	0	0	5
Total	**18**	**89**	**58**	**27**	**28**	**48**

In pay grades E1 through E3, 96 percent of Army National Guard and 87 percent of the Army Reserve personnel transferring to the IRR in fiscal year 1988 had no prior active military service. For the same pay grades, only 53 percent of those transferring to the IRR from the Marine Corps or Navy Reserve had no prior service. In contrast, those members who transferred to the IRR from the Air Force Reserve or Marine Corps Reserve in pay grades E6 through E9 all had prior active service.

Army National Guard and Reserve Unit Analysis

The Army provided data on total losses and losses in selected types of discharges and transfers to the IRR. This information was aggregated by unit identity codes, which are used to identify units for mobilization purposes. Losses were subdivided into three personnel categories describing military experience.

1. Nonprior Service—Personnel with no previous military service.

2. Prior Service $<$ 23—Personnel with less than 23 months of active service.

3. Prior Service $\geq$ 23—Personnel with 23 or more months of active service.

We judgmentally selected nine loss transaction codes covering discharges and transfers to the IRR. The loss codes are two character codes

used by the Army to indicate the reason a member is a loss. We placed these losses in four descriptive groups.

1. Group A—Discharges for conduct, aptitude, inefficiency, unsuitability, and failure to complete required training.

2. Group B—Discharges for failure to reply to correspondence and not locatable.

3. Group C—Transfers to the IRR for nonparticipation or in lieu of discharge.

4. Group D—Transfers to the IRR for relocation or failing to report to new unit.

These loss codes describe types of losses that are manageable to the extent that they can be affected by actions of the unit leadership. By using these codes, we could clearly identify the type of losses, such as transfers to the IRR for nonparticipation, and examine the types of losses occurring in units.

Table II.5: Unit Losses

Type of loss	ARNG	USAR
Discharges		
Group A	1,890	91
Group B	115	151
Transfers to IRR		
Group C	15,610	21,478
Group D	4,876	188
Total	**22,491**	**21,908**
Total losses	79,719	78,779

As shown in table II.5, the majority of manageable losses consisted of those transferred to the IRR for nonparticipation, 69 and 98 percent for the Army National Guard and Army Reserve, respectively. We also noted the high proportion of Army National Guard losses to the IRR because an individual relocated, as compared to the relatively small number of Army Reserve losses for that reason. The implication is that Army reservists who relocate are more easily assigned to a new unit and may well reflect the effectiveness of the Army Reserve's transfer program.

Establishing High Unit Loss Rate Criterion

We developed the frequency distribution of unit losses in both the Army National Guard and Reserves to determine high unit loss levels. Based on the unit loss rate frequency distribution, we selected the 75th percentile as the criterion to determine high unit loss rates. Under this criterion, units in the Army National Guard with loss rates of 23 percent or higher were defined as high loss units. Unit loss rates were appreciably higher in the Army Reserve, with a high unit loss rate identified as 42 percent, which is almost twice the high loss criterion of National Guard units. Only 31 percent of Army Reserve units had loss rates of 23 percent or less, and 51 percent of the units had loss rates above 30 percent. Only 8 percent of National Guard units had loss rates above 30 percent.

Manageable Loss Rates

We also examined the distribution of a subset of total losses, which included transfers to the IRR and discharges. We selected nine loss codes that identified reservists discharged for misconduct, inaptitude, failure to complete training, etc., and those transferred to the IRR for nonparticipation or because they relocated. These types of losses are representative of manageable losses because they can often be affected by reserve component leadership.

The results of this analysis are shown in figure 2.5. Army Reserve units have a lower manageable loss rate than Army National Guard units. This means that although the Army Reserve has higher unit loss rates, more unit losses are due to reasons beyond unit control, such as medical discharges or transfers to other components.

Effects of Unit Location on Loss Rates

We examined two aspects of unit geographical location to determine if they affected unit loss rates: location on or near active military installations and dispersion of parent and subunits. Proximity to active military installations offers certain advantages, such as access to training areas and maintenance facilities as well as post exchanges and commissaries, which reservists are able to use on a limited basis. We used zip codes to determine proximity to military bases by merging a military zip file with the unit file. An exact 5-digit match indicated that units were on military bases and a 3-digit match indicated that units were near military bases. Slightly more than one-third of the units are located on or near active military bases.

Table II.6: Location of Army National Guard and Army Reserve Units

Figures in percent

	USAR	ARNG
On military base	11	6
Near military base	24	28
All others	65	68

Note: Does not add due to rounding.

We compared unit loss rates by location and found that there was only a slight difference for Army Reserve units and no difference for Army National Guard units.

Table II.7: Unit Loss Rates Based on Proximity to Military Bases

Figures in percent

	USAR	ARNG
On military base	34	19
Near military base	34	19
All others	33	19

Since the location of units in the reserve components is often dictated by demographic considerations, we examined the effects of dispersion of parent and subunits. Dispersion can either consist of separating headquarters and defined subordinate elements of battalion-type units or separating companies into detachments at different locations. To examine the effects of dispersion on unit loss rates, we identified units that consisted of parent units with one or more subunits and used a 5-digit zip code to determine if units were collocated. Dispersion of units does not appear to affect unit loss rates. As shown in table II.8, there was almost no difference between the percentage of Army Reserve high loss units in either category. However, there were differences in the Army National Guard as there was a lower percentage of dispersed units in the high loss unit category.

Table II.8: Percentage of High Loss Units

Figures in percent

Collocated units		Dispersed units	
USAR	ARNG	USAR	ARNG
25.4	33.8	25.8	22.4

Effects of Unit Size on Loss Rates

The Army National Guard and Reserve are comprised of many separate companies and detachments. Approximately 75 percent of Army Reserve units have enlisted strengths of 134 or less and 50 percent of Army National Guard units have strengths of 131 or less. For this reason, we examined the distribution of units by size and loss rates to determine if the size of units had any effects on loss rates. We found that smaller units made up larger proportions of high loss units in both components. Approximately 32 percent of the smallest Army Reserve units were classed as high loss units as opposed to only 21 percent of the largest units. However, the disparity was not as pronounced in the Army National Guard as there was only a 2-percent differential between the number of small and large units.

Reserve Component Losses by State

The aggregated losses for the individual reserve components are shown by state in table II.9. The information is based on loss and strength data contained in the Official Guard and Reserve Manpower, Strength and Statistics, FY 1988 Summary.

Table II.9: Fiscal Year 1988 Loss Percentages

Figures in percent

State/territory	ARNG	USAR	USNR	USMCR	ANG	USAFR	DOD
Alabama	16	15	9	11	9	6	14
Alaska	13	17	12	10	13	6	13
Arizona	25	15	17	7	9	6	17
Arkansas	16	19	10	11	8	10	15
California	21	19	10	12	17	6	15
Colorado	20	29	10	7	13	8	18
Connecticut	23	29	8	22	12	[a]	22
Delaware	19	27	14	13	13	6	15
Washington, D.C.	17	28	8	9	18	[a]	13
Florida	19	20	10	10	13	6	15
Georgia	18	17	7	11	12	4	14
Guam	7	12	a	a	a	2	8
Hawaii	13	16	7	16	8	7	12
Idaho	20	25	14	9	11	17	18
Illinois	22	19	9	18	9	6	17
Indiana	18	23	12	15	9	8	17
Iowa	20	21	6	10	9	[a]	17
Kansas	18	20	12	3	8	4	15
Kentucky	21	18	12	10	12	[a]	18
Louisiana	17	19	24	15	10	7	17
Maine	20	27	8	11	9	[a]	17
Maryland	18	24	9	10	12	7	18
Massachusetts	22	31	8	11	13	5	19
Michigan	18	23	10	19	11	6	17
Minnesota	17	22	10	11	10	4	16
Mississippi	13	13	18	14	9	5	12
Missouri	18	20	10	24	10	6	17
Montana	26	25	6	24	9	11	21
Nebraska	15	16	7	13	9	7	13
Nevada	29	17	18	14	12	[a]	19
New Hampshire	17	28	17	12	10	32	18
New Jersey	16	34	14	9	11	7	18
New Mexico	21	19	12	6	11	10	18
New York	25	26	11	13	8	5	21
North Carolina	15	17	11	10	9	3	14
North Dakota	13	15	6	[a]	7	3	12
Ohio	19	19	13	15	9	5	16
Oklahoma	23	21	13	9	12	8	19
Oregon	21	20	11	10	14	5	17

(continued)

State/territory	ARNG	USAR	USNR	USMCR	ANG	USAFR	DOD
Pennsylvania	17	25	9	14	11	4	17
Puerto Rico	7	13	[a]	16	[a]	[a]	9
Rhode Island	20	30	6	12	11	[a]	17
South Carolina	12	13	8	15	8	5	11
South Dakota	13	15	6	[a]	6	13	12
Tennessee	16	17	9	13	10	[a]	15
Texas	22	20	10	10	13	6	17
Utah	20	22	8	14	11	5	16
Vermont	16	31	11	[a]	12	[a]	17
Virgin Islands	11	[a]	[a]	[a]	[a]	[a]	11
Virginia	19	20	9	12	10	5	16
Washington	25	18	10	8	13	7	16
West Virginia	21	24	11	13	9	[a]	19
Wisconsin	20	17	9	18	11	4	16
Wyoming	19	35	10	[a]	9	7	16

[a]This component has no units.

Army National Guard and Reserve State Loss Rates

The comparisons of state unit loss rates and the percentage of units in the state that are classed as high loss units are shown in tables II.10 and II.11. We used loss rates greater than 23 percent, which was the loss rate for the 75th percentile of Army National Guard Units, as the criterion for high loss units to compare Army National Guard and Army Reserve units by state. These tables help to depict the importance of unit loss rates as measures of attrition because they provide a sense of what the overall loss rates means in terms of units and the extent of attrition problems.

Table II.10: Army Reserve High Loss Units

Figures in percent

State/territory	State loss rate	High loss units
Alabama	31	100
Alaska	23	27
Arizona	27	51
Arkansas	31	68
California	35	71
Colorado	43	67
Connecticut	44	84
Delaware	48	71
Washington, D.C.	41	83
Florida	33	56
Georgia	26	52
Guam	16	0
Hawaii	29	62
Idaho	37	50
Illinois	33	61
Indiana	38	73
Iowa	32	65
Kansas	32	70
Kentucky	27	50
Louisiana	27	45
Maine	44	100
Maryland	38	77
Massachusetts	49	68
Michigan	36	79
Minnesota	33	55
Mississippi	19	25
Missouri	31	55
Montana	36	93
Nebraska	26	38
Nevada	54	100
New Hampshire	43	89
New Jersey	55	79
New Mexico	31	67
New York	39	73
North Carolina	26	42
North Dakota	18	22
Ohio	30	50
Oklahoma	31	60
Oregon	35	100

(continued)

State/territory	State loss rate	High loss units
Pennsylvania	40	69
Puerto Rico	18	33
Rhode Island	43	80
South Carolina	22	43
South Dakota	20	33
Tennessee	24	39
Texas	32	64
Utah	33	72
Vermont	43	80
Virginia	31	63
Washington	30	69
West Virginia	34	72
Wisconsin	27	58
Wyoming	40	100

Table II.11: Army National Guard High Loss Units

Figures in percent

State/territory units	State loss rate	High loss
Alabama	17	8
Alaska	14	23
Arizona	27	58
Arkansas	16	11
California	22	28
Colorado	22	40
Connecticut	22	26
Delaware	20	23
Washington, D.C.	18	43
Florida	20	25
Georgia	19	20
Guam	22	43
Hawaii	13	6
Idaho	20	35
Illinois	22	41
Indiana	19	27
Iowa	19	23
Kansas	20	22
Kentucky	21	41
Louisiana	18	13
Maine	18	7
Maryland	19	15
Massachusetts	20	30
Michigan	18	16
Minnesota	18	16
Mississippi	14	2
Missouri	18	22
Montana	6	17
Nebraska	16	7
Nevada	29	62
New Hampshire	17	21
New Jersey	17	5
New Mexico	21	35
New York	25	53
North Carolina	16	15
North Dakota	14	8
Ohio	20	19
Oklahoma	23	41
Oregon	22	40

(continued)

State/territory units	State loss rate	High loss
Pennsylvania	18	17
Rhode Island	20	30
Puerto Rico	14	5
South Carolina	12	2
South Dakota	13	15
Tennessee	16	12
Texas	23	42
Utah	20	39
Vermont	17	18
Virginia	21	24
Virgin Island	15	16
Washington	26	38
West Virginia	23	41
Wisconsin	19	19
Wyoming	20	36

Analysis of the 1986 Reserve Components Survey Data Base

This appendix describes our analysis and provides a technical description of the logit model, the variables examined, and the results. The results have been summarized in chapter 3.

The Sample

This analysis evaluated the incidence and causes of attrition from the reserve components. Reserve attrition does not have a consistent, uniform definition across the previous research. Individuals may leave a unit for a number of reasons, including transfers within the components, movement to active service, or separation from the military. The loss may occur before or after the existing commitment has been successfully completed. We defined attrition as manageable losses from the Selected Reserve before the end of the term of enlistment.

The data are from the 1986 Reserve Components Survey, a comprehensive sample of over 60,000 selected reservists, administered by the Defense Manpower Data Center. The data set contains both reserve and civilian background information for officers and enlisted service members.

A primary goal of this evaluation was to identify the actual incidence of reserve attrition among the survey population. The survey was linked, at our request, by the Defense Manpower Data Center with the 1987 and 1988 reserve and active service personnel files to facilitate this task. To be included in the survey, the individual had to have been in the Selected Reserve in 1986 when the survey was administered. Using the 1987 and 1988 military personnel files, we tracked the subsequent status for each of the sample respondents, including the decision to leave the military. We did not include losses that were not included in the definition of attrition (e.g., death, retirement, or the failure to reenlist). This allowed us to directly compare the attrition group and those individuals with continuous military service.

We restricted the sample to enlisted personnel only, and did not include military technicians and active guard reservists. The Coast Guard Reserve is also not included, the sample being restricted to the six remaining reserve components (Army National Guard, Army Reserve, Air National Guard, Air Force Reserve, Naval Reserve, and Marine Corps Reserve). Respondents who were defined as being out of the civilian labor force or who were unpaid household workers were not included in the sample. Individuals who left the military in 1987 but who returned by 1988 were also dropped from the analysis.

After excluding these groups, our final sample consisted of 28,009 reservists, including 1,064 incidences of observed attrition between 1986 and 1987 (3.8 percent of the sample).[1] Actual incidence of attrition is a better measure than reliance on individual intentions. Of those in the attrition category, 67 percent indicated that at the time of the survey they planned to remain in their current status the following year. Of the individuals who planned to leave the military, only 16 percent did so. The two statistics demonstrate substantial divergence between an individual's immediate plans and his or her actual future behavior.

The Logit Model

The goal of the analysis was to relate the incidence of reserve attrition to the various military, civilian, and demographic characteristics of reservists. The dependent variable (observed attrition) has two possible values: 1 if the individual is identified as a member of the attrition group, or 0 if the individual continuously stayed in the reserves. The discrete nature of the dependent variable precludes the use of a statistical method that requires the dependent variable to be continuously distributed, such as ordinary least squares. Therefore, we analyzed the attrition incidence equation by the logistic function:

$$\text{Attrition} = [1 + \exp(-\mathbf{x'b})]^{-1}$$

This is a maximum likelihood estimator technique, with **x** representing the vector of explanatory variables and **b** the vector of logit coefficients to be estimated. The raw coefficients were transformed to convey the change in the probability of attrition from a unit change in a given explanatory variable. The transformation differs for continuous versus discrete explanatory variables.[2] For continuous explanatory variables we used:

[1]This value is considerably smaller than previous estimates of attrition for several reasons: (1) previous studies maintained more expansive definitions of attrition than this study, (2) the initial data set was restricted to selected reservists who had already completed their initial training, eliminating the high attrition which is observed in the first year of a reservist's commitment, (3) the questionnaire was administered as part of a weekend drill period, individuals not attending drill (and likely to be a future attrition) were not included in the sample, and (4) most studies of the reserve components utilize the Reserve Components Common Personnel Data System files, which are restricted to new entrants. The Reserve Component Survey sample, by contrast, was composed of reservists with various lengths of service within the reserve components, approximately half of the sample having already completed their initial reserve enlistment. The survey, therefore, contains many individuals with a very strong commitment to the reserves.

[2]The proof and explanation of the two different transformation methods is discussed in Gunderson, Morley et. al, "Logit Estimates of Strike Incidence from Canadian Contract Data," Journal Of Labor Economics, Vol. IV, (1986) pp. 257-276.

Transformation #1 = $P(1-P)\mathbf{b}$

For discrete explanatory variables we used:

Transformation #2 = $[1 + \exp(-\mathbf{x'b} - b_i)]^{-1} - P$

In either transformation, P represents the probability of an attrition occurring, and is estimated by the average attrition rate for the various subgroups analyzed. The transformed coefficients are reported.

We estimated a logit attrition model with 30 explanatory variables, covering the military, civilian, and demographic characteristics relevant to our analysis.[3] The complete list with a brief description of each variable is given in table III.1.

Several variables require some additional clarification and explanation. The analysis includes a proxy for labor market experience (Exp). Experience was constructed from two other variables—age and education—and was equal to age minus education minus six. It thus represents the component of an individual's age, which immediately follows the period of time spent in school.[4]

We created three mutually exclusive designations of prior military service: prior active service (PAS), nonprior service (NPS), and prior reserve service (PRS). Individuals who served more than 1 year in the active service were designated as a prior active service member regardless of previous reserve experience.[5] The nonprior service group is composed of individuals in their initial reserve enlistment. The prior reserve service group (the control category) completed a minimum of 6 years of reserve service. The reserve experiences of these three categories of personnel were considered to be substantially different from each other. The results of the analysis indicate the importance of this distinction.

[3]This is the total number of explanatory variables after dropping the control group in each of the three dummy variable sets.

[4]This variable has been extensively used in labor market research serving a multitude of functions, including the proxying of labor market experience and the proximity to retirement. A limitation of the variable is the implicit assumption that labor market experience is continuous without interruption. This is generally true for men but not for women.

[5]Individuals with 1 year or less in active service are designated either nonprior service or prior reserve service, as appropriate.

The analysis includes information on the respondents' usual weekly earnings from his or her main civilian job in the previous calendar year (Wkearn). Individuals who reported positive weekly earnings, but no annual earnings over the same time period, were dropped. Values more than three standard deviations higher than the mean were also dropped. The maximum civilian earnings allowed was $1,641 a week. The behavior of such high earners are likely to be inconsistent with the vast majority of reservists.

The model includes information on the respondent's annual income received from the reserve components in the previous calendar year (Resaninc). The model also contains information on civilian labor force experience and military grade. An individual's earnings in the military are a function of both grade and tenure. Tenure, like experience, is closely associated with age. Reserve income would appear unnecessary in the model, once experience and grade are controlled for. However, reserve participation, unlike active participation, is variable. Individuals may contribute the minimum drill requirement (or less), or a substantially greater amount. Some or all of this increased participation will be compensated for. The reserve income variable controls for the variations in reserve income which are due to different levels of compensated participation.

Results and Findings

The Basic Model

Table III.2 shows the mean values of the explanatory variables for the basic sample.[6] Approximately 13 percent of the respondents reported a disparity between their primary military occupational specialty and

[6]A comparison between some sample characteristics and summary information of the reserves shows a general similarity between the two. The statistics compared were sex, education, grade, and component as of September 30, 1988. This is 2.5 years after the time of the survey and can account for some of the minor differences, especially in terms of component percentages. The one striking difference is in education, the sample being considerably more educated on average than the reserves as a whole. The incidence of attrition has been shown to fall with increases in education (RAND studies: 1986, 1988, and 1989). The factors that contributed to the low attrition rate of the sample are likely contributing to this high average in education.

their duty specialty (Mosdum), serving in an occupation which is very different from the one for which they are fully qualified.[7]

Individual respondents earn an average of $2,704 a year from the reserves and $394 a week from their main civilian jobs. An average of 15 percent report that they frequently lost opportunities for overtime pay from their civilian jobs due to reserve obligations (Lostopay), a potentially serious source of conflict for the reservist.

Table III.4 shows the multivariate logit results. The decision to participate in the reserves shares a number of similarities with the decision to "moonlight" (i.e., work a civilian part-time job in addition to one's full-time civilian job). According to the moonlighting model (see the 1981 RAND study for a full discussion), the probability of reserve attrition rises with an increase in civilian wages and hours and falls with increases in reserve compensation.[8] The individual must weigh the benefit of increased income versus the cost of decreased available leisure time.

Two variables related to civilian earnings are included in the logit model: the individual's estimate of his average weekly compensation at the time of the survey and a variable that identifies individuals who have frequently lost overtime pay due to their reserve obligation. The weekly earnings variable might be considered representative of wages, since we also control for civilian hours. However, a limitation of that variable is that it reflects only differences in civilian earnings across individuals who have already made the decision to join the reserves. Preferably, the relevance of the moonlighting model to reserve attrition would be tested using a multiyear panel data set, with periodic observations of civilian earnings, including the level at the initial entrance to the reserves. The effects of changes in civilian earnings on reserve attrition could then be determined.

[7]The analysis examined major skill mismatches, the differences being defined across eight broad occupational categories. The eight categories are (1) infantry, gun crews, and seamanship specialists, (2) electronic and electrical/mechanical equipment repairman, (3) communications, intelligence, other technical and allied specialists, (4) health care specialists, (5) functional support and administration, (6) craftsmen, (7) service and supply handlers, and (8) nonoccupational.

[8]The findings from a 1989 RAND study are consistent with some of the predictions of the moonlighting model, with the probability of attrition rising with increases in civilian pay and falling with increases in reserve compensation. RAND was unable to directly observe the civilian pay of reservists and relied instead on state level average compensation rates as a proxy. It also had no information on civilian hours worked.

Individuals who report that they frequently lost opportunities for overtime income are indicating a lost opportunity to work additional hours at their civilian job (perhaps at a higher wage rate). To the extent that this opportunity is greater than the situation that prevailed when the reservist first joined the reserves, his probability of attrition should rise. Unfortunately we are unable to observe the extent to which the variable represents changes from the initial situation.

Increases in weekly earnings show no discernable impact on the attrition probability of reservists. This does not necessarily contradict the moonlighting model's predictions given the absence of the reservist's entry-level civilian earnings. Rather, it demonstrates instead that relative civilian income level apparently does not matter, reservists with high civilian incomes having the same attrition probability as reservists with low civilian incomes.[9]

Individuals who report frequent lost overtime opportunities have a 1.4 percentage point greater probability of attrition, after holding all other factors constant. This represents a more than 35-percent increase in the attrition rate due to this factor.[10] The presence of this factor clearly increases the probability of attrition and is therefore a good indication that its magnitude exceeds the level prevailing when the individual first entered the reserves. The direction of effect is consistent with the predictions of the moonlighting model.

Increases in average weekly hours (Wkhr) significantly increase the probability of attrition, as predicted by the moonlighting model, but the effect is quite small.

Reserve compensation is a function of one's grade, military tenure, and frequency of participation. Grade is included directly in the model. Military tenure is related to labor market experience, which is included in the model as a proxy variable. The participation level is proxied by the reserve income variable. An increase in reserve participation represents

[9]One function of the weekly earnings variable in the model is to control for unmeasured productivity differences not attributed to observable human capital characteristics.

[10]For the purpose of this analysis a change in attrition probability refers to the percentage value of the logit coefficient. A change in attrition rate refers to a change in the mean value of attrition for that particular sample. In the previous example, loss of overtime pay (Lostopay) has a coefficient of .0139. This corresponds to an increased attrition probability of 1.4 percentage points, after holding constant the effects of the other explanatory variables. The simple mean attrition rate of the sample is 3.8 percent. An increase in this average by 1.4 percentage points (to 5.2 percent) represents a greater than 35 percent increase in the attrition rate (a 36.8 percent increase).

both an increase in income and hours by the reservist. The moonlighting model does not have a prediction on the effect of secondary hours on the decision to moonlight. We expect, however, that an increase in reserve hours will correspond with a decreased probability of attrition, indicating either a strong attachment to reserve service or a constraint on primary hours below the number an individual might choose to work.

According to the logit analysis, an increase in rank decreases the attrition probability by approximately .6 percentage points, decreasing the attrition rate by more than 16 percent. The reserve income variable is also negative and significant, although small, demonstrating that increased participation slightly decreases the probability of attrition.

Taken as a whole, the results confirm the moonlighting model's predictions, demonstrating that the trade-off between income and leisure is important to reservists. However, the moonlighting analogy is only useful in explaining a minor part of the attrition rate of reservists. The analysis now turns to an examination of the impact of reserve characteristics on the probability of attrition.

After holding the other variables constant, a mismatch between a reservist's primary military specialty and his or her duty specialty (Mosdum) increases the probability of attrition by more than 3 percentage points, representing a 90-percent increase in the attrition rate. This is the single most important determinant of attrition in the model. These are substantial skill mismatches, occurring across eight broad occupational categories, with, for example, an infantryman assigned to an administrative position. Such a mismatch could cause a reservist to become dissatisfied with the reserves since the individual is assigned to an occupation that is quite different from his or her qualifications or expectations.

Those with prior active service, after holding everything else constant, have a significantly greater attrition probability than the prior reserve service group. However, the nonprior service group has a significantly lower attrition probability than the prior reserve group. Table III.2 shows that the nonprior service group has the highest average attrition percentage, more than 2 percentage points greater than the prior reserve service group, with the prior active service percentage between the two. However, after including information on an individual's civilian job, reserve, and demographic characteristics, the nonprior service group has the lowest average attrition rate, and the prior active service

group the highest.[11] The greater attrition probability of the prior active service group when compared to the prior reserve service group confirms the 1989 RAND finding that the prior reserve service group would have more realistic assumptions about reserve service than individuals with active duty experience. The three reserve groups are examined in greater detail below.

Both the mean attrition (table III.3) and the multivariate results (table III.4) indicate that reserve attrition is substantially lower for the National Guard (both Army and Air) than for the four reserve forces. This is consistent with the 1988 RAND findings in their comparison between the Army National Guard and Reserve. The Marine Corps has the greatest attrition probability by a considerable degree. The six components are examined in greater detail below.

Table III.4 reveals that whites have a 1.5 percentage point greater probability of leaving the reserves than non-whites, representing a 39-percent increase in the attrition rate according to this characteristic. Individuals who are currently married (Mrdnow) have a .5 percentage point lower probability of leaving the reserves than those who are unmarried. The greater the individual's educational level, the lower his or her probability of attrition. Each year of education represents a .14 percentage point reduction, after holding the effect of the other variables constant. A college degree represents a 15-percent reduction in the attrition rate in comparison to a high school diploma only.

Employment in a white collar civilian occupation (WC) increases the probability of attrition by approximately .6 percentage points. Increases in the unemployment rate (Yrur) resulted in a small decline in the probability of attrition. Declining civilian job opportunities increased the desirability of reserve compensation during periods of economic recession.

Area variables (Area1-Area8) were included in the model to control for regional economic and reserve policy differences. After controlling for other factors, reservists from New England have the lowest probability of attrition. The other areas are not significantly different.[12]

[11] A test of the nonprior service group determined that the lower age and rank of the members of this group contributed greatly to their high attrition averages, with the control of those factors contributing to the results reported here.

[12] A test of the model using separate state variables did not reveal any useful information. Almost all of the coefficients were not significant.

A Comparison of the Three Service Groups

The mean comparisons across the three groups are reported in table III.2. The prior active service group tends to be the oldest, best educated one, and has the highest civilian earnings. It has the greatest incidence of military specialty mismatch and the lowest percentage of females, and its members are more likely to be in the Army, Navy, or Air Force Reserves than are members of the nonprior service and prior reserve service groups. The nonprior service sample has the highest average probability of enlistment bonus and the lowest average grade and reserve income. Nonprior service personnel are the youngest, with the highest percentage of females, lowest marriage probability, and the highest incidence of missed civilian overtime opportunity due to reserve obligation. The prior reserve service group has the highest average reserve income and the majority are members of the Army National Guard.

The logit results are shown in table III.5. Individuals defined as nonprior service are the most dynamic and responsive of the three groups we analyzed. Both bonuses and higher grade substantially increase the probability of nonprior service personnel staying in the reserves. The attrition probability of nonprior service reservists increases by more than 6 percentage points due to military specialty mismatches, representing a 130-percent increase in the attrition rate of this group. Lost civilian overtime pay opportunities increased the nonprior service attrition probability. These individuals are also the most responsive to the business cycle, reserve income increasing in importance for these individuals as civilian opportunities decrease. The predictions of the moonlighting model are most applicable to these reservists, with lost overtime pay and grade variables being very strong. This is in contrast to the prediction of the 1981 RAND study, which assumed that the demands of basic and advanced training would reduce the relevance of the moonlighting model for nonprior service reservists. The results indicate that the nonprior service group is highly responsive to civilian economic incentives and certain observed reserve policies.

The probability of attrition falls rapidly with experience for the prior active service group. Evaluating the two experience coefficients at the mean labor force experience value for this group (17.41 years) revealed that the group's probability of attrition is 2.7 percentage points lower than an individual who just entered the civilian labor force (experience equal to zero).[13]

[13]The calculation is $-.0024*17.41 + .0000498*(17.41^2) = -.027$. This function can be evaluated at a continuum of experience levels.

The prospect of a reserve pension is an important incentive for these reservists to continue their service. Reserve pensions are based on inactive and active duty participation during a year and the number of qualifying years attained. Each full year of active military service contributes a considerable amount to a reservist's future pension because it is the equivalent of the pension credit for 5 or 6 years of reserve service.

A military specialty mismatch substantially increases the attrition probability for the prior active service group, although it has a lesser effect than with the nonprior service group. Civilian employment incentives do not influence the prior active service group's attrition probability. Other factors being equal, whites and white collar workers leave with high frequency. The results for the prior reserve service group are noteworthy in that the majority of variables are weak and insignificant in the model. An important factor is the military specialty mismatch, which is a constant problem in the reserves, even for individuals who have already completed a minimum of one full term of service. Lost civilian overtime opportunity, grade, and membership in the Marine Corps are the only other variables of significance for this group.

A Comparison of the Six Reserve Components

The mean comparisons across the six components are shown in table III.3. The Marine Corps Reserve has the greatest probability of attrition. The Marine Corps Reserve sample has a high percentage of nonprior service members (65 percent). The nonprior service sample had the highest mean attrition probability, which is likely to be a significant contributor to the high Marine Corps Reserve percentage.[14] The incidence of military specialty mismatch is lowest in the Air Force (both Guard and Reserve) and highest in the Naval Reserve.

The logit results are reported in tables III.6 and III.7. Although the comparatively small sample sizes for most of the components diminish the significance of the results, some interesting findings do emerge. For example, military specialty mismatches are an important factor in determining the probability of attrition for the six reserve components. A comparison between the Army and Air Force guards and reserves demonstrates that military specialty mismatches have a far greater effect in the reserves than in the guards. The relative increase in the attrition

[14]The Marine Corps Reserve logit results are similar to the nonprior service findings discussed previously, and are due to the high percentage of nonprior service individuals in the Marine Corps. The basic model was tested without the Marines, to test its robustness. Some variables became less significant, but all of the conclusions remained basically the same.

rate is 3.0 times greater in the Army Reserve than in the Army National Guard, and 2.1 times greater for the Air Force Reserve than the Air National Guard. Although the two Air Force components have the lowest incidence of military specialty mismatch it does have a strong impact on attrition, doubling the attrition rate of the Air Force Reserve for example.

The results of the basic model did not identify a significant attrition difference based on gender. However, the female attrition probability differs greatly between the guards and reserves. Woman had a 3.2 percentage point greater probability of attrition than men in the Army National Guard, and a 2.3 percentage point greater probability in the Air National Guard. This represents a 117-percent increase in the attrition rate of the Army National Guard and a 93-percent increase in the Air National Guard attrition rate. By contrast, gender is not a significant attrition factor in any of the four reserve components.

Conclusions

The results confirm the predictions of the moonlighting model, demonstrating that the trade-off between income and leisure is important to reservists. However, the moonlighting analogy only helps explain a minor part of the reserve attrition rate.

A mismatch between a reservist's primary military occupational specialty and his duty specialty is the single most important determinant of attrition, almost doubling the attrition rate for reservists with this factor. The analysis focused on substantial occupational mismatches across eight broad occupational categories.

Whites are found to have a greater probability of attrition than nonwhites. The attrition probability decreases with increases in education as well as periods of high unemployment. The age or gender of a reservist does not significantly affect the attrition rate.

A comparison of the prior active service, nonprior service, and prior reserve service groups shows that individuals in the nonprior service group are the most responsive to civilian economic incentives and reserve policies such as bonuses and increased grade. The attrition probability for the prior active service group falls rapidly with labor market experience, due to the prospect of qualifying for a reserve pension. The prior reserve service group is generally stable, with a low attrition probability and few identifiable factors contributing to their decision to leave.

In the comparisons of the six reserve components, the Army and Air National Guards are different from the reserve components in two important ways. First, the incidence of military specialty mismatch has a far stronger effect in the reserves than in the guards, and is a likely contributor to the higher average attrition rates experienced by the reserve forces. Second, although gender did not affect the average attrition probability of the full sample, it is an important contributor to the attrition profile of the two guard components.

Table III.1: A Description of the Variables Utilized

Variable	Description
Pastbon	Equals 1 if the respondent received a bonus at the time of his enlistment or most recent reenlistment.
Lostopay	Equals 1 if the respondent frequently lost opportunities for overtime pay due to the Reserve obligations.
Mosdum	Equals 1 if the primary military occupational specialty is not equal to the duty specialty.
WC	Equals 1 if the respondents civilian occupation is classified as white collar.
Yrur	1986 state civilian unemployment rate
Area1	New England States
Area2	Middle Atlantic States
Area3	East North Central States
Area4	West North Central States
Area5	South Atlantic States
Area6	East South Central States (Control Group)
Area7	West South Central States
Area8	Mountain States
Area9	Pacific States
PAS	Equals 1 if the respondent is defined as prior active service.
NPS	Equals 1 if the respondent is defined as nonprior service.
PRS	Equals 1 if the respondent is defined as prior reserve service (Control Group).
Educ	Respondent's years of education.
Exp	Respondent's years of labor force experience.
Exp2	The square of labor force experience.
Female	Equals 1 if the respondent is a female.
White	Equals 1 if the respondent is white.
Mrdnow	Equals 1 if the respondent is currently married.
Grade	Respondents military pay grade
ARNG	Equals 1 if the respondent is a member of the Army National Guard.
USAR	Equals 1 if the respondent is a member of the Army Reserve.
USNR	Equals 1 if the respondent is a member of the Navy Reserve (Control Group).
USMCR	Equals 1 if the respondent is a member of the Marine Corps Reserve.
ANG	Equals 1 if the respondent is a member of the Air National Guard.
USAFR	Equals 1 if the respondent is a member of the Air Force Reserve.
Resaninc	1985 annual income received from the reserves.
Wkearn	1985 usual weekly earnings from the respondents main civilian job.
Wkhr	1985 usual hours per week worked on the respondents main civilian job.

Table III.2: Means of the Basic, Prior Active Service, Nonprior Service, and Prior Reserve Service Samples

Figures in percent

Variable	Basic	PAS	NPS	PRS
Attrition	3.80	3.92	4.70	2.50
Pastbon	31.85	22.76	48.26	34.53
Lostopay	14.85	13.75	18.11	13.73
Mosdum	12.98	15.51	10.36	10.02
WC	31.12	32.69	25.53	33.80
Area1	6.05	6.01	5.59	6.65
Area2	13.52	14.14	13.09	12.56
Area3	14.95	14.26	17.92	13.18
Area4	10.99	9.75	12.51	12.16
Area5	18.47	18.69	16.64	20.01
Area6	9.59	8.55	9.05	12.64
Area7	9.30	9.51	9.31	8.82
Area8	5.62	5.89	5.37	5.26
Area9	10.39	12.15	9.88	6.85
PAS	52.34	•	•	•
NPS	25.40	•	•	•
PRS	22.26	•	•	•
Educ[a]	13.19	13.42	12.87	13.03
Exp[a]	13.71	17.41	4.47	15.56
Female	8.28	5.36	13.21	9.49
White	79.43	78.96	77.58	82.65
Mrdnow	63.11	74.57	30.52	73.35
Grade[a]	5.03	5.46	3.65	5.59
ARNG	41.41	34.55	43.97	54.60
USAR	20.39	21.85	17.99	19.68
USNR	11.33	16.74	6.47	4.15
USMCR	6.94	3.40	17.70	2.97
ANG	12.67	13.81	9.45	13.66
USAFR	7.27	9.64	4.43	4.94
Resaninc[a]	2,704	2,913	1,922	3,105
Wkearn[a]	394	441	270	426
Wkhr[a]	42.31	42.83	39.94	43.79
Sample size[a]	28,009	14,659	7,114	6,236

[a]Unit other then percent reported (see table III.1 for explanation).

Table III.3: Means of the Six Reserve Components

Figures in percent

Variable	ARNG	USAR	USNR	USMCR	ANG	USAFR
Attrition	2.69	4.48	4.98	9.32	2.48	3.39
Pastbon	41.44	37.06	18.15	18.63	20.99	15.57
Lostopay	16.81	12.85	13.11	23.06	10.62	11.54
Mosdum	12.09	15.48	20.33	16.73	6.59	7.12
WC	24.29	32.15	40.12	27.53	40.63	39.93
Area1	6.08	4.94	6.11	5.46	8.93	4.42
Area2	10.87	17.58	15.32	19.35	11.67	12.08
Area3	15.20	14.52	14.25	15.75	13.36	17.88
Area4	13.63	11.30	8.48	5.76	11.05	3.83
Area5	17.99	21.12	19.63	18.06	14.62	19.01
Area6	12.92	8.69	4.76	5.87	10.54	2.55
Area7	9.06	8.63	9.27	9.68	7.69	15.08
Area8	5.98	4.05	5.74	3.40	8.59	4.72
Area9	6.82	7.48	16.45	16.68	12.14	20.43
PAS	43.67	56.09	77.34	25.68	57.06	69.40
NPS	26.97	22.42	14.50	64.80	18.93	15.47
PRS	29.36	21.49	8.16	9.52	24.01	15.13
Educ[a]	12.78	13.32	13.62	13.12	13.63	13.79
Exp[a]	13.64	13.42	16.03	6.18	15.43	15.51
Female	3.17	15.87	10.90	3.35	8.54	16.21
White	81.63	70.12	86.32	75.09	85.69	7.49
Mrdnow	65.60	60.28	67.82	34.53	68.84	66.80
Grade[a]	4.91	5.20	5.20	4.11	5.21	5.53
Resaninc[a]	2,724	2,767	2,574	1,806	2,880	3,162
Wkearn[a]	361	381	466	338	456	454
Wkhr[a]	42.77	41.79	42.55	40.72	42.53	41.90
Sample size[a]	11,598	5,710	3,173	1,943	3,549	2,036

[a]Unit other then percent reported (see table III.1 for explanation).

Table III.4: Logit Results for the Basic Sample

Variable	Coefficient	T-Ratio
Intercept	−.0589***	3.71
Pastbon	−.0028	1.07
Lostopay	.0139***	4.00
Mosdum	.0347***	9.01
WC	.0058**	1.99
Yrur	−.0017*	1.85
Area1	−.0148**	2.16
Area2	−.0068	1.24
Area3	−.0021	.41
Area4	−.0063	1.03
Area5	−.0060	1.06
Area7	.0050	.88
Area8	.0065	.93
Area9	−.0039	.69
PAS	.0134***	3.27
NPS	−.0100**	2.50
Educ	−.0014*	1.88
Exp	−.0010*	1.71
Exp2[a]	.0065	.40
Female	.0079*	1.78
White	.0150***	4.07
Mrdnow	−.0050*	1.93
Grade	−.0063***	4.23
ARNG	−.0138***	4.37
USAR	.0017	.41
USMCR	.0270***	4.52
ANG	−.0137***	3.33
USAFR	−.0043	.82
Resaninc[a]	−.0048***	3.64
Wkearn[a]	.0042	.71
Wkhr[b]	.0033***	2.87
Attrition	3.80	
Sample size	28,009	

* Significant at the 90th percentile
** Significant at the 95th percentile
*** Significant at the 99th percentile

[a]Reported coefficient is multiplied by 10^3.

[b]Reported coefficient is multiplied by 10.

Table III.5: Logit Results for the Prior Active Service, Nonprior Service, and Prior Reserve Service Samples

Variable	PAS	T-R	NPS	T-R	PRS	T-R
Intercept	−.0417*	1.92	−.0963***	2.65	−.0816***	2.90
Pastbon	.0035	.86	−.0170***	3.41	.0008	.17
Postopay	.0057	1.14	.0263***	3.52	.0155**	2.46
Prosdum	.0280***	5.66	.0611***	6.28	.0292***	3.76
VC	.0080*	1.94	.0038	.61	.0020	.39
Yrur	−.0019	1.49	−.0045**	2.02	.0008	.64
Area1	−.0158	1.62	−.0338***	2.69	.0173	1.08
Area2	−.0085	1.08	−.0085	.71	−.0034	.36
Area3	−.0002	.00	−.0153	1.55	.0150	1.42
Area4	−.0055	.61	−.0083	.64	−.0080	.82
Area5	−.0064	.77	−.0158	1.40	.0063	.60
Area7	.0142	1.61	−.0083	.73	.0016	.17
Area8	.0043	.44	.0129	.83	.0005	.00
Area9	−.0052	.66	−.0102	.88	.0080	.68
Educ	−.0011	1.08	.0001	.00	−.0006	.49
Exp	−.0024***	3.07	.0022	1.20	−.0004	.32
Exp2[a]	.0498**	2.48	−.0863	.85	−.0140	.41
Female	.0099	1.50	.0016	.17	.0002	.00
White	.0202***	3.63	.0177**	2.25	.0035	.61
Mrdnow	−.0085**	2.53	.0005	.10	−.0041	.98
Grade	−.0045**	2.20	−.0119***	3.35	−.0059**	2.21
ARNG	−.0150***	3.84	−.0089	.89	−.0009	.10
USAR	−.0018	.37	.0188	1.41	.0170	1.08
USMCR	.0327***	3.45	.0414***	2.82	.0617**	2.35
ANG	−.0141***	2.74	−.0063	.48	−.0064	.55
USAFR	−.0066	1.10	.0139	.75	.0005	.00
Resaninc[a]	−.0081***	4.53	.0001	.00	.0008	.42
Wkearn[a]	.0013	.14	.0031	.22	.0144	1.62
Wkhr[b]	.0026	1.53	.0037	1.58	.0031	1.53
Attrition	3.92		4.70		2.50	
Sample size	14,659		7,114		6,236	

* Significant at the 90th percentile
** Significant at the 95th percentile
*** Significant at the 99th percentile

[a]Reported coefficient is multiplied by 10^3.

[b]Reported coefficient is multiplied by 10.

Table III.6: Logit Results for the Army National Guard, Army Reserve, and Naval Reserve Samples

Variable	ARNG	T-R	USAR	T-R	USNR	T-R
Intercept	−.0746***	3.86	−.0862**	2.40	−.1162**	1.97
Pastbon	−.0017	.52	−.0004	.00	.0069	.63
Lostopay	.0098**	2.23	.0184**	2.08	.0050	.41
Mosdum	.0129***	2.64	.0639***	6.64	.0323***	2.94
WC	.0037	.92	.0113	1.54	.0025	.28
Yrur	−.0003	.24	−.0015	.75	−.0017	.46
Area1	−.0088	1.02	−.0147	.78	.0044	.14
Area2	−.0065	.96	−.0029	.20	−.0029	.10
Area3	−.0024	.41	.0231	1.38	.0202	.70
Area4	−.0001	.00	.0013	.10	.0219	.65
Area5	−.0012	.17	.0105	.62	.0085	.30
Area7	−.0019	.30	.0521***	2.71	.0503	1.45
Area8	.0043	.53	.0168	.79	.0373	1.04
Area9	−.0067	.95	.0158	.85	.0263	.85
PAS	.0081*	1.75	.0084	.96	.0839**	2.27
NPS	−.0070	1.50	−.0097	1.01	.0168	.57
Educ	.0006	.62	−.0030*	1.68	.0009	.37
Exp	.0003	.39	−.0031**	2.27	−.0030*	1.72
Exp2[a]	−.0224	1.00	.0660*	1.81	.0987**	2.29
Female	.0315***	3.27	−.0064	.82	.0196	1.36
White	.0080*	1.67	.0142*	1.82	.0187	1.29
Mrdnow	−.0022	.66	−.0051	.83	−.0096	1.14
Grade	−.0085***	4.00	−.0029	.83	−.0111**	2.38
Resaninc[a]	−.0030*	1.69	−.0070**	2.19	−.0091*	1.94
Wkearn[a]	.0170**	2.50	.0118	.86	−.0026	.14
Wkhr[b]	.0024*	1.69	.0058**	2.08	−.0023	.55
Attrition	2.69		4.48		4.98	
Sample size	11,598		5,710		3,173	

* Significant at the 90th percentile
** Significant at the 95th percentile
*** Significant at the 99th percentile

[a]Reported coefficient is multiplied by 10^3.

[b]Reported coefficient is multiplied by 10.

Table III.7: Logit Results for the Marine Corps Reserve, Air National Guard and Air Force Reserve Samples

Variable	USMCR	T-R	ANG	T-R	USAFR	T-R
Intercept	.0326	.28	.0199	.57	−.0292	.41
Pastbon	−.0322*	1.93	−.0005	.10	−.0079	.72
Lostopay	.0572***	2.97	.0074	.79	.0189	1.27
Mosdum	.0974***	4.27	.0214*	1.95	.0625***	3.36
WC	.0121	.73	.0101	1.50	.0032	.33
Yrur	−.0204**	2.51	−.0021	1.16	−.0012	.26
Area1	−.0786***	2.72	−.0136	1.21	−.0108	.32
Area2	−.0312	1.02	−.0116	1.20	−.0159	.62
Area3	−.0538**	2.27	−.0087	.99	−.0032	.10
Area4	−.0622**	2.11	−.0098	.94	−.0237	.87
Area5	−.0558**	2.01	−.0145*	1.72	−.0156	.60
Area7	−.0504*	1.78	−.0052	.50	−.0063	.26
Area8	−.0606*	1.75	−.0006	.00	.0279	.62
Area9	−.0368	1.32	−.0149*	1.77	−.0180	.82
PAS	.0135	.47	.0172*	1.67	.0296	1.46
NPS	−.0366	1.48	−.0105	1.26	.0179	.77
Educ	−.0056	1.06	−.0013	.79	−.0066**	2.33
Exp	.0041	.77	.0015	.98	.0023	.99
Exp2[a]	−.4655**	2.07	−.0772	1.56	−.0951	1.42
Female	−.0462	1.20	.0230**	2.11	−.0003	.00
White	.0865***	3.47	.0008	.10	.0163	1.20
Mrdnow	−.0236	1.47	.0050	.70	−.0135*	1.84
Grade	.0006	.00	−.0145***	3.97	.0002	.00
Resaninc[a]	.0046	.40	−.0031	1.20	−.0070*	1.86
Wkearn[a]	−.0381	1.01	−.0129	.85	−.0478*	1.71
Wkhr[b]	.0070	1.07	.0007	.24	.0082*	1.80
Attrition	9.32		2.48		3.39	
Sample size	1,943		3,549		2,036	

* Significant at the 90th percentile
** Significant at the 95th percentile
*** Significant at the 99th percentile

[a]Reported coefficient is multiplied by 10^3.

[b]Reported coefficient is multiplied by 10.

Units Visited

Army Reserve

Headquarters First Army, Ft. Meade, MD
Headquarters Second Army, Ft. Gillem, GA
Headquarters Fourth Army, Ft. Sheridan, IL
Headquarters Sixth Army, The Presidio, CA
239th Transportation Company, Waycross, GA
928th Combat Support Company, Macon, GA
21st Medical Detachment, St. Louis, MO
941st Transportation Company, Charleston, SC
C Company 321st Engineer Battalion, Ogden, UT
15th Field Artillery 3rd Battalion, Anniston, AL
B Company 483rd Engineer Battalion, Taunton, MA
1st Battalion 211th Field Artillery, New Bedford, MA
C Company 3rd Battalion 87th Infantry, Aurora, CO
C Company 3rd Battalion 205th Infantry, Cannon Falls, MN
B Company 205th Main Support Battalion, St. Paul, MN
915th Transportation Company, Council Bluffs, IA
425th Transportation Brigade, Ft. Sheridan, IL
86th Army Reserve Command, Hartfield, IL
85th Training Division, Hartfield, IL

Army National Guard

49th Division Field Artillery, San Antonio, TX
1st Battalion 152nd Infantry, Jasper, IN
113th Medical Battalion, Indianapolis, IN
1st Battalion 210th Armor, Albany, NY
250th Support Battalion, Sea Girt, NJ
726st Main Support Battalion, Natick, MA
F Company 726th Main Support Battalion, Waltham, MA
249th Support Battalion, Austin, TX
1st Battalion 101st Infantry, Dorchester, MA
E Company 131st Aviation Battalion, Birmingham, AL
F Company 425th Infantry, Pontiac, MI
1st Battalion 147th Aviation, Madison, MI
3rd Battalion 111th Air Defense Artillery, Portsmouth, VA
422nd Signal Battalion, Reno, NV
113th Aviation Battalion, Reno, NV
D Company 113rd Aviation Battalion, Reno, NV
1150th Medical Detachment, Reno, NV
1st Battalion 181st Field Artillery, Chattanooga, TN
4th Battalion 133rd Field Artillery, New Braunfels, TX
3rd Battalion 133rd Field Artillery, El Paso, TX
3rd Battalion 132nd Field Artillery, San Angelo, TX

	47th Attack Helicopter Battalion, Truax, WI 1st Battalion 200th Air Defense Artillery, Roswell, NM
Air National Guard	189th Tactical Airlift Group, Little Rock, AR 166th Tactical Airlift Group, Wilmington, DE 113th Tactical Fighter Wing, Andrews AFB, MD 120th Fighter Intercept Group, Great Falls, MT 171st Aerial Refuelin Wing, Pittsburgh, PA 192nd Tactical Fighter Group, Richmond, VA 128th Tactical Fighter Wing, Madison, WI 128th Aerial Refueling Group, Milwaukee, WI
Air Force Reserve	Headquarters Air Force Reserve, Robbin Air Force Base, GA Headquarters Tenth Air Force, Bergstrom Air Force Base, TX 96th Mobile Aerial Port Squadron, Little Rock, AR 482nd Tactical Fighter Wing, Homestead Air Force Base, FL 944th Tactical Fighter Group, Luke Air Force Base, AZ 914th Tactical Airlift Group, Niagara Falls Air Force Base, NY 67th Aerial Port Squadron, Hill Air Force Base, UT 908th Tactical Airlift Group, Maxwell Air Force Base, AL 433rd Airlift Wing, Kelly Air Force Base, TX 42nd Medical Service Squadron, Norton Air Force Base, CA 924th Tactical Airlift Group, Bergstrom Air Force Base, TX 302nd Tactical Airlift Wing, Peterson Air Force Base, CO 349th Military Airlift Wing, Travis Air Force Base, CA
Marine Corps Reserve	Headquarters 4th Marine Division/Wing, New Orleans, LA 4th Maintenance Battalion, Omaha, NE Marine Aircraft Group 49, Willow Grove, PA 3rd Battalion 24th Marines, Bridgeton, MO Weapons Company 3rd Battalion 24th Marines, Dallas, TX G Company 3rd Battalion 24th Marines, Dallas, TX I Company 3rd Battalion 24th Marines, Dallas, TX Headquarters 6th Engineer Support Battalion, Portland, OR E Company 2nd Battalion 25th Marines, Harrisburg, PA Marine Air Control Group 48, Glenview Naval Air Station, IL
Naval Reserve Units	Headquarters Naval Reserve, New Orleans, LA USS Estocin, Philadelphia, PA

Reconnaissance Squadron 59, Dallas, TX
COMSEVENTHFLT 111, Dallas, TX
LHA-1 DET 119, Phoenix, AZ
Mobile Undersea Warfare Unit 112, Bridgeton, MO
Reserve Naval Support Construction Force 3, Columbia, SC
Attack Squadron 203, Jacksonville, FL
USS Wadsworth, Long Beach, CA
Naval Reserve Readiness Center, San Diego, CA
Patrol Squadron 60, Glenview Naval Air Station, IL
Naval Construction Regiment 6, Glenview Naval Air Station, IL

Comments From the Department of Defense

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

RESERVE AFFAIRS

NOV 2 9 1990

Mr. Frank C. Conahan
Assistant Comptroller General
National Security and
International Affairs Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) Draft Report, "RESERVE COMPONENT PERSONNEL: Factors Related to Attrition In The Selected Reserve," Dated October 3, 1990 (GAO Code 390060/OSD Case 8492). While the DoD does not agree with all of the findings and recommendations, the GAO draft report is generally balanced and well documented.

The DoD agrees that attrition from the Reserve components, particularly unprogrammed early attrition, deserves continuing attention. The DoD has devoted and is continuing to devote considerable effort to that issue.

The detailed Department comments on the report findings and recommendations are provided in the enclosure. The DoD appreciates the opportunity to comment on the GAO draft report.

Sincerely,

Stephen M. Duncan

Enclosure:
As Stated

GAO DRAFT REPORT - DATED OCTOBER 3, 1990
(GAO CODE 390060) OSD CASE 8492

"RESERVE COMPONENT PERSONNEL: FACTORS RELATED TO ATTRITION IN THE SELECTED RESERVE"

DEPARTMENT OF DEFENSE COMMENTS

*****

FINDINGS

FINDING A: Selected Reserve. The GAO reported that there are three Reserve component categories: the Ready Reserve, the Standby Reserve, and the Retired Reserve. The GAO observed that under the Total Force policy of the Department of Defense, Reservists will be the primary source of personnel to augment the active forces in military emergencies--such as the current crisis in the Persian Gulf. The GAO found that the majority of the Reservists will come from the 1.6 million members of the Ready Reserve, which consists of the Selected Reserve, the Individual Ready Reserve, and the Inactive National Guard. The GAO explained that the Selected Reserve is comprised primarily of part-time drilling Reservists, but noted that it also has some full-time personnel. The GAO further reported that most members of the Selected Reserve are assigned to mobilization units and must participate in 48 drills (inactive duty training periods of at least four hours) and at least two weeks of active duty annually. The GAO concluded that, although the U.S. is entering an era of anticipated dramatic force size reductions, it is not yet clear whether Reserve forces will also be cut or how the Reserves will fit in the overall force structure. The GAO further concluded that, even if the eventual decision is to cut the Reserves, attrition will still need to be managed rather than just accepted--and the Reserves need to be able to retain who they need, not just who they get. (pp. 2-4/GAO Draft Report)

Now on p. 2.

DoD COMMENT: Concur.

FINDING B: Nonprior Service Personnel Are Higher Attrition Risks. The GAO reported that, from 1980 through 1988, the Selected Reserve experienced a relatively unchanged level of personnel turnover, despite increased personnel strength, improved quality of recruits, increased pay and benefits, and new equipment. The GAO found that the Selected Reserve lost a total of 220,909 enlisted personnel in FY 1988, with reported attrition rates ranging from 11 percent in the Air National Guard to 30 percent in the Army Reserve. The GAO observed that much of the turnover in National Guard and Reserve units is due to the unprogrammed loss of Reservists, who simply stop participating in training before their enlistment terms in the Selected Reserve are completed.

Enclosure

The GAO found that the Reserve Components depend on recruits with and without prior military service to meet their manpower requirements. The GAO examined losses in the Selected Reserve by grade and prior service status to determine the types of personnel in different loss categories. The GAO found that, although nonprior service recruits made up 42 percent of the enlistments in FY 1988, they constituted 61 percent of overall losses in the Selected Reserve. The GAO further found that four out of five enlistees without previous military service failed to complete their 6-year enlistments--and that they constitute the majority of overall losses in the Selected Reserve.

The GAO concluded that, in general, nonprior service Reservists are proportionally higher attrition risks than those with prior service. The GAO further concluded that loss of nonprior service personnel also represents a direct cost to the Reserve components for recruiting and training. The GAO also concluded, however, that although prior service losses do not have the same direct cost impact, they may be potentially more damaging to the Selected Reserve because they represent a loss of more experienced personnel. (p. 2, pp. 4-7, pp. 15-27, p. 30/GAO Draft Report)

Now on pp. 2-5, 10-17, and 19.

See comment 1.

DoD COMMENT: Partially concur. The FY 1988 total losses of 220,909, as reported by the GAO, include losses due to death, retirement, transfer to the active component or to other Reserve components, etc. That is also true for the loss rates cited by the GAO. As a result, while the GAO is correct that loss rates, including all types of losses, ranged from 11 percent in the Air National Guard to 30 percent in the Army Reserve, those comparisons have little meaning, because the GAO included both part-time and full-time members when computing the loss rate. Nearly one-third of Air National Guard members serve in a full-time status, from which attrition is relatively low. By contrast, less than one in ten Army Reserve Selected Reservists serve full-time as Military Technicians or as Active Guard and Reserve members. In addition, the Air National Guard is a relatively senior force. Its members are older and generally well established in their jobs and families. The Army Reserve, by contrast, has a younger membership, more junior in length of service. As such, members of the Army Reserve are impacted much more by job and family conflicts and characterized by greater geographic mobility.

FINDING C: More Comprehensive Attrition Information Needed. The GAO reported that, because personnel losses are unevenly distributed across grade groups, overall loss rates mask the extent of losses in particular grade groups. For example, the GAO found that, although the overall Marine Corps Reserve loss rate was 28 percent, attrition for Marine Reservists in grades E4-E5 was 45 percent. The GAO also noted that, while the Army Reserve overall attrition rate in California was 35 percent, 71 percent of the units were high loss units. The GAO also found that the enlisted force profiles of the Reserve components

differed markedly (see report figure 2.2), and that enlisted losses are not distributed evenly across the force, but are concentrated in the lower grade levels (see report figure 2.3). The GAO concluded that attempts by the Department of Defense to resolve the attrition problem have been hampered by inadequate attrition information, because aggregated attrition data can mask the effects of attrition when losses are concentrated in certain grade groups or certain units. (p. 7, pp. 27-32/GAO Draft Report)

Now on pp. 5, 16-21.

DoD COMMENT: Partially concur. The DoD agrees that more comprehensive attrition information is desirable. However, the DoD does have standardized attrition information, albeit imperfect, for all components, including data covering many years of experience. The RAND Corporation, in support of the Assistant Secretary of Defense for Reserve Affairs, has completed extensive analyses of attrition in the Army National Guard and Army Reserve. Those analyses include detailed information on type of loss for both prior service accessions and nonprior service accessions. Additional studies analyzed attrition from nonprior service accessions while in the training base for the Army National Guard and Reserve. The data cover 70 percent of the Selected Reserve population. In addition, the Assistant Secretary of Defense for Reserve Affairs supported the development of a policy screening model which now incorporates both officer and enlisted continuation data from 1978 through 1989 by category of Selected Reserve service -- i.e. part-time, Active Guard and Reserve, and military technician. That work is based on cohort files developed by the Defense Manpower Data Center for use by the DoD. The GAO is correct that the DoD files do not always include good detail on the loss type or reason; however, as analyzed by the Defense Manpower Data Center and RAND, the DoD can indicate accurately the most important categories of loss (to another Selected Reserve component, to the active force, to civil life, etc.). Those data have been created through a series of file matching procedures. The DoD efforts can and will be improved upon, but currently they do provide important and detailed information.

See comment 2.

FINDING D: Unit Loss Data. The GAO reported that, because the geographical dispersion of units prevents the transfer of Reservists to fill shortages, unit loss rates are an important measure of attrition effects and, for that reason, unit loss data should be more important to decision makers than aggregate loss data. The GAO noted that, according to the DoD, the effects of personnel turnover are compounded by unprogrammed losses in units. They found that the resulting turbulence affects personnel readiness because it (1) hampers units in reaching higher levels of training, (2) requires repetitive training cycles to train new teams and crews, and (3) contributes to the problem of duty position qualification.

The GAO was unable to analyze unit attrition in all the Reserve components because of missing data in the unit loss information

provided by the Defense Manpower Data Center. The GAO was, however, able to conduct some analyses of Army National Guard and Army Reserve units, because the Army was able to provide detailed unit loss data. The GAO comparison of overall losses within a state with unit losses within that state showed that overall rates did not necessarily indicate the extent of attrition problems in units. The GAO also observed that smaller units made up a larger proportion of high loss units in both the Army National Guard and the Army Reserve. The GAO concluded that unit loss rates are an important measure of attrition because of the geographical unit structure of the Selected Reserve and because they can indicate manning and structure problems. (p. 5, pp. 32-40, p.43/GAO Draft Report)

Now on pp. 3, 20-25, and 27.

See comment 3.

DoD COMMENT: Partially concur. The DoD agrees that losses at the unit level have a greater impact on the unit than the overall loss rates and that such losses are important and can effect readiness. The DoD does not agree that unit loss data should, therefore, be more important to decisionmakers than aggregate loss data. As other parts of the GAO report indicate, aggregate data can help pinpoint the most important factors relating to attrition, thus suggesting policy changes. The analysis of unit data is not sufficient in that respect.

FINDING E: The DoD Needs Better Attrition Information. The GAO reported that the DoD management of attrition is hampered by the lack of accurate and meaningful attrition information. The GAO found that published loss data from the Reserve Components Common Personnel Data System (the official source of manpower information) do not always reflect the correct categorization of losses, and that most loss data are aggregated to force level. The GAO also found that the Reserve Components Common Personnel Data System (1) could not identify approximately 28 percent of enlisted losses in FY 1988 by unit or state, (2) understated transfers from the Selected Reserve to the Individual Ready Reserve, and (3) could not identify 11 percent of losses by type. (Some of the problem was due to the lack of common, consistent definitions of attrition, which resulted in losses being incorrectly categorized.) The GAO expressed concern about the accuracy of the published loss data, due to the large number of personnel in the unknown or other categories. In addition, the GAO found that there were discrepancies in total losses by unit and by loss type when it compared loss data provided by Defense Manpower Data Center with Service or unit data. The GAO further found that (1) Defense Manpower Data Center unit loss data for the Army National Guard could not be reconciled with Army data for almost 90 percent of the units, (2) Air National Guard losses to the Individual Ready Reserve were not identified, and (3) total losses for the Naval and Marine Corps Reserve were significantly lower than the published DoD information.

The GAO also noted that the Reserve components reported first term retention rates ranging from 60 percent for the Army Reserve to 87 percent for the Air National Guard in FY 1988. The GAO

found, however, that those retention rates were based only on the number of individuals eligible to reenlist and ignored those who left the Selected Reserve before their enlistments expired. The GAO concluded, therefore, that since only 20 percent of nonprior service personnel completed a full enlistment, the actual first term retention rate was probably in the range of 12 to 17 percent.

The GAO concluded that measures of attrition should focus (1) on unit loss rates, (2) on types of losses, and (3) because of the importance of unprogrammed losses, on losses that occur before the expiration of service terms. The GAO also concluded that the relationship of manageable losses to the overall losses in a unit is an important indicator of attrition. In addition, the GAO concluded that measures of attrition should include the use of common terms and definitions to preclude such situations as a manageable loss in one Reserve component being classed as a nonmanageable loss in another. The GAO further concluded that loss transactions do not always reflect the correct type of loss. Finally, the GAO concluded that the current information, which gives overall loss rates and retention rates, does not provide decisionmakers with sufficiently detailed data. (p. 5, p. 7, pp. 40-44/GAO Draft Report)

Now on pp. 3, 5, and 25-27.

DoD COMMENT: Concur. The DoD agrees that more comprehensive attrition information is desirable. As indicated in the DoD comment on Finding C, however, the DoD does have attrition information, albeit imperfect, in considerable detail for all components and covering many years of experience. The overall continuation rates included in the quarterly reports (based on the Reserve Components Common Personnel Data System) are intended only to provide general trends in a uniform format for a wide range of users. They were never intended to provide decision makers with detailed data on attrition. It is not clear why the GAO was unable to reconcile unit and aggregate loss data. The procedures used to calculate the continuation rates included in the official National Guard and Reserve manpower strengths and statistics ensure the validity of the data.

FINDING F: Reserve Environment Is A Factor In Attrition. The GAO reported that, since the Selected Reserve is primarily a part-time force, its members generally have full-time occupations from which their primary incomes are derived. The GAO observed that membership in the Selected Reserve is similar to "moonlighting" or having a second job. The GAO found that local economic conditions may make the Selected Reserve less financially rewarding than other second jobs or overtime pay opportunities. Moreover, the GAO found that the additional responsibilities placed on the National Guard and Reserves as part of the Total Force policy have increased time demands on members.

The GAO also reported that geographical dispersion of units poses training problems during normal inactive duty training because

all units do not have access to training areas, firing ranges, and--in some cases--their heavy equipment. The GAO noted that, in contrast, Air Force Reserve and Air National Guard units are usually consolidated and often located at active component installations and that, according to Air Force Reserve unit officials, the collocation of units is a contributing factor to both lower attrition and higher morale.

The GAO concluded that many of the conditions which contribute to attrition problems in the Reserve components are simply an inherent aspect of the Reserve environment and the increasing demands caused by the Total Force policy. The GAO also concluded that, because Reserve service is a second job, the fact there are competing demands between Reserve service and leisure time is an important factor in attrition. (p. 5, pp. 46-48, p. 62/GAO Draft Report)

Now on pp. 3, 29-30, and 37.

DoD COMMENT: Concur. Implementation of the Total Force Policy has resulted in improved Reserve training, equipment, and facilities -- and in the much more frequent use of Reserve units and personnel to perform real world missions. Those factors have increased personal satisfaction with Reserve service. During the All Volunteer Force/Total Force Policy era, the retention of enlisted personnel who have completed their first term of service has increased significantly. The DoD does not agree fully with the GAO observation that Reserve service is similar to "moonlighting" or having a second job. Unlike the secondary labor market in the civilian sector, Reserve service involves (1) a long term obligation to serve, (2) intensive and lengthy initial training, (3) absence from the primary job for two or more weeks a year, (4) long term career orientation, (5) the potential for mobilization, and (6) the need to attract and retain individuals with leadership and managerial talents.

See comment 4.

FINDING G: Analysis Of The 1986 Reserve Component Survey Data Base. Using the 1986 Reserve Component Survey data base of over 28,000, the GAO was able to examine the factors contributing to attrition by observing actual attrition behavior.

- Specialty Mismatches Are Strongly Related To Attrition. The GAO reported its analysis showed that a mismatch between a reservist's primary specialty and his or her duty specialty was the factor most strongly related to attrition. The GAO noted that, according to unit officials, requalifying reservists for new skills was a problem, because many military occupational specialties can only be acquired by attending Active schools.

- Civilian Jobs Can Conflict With Reserve Obligations. The GAO concluded that responsibilities to civilian employers often conflict with military obligations--and the reported loss of overtime opportunities increased attrition probability, as did employment in a white collar civilian occupation. The GAO observed that many unit officials listed job conflicts as a major contributor to attrition.

Now on pp. 3-4, 30-33, and 38.

- Military Backgrounds Influence Attrition. The GAO further concluded that the nonprior service Reservists were the most responsive to economic and policy variables, such as promotions to higher military grades or bonuses. (p. 5, pp. 49-53, p. 62/GAO Draft Report)

DoD COMMENT: Concur.

FINDING H: Additional Attrition Factors. The GAO reported that unit officials frequently mentioned other factors as contributing to attrition of Reservists, as follows:

- Reserve Pay Is A Continuing Problem. The GAO observed that the 1988 Army Reserve Survey found that delayed pay and benefits was a major source of dissatisfaction--and that was confirmed by personnel at several of the units the GAO visited. (The GAO noted, for example, that one unit commander stated that he could cut his unit's attendance problems in half by paying his troops at the end of the drill period.)

- Nonprior Service Enlistment Terms May Be Too Long. The GAO also observed that some officials stated that enlistment terms for nonprior service personnel are too long. The GAO found that attrition studies have shown that only one out of five nonprior service Reservists completed his/her enlistment. The GAO noted that the 1988 Army Reserve Study showed that 45 percent of junior enlisted personnel were dissatisfied with lengths of enlistment. The GAO also noted that one commander stated that to expect an 18-to-20-year old to make a commitment for a period equal to one-third of his/her life to that point, and then expect him/her to keep it, is unrealistic.

- Dissatisfaction With Inactive Duty Training Is Related To Attrition. The GAO noted that senior Reserve officials stated that ineffective unit leadership and poor quality training were major factors contributing to attrition. The GAO noted that during its unit visits, dissatisfaction with the quality of inactive duty training, as compared to annual training or to active duty, was also mentioned as a cause of attrition. The GAO noted that the 1988 Reserve Component Survey showed that approximately 39 percent of Naval Reservists were very dissatisfied with their opportunity to use military skills during inactive duty drills; whereas, in contrast, members of the Air Force Reserve and Air National Guard expressed relatively high levels of satisfaction. The GAO concluded that the dissatisfaction appears to be due mostly to the type of training during weekend drills, although the lack of training facilities and equipment is also a factor. The GAO further concluded those units that can conduct meaningful inactive duty training during weekends may reduce this attrition factor. In addition, the GAO

observed that, while most Reservists expressed satisfaction with two-week annual training, it does not mean that lengthening the period of that training is the answer to attrition problems.

- Additional Training Requirements Can Increase Losses. The GAO noted that extended annual training overseas (which is characterized as a positive factor) requires preparation--and that the additional training required for those exercises or due to force structure organizational changes can increase loss rates.

The GAO concluded that revising the allocation of training time between inactive duty and active duty to provide units more flexibility and better quality training is one option that warrants consideration and testing. The GAO also concluded that the timely receipt of pay and benefits is a factor in retention, and a system to pay Reservists at the end of a weekend drill may offer potential. In summary, the GAO concluded that, without some innovative approaches, the Services may be losing available opportunities to retain those Reservists and National Guardsmen they need. (p. 5, p. 8, pp. 54-63/GAO Draft Report)

Now on pp. 4, 7, and 33-38.

DoD COMMENT: Partially concur. The DoD does not agree that nonprior service enlistment terms are too long. The terms of enlistment available in the Reserve components for nonprior service individuals range from three to six years in the Selected Reserve with the balance of the statutory eight year Military Service Obligation to be served in the Individual Ready Reserve. Although there may be some perceived dissatisfaction with the length of the term of the Selected Reserve agreement, the existing term of the Military Service Obligation is identical for all members without prior service, whether they are entering an active or a Reserve component.

FINDING I: Bonus Programs Need Modification. The GAO reported that the Reserve components have management programs that are designed to deal with the problems of Reserve attrition and have also implemented several programs to improve retention. The GAO further reported that the Reserve components are aware of the seriousness of the problems facing them and are taking actions to solve them--such as using recruiting and retention bonuses. The GAO observed, however, that as currently devised, some of the programs may not be effective retention mechanisms or may cause inequities. The GAO commented that, with the exception of the Army Reserve, there appears to be a relationship between the percentage of bonus recipients and Service losses. The GAO observed, for example, that both the Navy and Marine Corps Reserves have lower percentages of bonus recipients and generally higher loss rates than the other Services.

- Execution of Bonus Programs Could Be Improved. The GAO reported that some Reserve officials are skeptical about the effectiveness of bonus programs on retention; however the GAO

analysis of attrition factors, using the 1986 Reserve Components Surveys data base, showed that bonuses did have a significant effect on retention of nonprior service personnel. The GAO also reported that, to improve the effectiveness of its bonus programs, the Air Force Reserve decentralized program execution and changed the payment approach. The GAO concluded that decentralization of bonus authority to the unit level might provide the opportunity to concentrate resources where they are most needed.

- Current Bonus Programs For Prior Service Reservists Are Not Effective. The GAO also reported that the loss of large numbers of Reservists with prior active service indicates that current bonus programs may not be an effective retention tool for that category of Reservists. The GAO analysis of attrition factors using the 1986 Reserve Component Survey data base showed that bonuses had little effect on the retention of prior service individuals. The GAO concluded, however, that paying such bonuses in monthly installments with special completion bonuses, such as at the end of a year of satisfactory participation, might better emphasize the benefits of continuing service.

- Educational Assistance Programs. The GAO reported that approximately 121,000 members of the Selected Reserve are currently participating in the Montgomery GI Bill for the Selected Reserve program. The GAO noted, however, that delays of from four to six months for a Reservist to start receiving benefits under that program can reduce its effectiveness, because such delays can cause hardships for Reservists in school. The GAO reported that, in addition, it is DoD policy to recoup payments from Reservists who have received enlistment/reenlistment bonuses or benefits from the Montgomery GI Bill and fail to complete their prescribed service in the Selected Reserve. The GAO found, however, that recouping bonuses presents problems unless the Reservist is a Federal employee, or has sufficient military pay due to cover the recoupment. The GAO concluded that modifying enlistment/reenlistment bonus programs to reduce or eliminate up front payments might result in savings.

In summary, the GAO concluded that enlistment and reenlistment bonuses can affect retention, but some modifications could probably increase their effectiveness--for example, paying bonuses in monthly installments with a yearly completion payment might make them a more effective retention device. In addition, the GAO concluded that implementing bonuses on a unit rather than on a force basis might be more effective, because of the unit orientation of the reserve component structure. (p. 6, pp. 9-10, pp. 65-74, p. 80/GAO Draft Report)

Now on pp. 4-7, 40-44, and 47.

DoD COMMENT: Partially concur. The bonus programs are implemented both on a unit and on an aggregate force basis depending on the shortages being experienced in the components.

See comment 5.

It is possible that paying completion bonuses may be relatively more cost effective. The GAO finding that current bonus programs for prior service Reservists are not effective is not supported by DoD analyses. In its 1989 study of Reserve accessions among individuals with prior military service, the RAND Corporation found that "the affiliation bonus for prior active duty personnel is associated with a large increase in the likelihood of joining the reserves." RAND estimated the cumulative effect of the affiliation bonus in the first year after separation from active duty to be an increase of about 30 percent in the accession rate of eligible individuals.

See comment 6.

When the Montgomery GI Bill was enacted in 1984, the legislation called for it to begin quickly, with very little start-up time allowed. Systems were not in place and the software necessary to identify all eligibles was not available immediately. Modifications and improvements have been made to personnel systems in the Military Departments to ensure that payments for all eligibles can begin promptly. The personnel systems and tape exchange process now in place are fully capable of reporting eligibility data to the Department of Veterans Affairs within 90 days following eligibility. The policy of the Department of Veterans Affairs is to pay for 120 days, based on the Notice of Basic Eligibility -- even if the eligibility information is not yet in the automated system. All Reserve components are now making the issuance of the Notice of Basic Eligibility a high priority on the member's in-processing upon return from initial entry training. There is no systemic reason, therefore, why benefits should not be available immediately to the member.

Now on pp. 5, 7, 44-45, and 47-48.

FINDING J: Improving Promotional Opportunities In The Selected Reserve. The GAO reported that the lack of promotional opportunities is frequently cited as one of the reasons for dissatisfaction and attrition in the Selected Reserve. The GAO explained that, because of the geographically restricted unit structure of the Reserve components, many of the higher grade positions in units are held by long term unit members. The GAO noted that the Air Force instituted a high year tenure program to improve promotional opportunities by limiting active participation in Reserve units by years of service or age. The GAO concluded that, without some innovative approaches, the Services may be losing available opportunities to retain those Reservists and National Guardsmen that they need. (p. 6, p. 10, pp. 74-75, pp. 80-81/GAO Draft Report)

DoD COMMENT: Concur.

FINDING K: Improving Transfer Programs For Relocating Reservists. The GAO reported that members of the Selected Reserve, who move for personal or job-related reasons, are often transferred to the Individual Ready Reserve because there are no units with appropriate vacancies for their grades or skills near their new residences. To reduce the losses due to relocation of Reservists, the GAO found the Army Guard and Reserve and the Air

Force Reserve have established formal transfer programs for personnel who move away from their assigned units. The GAO also noted that the Air Force Reserve program assists in relocating personnel, and that, under the Reserve Vacancy Management System, Air Force Reserve units are authorized to maintain over-strength status for up to two years to accommodate relocating personnel. The GAO noted that neither the Naval Reserve nor the Marine Corps Reserve has formal programs to assist Reservists who relocate, although some Naval Reserve unit officials believe that such a program would be useful. The GAO found that existing relocation programs do not have established procedures to locate vacant positions in other components and coordinate transfers between guard and reserve units. The GAO observed that the lack of formal coordination between the National Guard and Reserve means that unless reservists find positions on their own initiative, they may leave the Selected Reserve. (p. 10, pp. 76-77, pp. 80-81/GAO Draft Report)

Now on pp. 7, 45-48.

DoD COMMENT: Concur.

FINDING L: Policies For Dealing With Nonparticipants Need To Be Revised. The GAO reported that, according to unit commanders and senior Reserve officials, one of their major problems is dealing with those Reservists, who simply walk away from their obligation to the Selected Reserve by failing to participate in unit training for their complete enlistment term. The GAO noted that Reserve officials want some sort of sanction to prevent that from occurring, but there is no consensus on what would work or what would be acceptable. The GAO found that the DoD has authority to order nonparticipating Reservists to involuntary active duty, but it is current DoD policy not to do so; therefore, participating in the Reserve Components is, for all intents and purposes, effectively voluntary.

- Effectiveness Of Sanctions Is Limited. The GAO observed that sanctions involving mandatory active duty are not particularly viable, as they would interfere with a Reservist's primary livelihood and could discourage recruitment. The GAO also found that the effectiveness of a less than honorable discharge as a sanction is also questionable because (1) it might not have much effect on a nonprior service Reservist and (2) it would be difficult to justify such an action for a Reservist, who has honorably completed an active duty enlistment. The GAO noted that some states have enacted military codes, which enable the National Guard units to court martial members for missing drills and sentence them to confinement in civilian jails. The GAO found, however, that a comparison of the loss rates between National Guard units and other Reserve component units did not show any advantage that could be attributed to the use of that type of sanction, as the loss rates in some of the other components were lower than the National Guard.

- Alternative Approaches. Another alternative suggested by Reserve officials would be to transfer nonparticipants to the Individual Ready Reserve, with an automatic reduction to the lower enlisted grade and either bar them from returning to the Selected Reserve or order them to active duty for annual training each year with their own or other Reserve units.

The GAO concluded that the DoD does not have a uniform policy covering the disposition and actions against nonparticipants. The GAO further concluded that retaining nonparticipants on unit rolls for excessive periods of time or allowing them to return to units--because of pressures to maintain unit strengths--is likely to affect the morale of the many reservists who attend drills as required. The GAO did conclude, however, that requiring nonparticipants to attend annual training or imposing automatic reductions in grade might be viable alternatives, but noted their effectiveness depends on enforcement. Finally, the GAO concluded that, if enforcement is not practical, then it might be better to acknowledge that service in the Selected Reserve is strictly voluntary and the best alternative may be to discharge nonprior service personnel and transfer prior service personnel to the Individual Ready Reserve. (p. 9, pp. 77-81/GAO Draft Report)

Now on pp. 6, 46-48.

DoD COMMENT: Concur. The DoD policy concerning the disposition of nonparticipants is contained in DoD Directive 1215.5, "Participation in Reserve Training Programs," and DoD Directive 1215.13, "Unsatisfactory Performance of Ready Reserve Obligation." Those Directives prescribe the participation requirements and the sanctions available to the Reserve components in the case of members whose participation is unsatisfactory. The DoD recognizes that the existing policy, which is based in large part on statutes enacted during the draft era, needs to be reassessed in the light of the All-Volunteer Force circumstances. The Assistant Secretary of Defense for Reserve Affairs has focused attention on that issue by convening an attrition task force within his office. He has been engaging in extensive discussion of attrition with the members of the Reserve Forces Policy Board and with the Chiefs of the National Guard and Reserve components. Those discussions covered alternatives to existing sanctions and the effectiveness and appropriateness of existing sanctions and possible alternatives.

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RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense direct the Services to examine the nature and extent of the potential ramifications associated with their reliance on nonprior service recruits to meet manpower requirements. (p. 44/GAO Draft Report)

DoD COMMENT: Partially concur. The mix of prior service and nonprior service personnel varies significantly among the Reserve components, based on their needs. Particularly for the Army National Guard and the Marine Corps Reserve, nonprior service members, who receive active duty training in skills needed in local units, have a better match to skill assignments and vacancies than prior service members. The DoD data indicate that nonprior service members have fewer unit changes than prior service members. In the Army National Guard, the probability of a junior enlisted member being qualified in the duty occupation after six years is over 90 percent for nonprior service accessions, as compared to 75 percent for those with prior service. The DoD is, however, on record in support of the need to utilize personnel released from the active components in the Reserve components. That policy will form an important part of the final strategy for developing the most appropriate force mix, including the best mix of youth and experience, and the ability to maintain that mix. A more definitive nonprior service/prior service mix strategy for Reserve accessions will be established by the end of FY 1991.

See comment 7.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense develop common, uniform measures of attrition for all Services that provide more appropriate and usable data for decision makers on losses in the Selected Reserve than the current overall loss rates. (p. 44/GAO Draft Report)

Now on p. 28.

DoD COMMENT: Partially concur. The DoD has taken action to revise DoD Instruction 7730.54, "Reserve Components Common Personnel Data System," to clarify definitions and provide better information for the management of Reserve component retention and attrition policies. The revised definitions (1) clarify prior and nonprior service, (2) the length of the current Selected Reserve agreement, (3) the date of expiration of that commitment, and (4) the reasons that member was lost from the Selected Reserve. The Instruction is now in formal coordination and publication is expected in FY 1991.

Now on p. 28.

RECOMMENDATION 3: The GAO recommended that the Secretary of Defense improve the accuracy of the Reserve Components Common Personnel Data System. (p. 44/GAO Draft Report)

DoD COMMENT: Concur. Information maintained in the Reserve Components Common Personnel Data System is essential for the effective management of a variety of Reserve component personnel and manpower policies and programs. Therefore, the Reserve components are continuing their efforts to improve the timeliness, quality, and accuracy of their data submissions. Semiannual working group meetings, where representatives from each of the Reserve components can discuss and resolve data issues, have proven to be productive. The working group has formulated important revisions to DoD Instruction 7730.54, "Reserve Components Common Personnel Data System." The revised Instruction, now in formal coordination, clarifies the definitions of the data elements needed to provide necessary information for the management of Reserve component retention and attrition policies. The revised definitions and reporting procedures will clarify (1) prior and nonprior service status, (2) the length of the current Selected Reserve agreement or service commitment and the date of expiration of this commitment, (3) the means of initial entry into military service, and (4) the reason that a member was lost from the Selected Reserve. Implementation of the new definitions will be completed in FY 1991.

Now on p. 38.

RECOMMENDATION 4: The GAO recommended that the Secretary of Defense test with selected units of the Selected Reserve the allocation of the current Reserve training days between active and inactive duty, to determine if there are more effective courses of action than the current weekend a month and two weeks annual training schedule that would make reserve training more flexible, while still meeting training requirements. (p. 62/GAO Draft Report)

DoD COMMENT: Partially concur. The Reserve components presently have the flexibility to adjust their training schedules to accommodate alternative training opportunities. Such adjustments are used to help increase the quality and quantity of unit and individual training to enhance readiness and morale. The Air National Guard, the Air Force Reserve, and certain medical activities have somewhat greater flexibility because of the nature of their missions and training. In contrast, such flexibility is not generally compatible with the requirements of training ground combat units. The DoD will review the feasibility of testing the GAO recommendation. This review will be completed during FY 1991.

Now on p. 48.

RECOMMENDATION 5: The GAO recommended that the Secretary of Defense test with selected units of the Selected Reserve the concept of pay at the end of a weekend drill as a means to improve attendance and reduce nonparticipation. (p. 62/GAO Draft Report)

DoD COMMENT: Nonconcur. It is the DoD position that the introduction of pay at drill would create additional problems, including (1) increased administrative tasks, (2) security for payroll checks, and (3) those associated with returned pay for members who miss a drill. Because the DoD does not agree with the GAO recommendation to pay at drill does not mean the department is unaware that Reserve pay problems have existed in most Reserve components. While recent efforts may have reduced those problems somewhat, further improvement is necessary. The problems are most significant when they persist over a period of time with respect to any member. To resolve the pay problems, the Reserve components must first ensure that the administrative systems and hardware are in place to fix current problems before experimentation with new procedures. The DoD Inspector General has been asked to audit the effectiveness of Reserve pay systems. While the request for audit coverage is not included in the Office of the Inspector General's current work plan, its completion will provide an empirical baseline against which to measure improvements in Reserve pay.

Efforts to improve pay are underway. The Joint System Software pay system used by the Air National Guard and Air Force Reserve generally has been effective. The Army National Guard and Army Reserve plan to implement the Air Force pay system at the end of FY 1991. The Naval Reserve is endeavoring to implement a full "sure pay" system, which will eliminate check mailing to the members home address. The Marine Corps Reserve operates its pay system with a one month delay. That is, Marine Reserve members are paid after each drill period for the previous month's drill attendance. All the Military Services have indicated that they are experiencing fewer pay problems.

RECOMMENDATION 6: The GAO recommended that the Secretary of Defense test a revised enlistment/reenlistment bonus program for Reservists and National Guardsmen to shift bonus payments to monthly installments, with special bonuses for completion of each year of added satisfactory participation. (p. 82/GAO Draft Report)

Now on p. 48.

DoD COMMENT: Concur. Retention of the bonus program is essential to fill shortages and technical skills and to retain pre-trained manpower. A legislative proposal to revise bonus authorities to allow the recommended type of test program will be developed for submission to the 102nd Congress. The proposal should be in coordination within the Administration by the end of FY 1991.

RECOMMENDATION 7: The GAO recommended that the Secretary of Defense direct the Secretaries of the Army and Air Force to establish procedures that will identify vacant positions in other National Guard and Reserve components when no position exists in the Reservist's own component. (p. 82/GAO Draft Report)

Now on p. 49.

DoD COMMENT: Partially concur. The DoD agrees that a system like that recommended by the GAO would be desirable. Given the lack of automation in the Reserve components of the Army, however, procedures to identify vacant positions in other National Guard and Reserve Components are not feasible at this time. After the Reserve Components Automation System is fully operational in the Army (FY 1996), this recommendation will be re-examined.

RECOMMENDATION 8: The GAO recommended that the Secretary of Defense direct the Secretary of the Navy to establish a relocation program to assist relocating Reservists to find unit positions near their new place of residence. (p. 82/GAO Draft Report)

DoD COMMENT: Partially concur. While the Department of the Navy does not have a formal relocation assistance system for members of the Naval Reserve and Marine Corps Reserve, the Naval Reserve and Marine Corps Reserve do provide informal assistance to members who relocate. It would not be prudent to develop and maintain a formal relocation system at this time, in light of more urgent Naval Reserve and Marine Corps Reserve automation priorities.

RECOMMENDATION 9: The GAO recommended that the Secretary of Defense develop a uniform policy for dealing with nonparticipating Reservists, which recognizes that Reservists are part-time volunteers and provides for standard disposition procedures. (p. 82/GAO Draft Report)

Now on p. 49.

DoD COMMENT: Concur. The DoD currently is revising DoD Directives 1215.5 and 1215.13, and incorporating them into a single Directive covering participation policies and procedures. The new Directive will establish the criteria and requirements for satisfactory participation by members of the Reserve Components and outline actions to be taken when participation is unsatisfactory. The policies included in the revised Directive will be based, in significant part, on an evaluation of the effect the activation of Reserve units and members in support of Operation Desert Shield has on service in the Selected Reserve and on patterns of attrition. Following that assessment, the DoD will distribute the new Directive for formal coordination. The Directive is expected to be implemented by the end of FY 1991.

GAO Comments

1. We have revised the text to show that the losses shown reflected all types of losses. Page 16 provides a detailed breakdown of the losses by type and by component. We do not share DOD's belief that the comparisons of loss rate by component have little meaning. These comparisons show where the changes are occurring, the extent to which the components know the reasons for losses, and the degree to which the losses are manageable.

2. While we recognize that DOD and the reserve components do have a variety of data bases with attrition information, we found that the accuracy of that data was problematic.

3. While aggregate losses may be useful for some policy analysis, we continue to believe that unit losses are a more important measure of attrition in the reserve components because reservists cannot be easily transferred between units to make up shortages. In its report on the 6th Quadrennial Review of Military Compensation, DOD questioned the usefulness of aggregate losses to the Reserve components.

4. We have revised the text to show key differences between reserve service and having a second civilian job, as well as the similarities. It was not our intent to imply that service in the reserves is completely analogous to a second job.

5. While DOD indicated that its analyses showed that bonus programs were effective for prior service personnel, the only study it cited was a 1989 study of the success of the affiliation bonus in increasing the likelihood of prior service personnel joining the reserves. However, our finding referred to the lack of effectiveness of bonus programs in retaining personnel, not attracting them.

6. We cannot comment on the issue of immediate availability of Montgomery G.I. Bill benefits since a detailed assessment of that program was beyond the scope of our review.

7. We have revised the text to incorporate this information.

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