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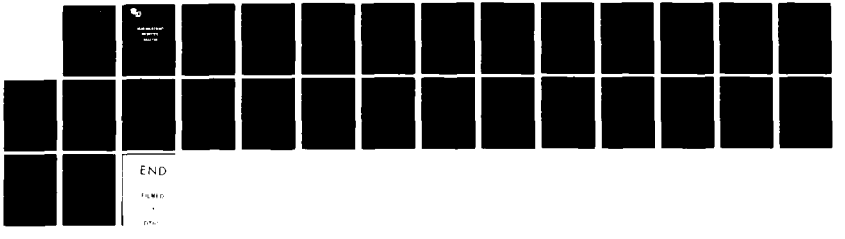

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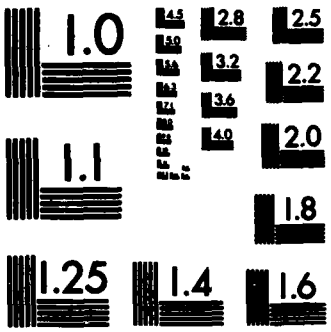

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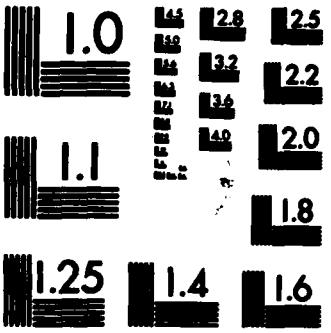

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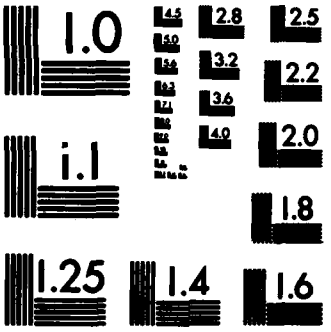

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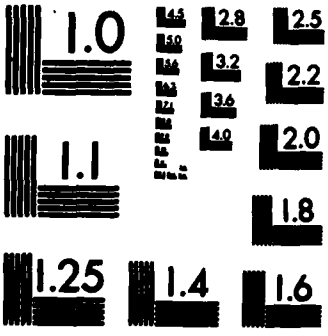

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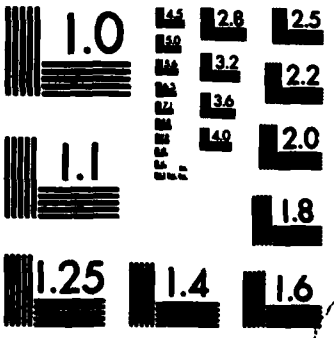

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United States Army
Recruiting Command

USAREC SR 82-3 AD _____

USAR ENLISTMENT INCENTIVES ANALYSIS

BY

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September 1982

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Program Analysis and Evaluation Directorate
Fort Sheridan, Illinois 60037

USAR ENLISTMENT INCENTIVES ANALYSIS

Study Report 82-3

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U.S. ARMY RECRUITING COMMAND
Research Studies and Evaluation Division
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ABSTRACT

All MOS within a USAR bonus unit receive a bonus for entry level enlistments, while only certain MOS in non-bonus units are authorized an enlistment bonus. This paper analyzes the fill rates for the bonus and non-bonus units and differences in fill rates (and shortages). The initial findings suggests that further extensive analysis is needed to determine a policy of enlistment bonus which is consistent with achieving the objective of increasing fill in selected MOS and selected units. The paper discusses statistical tests which indicate little, if no statistical difference in fill rates in bonus and non-bonus units for bonus and non-bonus MOS. The paper concludes with recommendations.

TABLE OF CONTENTS

ANALYSIS OF RESERVE ENLISTMENT BONUS

1. DATA.

a. The data used in the analysis discussed herein consists of 272 MOS with the following characteristics:

(1) Bonus and non-bonus units.

(2) Skill level 10 enlistments (entry level).

(3) Primary MOS authorized and assigned.

(4) US Army Reserve (USAR).

(5) Data reflects USAR conditions as of 12 Aug 82.

b. As shown in Appendix 1, nine Career Management Fields (CMF) are authorized an enlistment bonus. A total of 77 MOS within these CMF are eligible for the enlistment bonus.

2. ANALYSIS. In determining the effects of bonuses on fill rates, consideration had to be given to bonus units vs non-bonus units. All MOS within a USAR bonus unit receive a bonus for entry level enlistments, while only certain MOS in non-bonus units are authorized a bonus. Accordingly, paragraph 'a' below will consider only non-bonus units, paragraph 'b' below will consider only bonus units, and paragraph 'c' below will consider statistical differences between bonus and non-bonus units. To facilitate discussions of bonus unit fill rates, shortages, authorizations, etc., vs non-bonus unit data, the designations defined in Figure 1 will be used. Thus, hereafter, BM and BNM will refer to bonus units, and NBM or NBNM will refer to non-bonus units. The M or NM suffix refers to bonus or non-bonus MOS.

a. Non-bonus (NB) Unit Analysis.

(1) There are a total of 30,564 authorizations for NB units, representing 27.7 percent of the entire entry level authorizations for the USAR. The actual strength of 21,541 represents 23.1 percent of the actual assigned entry level individuals in the USAR (by primary MOS).

(2) Of the 77 bonus MOS, 36.8 percent (28) have no authorizations in the NB units (see Appendix 2). Of these 28, 14 have a total of 26 individuals assigned. These 28 MOS represent bonuses which have been paid or which will be paid if they continue to remain on the bonus list. Removing them from the bonus list will not affect B units. Since these MOS have no requirements (authorization), they should be taken off the list of bonus MOS.

(3) In addition to the MOS for which there are no authorizations on the USAR level, as shown in Appendix 3, for two examples, some Region Recruiting Commands (RRC) also have no authorizations for certain MOS. However, other RRC have authorizations and shortfalls in the same bonus MOS. In the aggregate, 13F10, for example, shows an authorized level of 46 spaces with 5 actual. However, 45 of the 46 are for NERRC. In cases like these, payment of a bonus based upon total USAR requirements results in payment of bonuses within RRC which may not be required.

Figure 1. Bonus MOS and Non-Bonus Unit Relationship

	Bonus Unit	Non-Bonus Unit	
Eligible for MOS Bonus	BM	NBM	M Bonus
Not Eligible for MOS Bonus	BNM	NBNM	NM Bonus
	B Unit	NB Unit	

Notes:

1. Only NBNM does not receive a bonus.

2. NBM receive a bonus, even though they are in a non-bonus (NB) unit.

3. BNM receive a bonus because they are in a bonus unit, but would not have received a bonus because they are in a non-bonus MOS (NM).

4. BNM receive a bonus because they are in a bonus unit even though the MOS is a non-bonus MOS (NM).

5. See Appendix 5 for authorized and actual fills for each cell in Figure.

The point is: total USAR requirements does not adequately reflect the picture of needs of the individual geographical area. This results in paying bonuses for which there are no unit authorizations just because the MOS is a bonus MOS.

(4) A similar problem with USAR totals and averages can be demonstrated in Appendix 4. For MOS 91B1, all RRC in B and NB units are over the authorized level. If a policy were to be adopted which would temporarily eliminate the bonus for this MOS until the actual equals the authorized level, SERRC, which is only 0.7 percent over its authorization, could experience a large shortfall (authorized level is 209). On the other hand, WRRC, which is 277.8 percent over its authorization of 18, would experience little shortfall. The problem with additive measures of effectiveness is that they are compensatory. The second example of Appendix 4 can better illustrate the results of compensatory measures. For MOS 11B10, the total over authorization is 124, which is 25.2 percent of the authorized level. Thus, based upon either the aggregate or average number, policy directed towards eliminating this MOS as a bonus might exaserbate NERRC shortfall. Also, a single RRC with a large shortage may, on the average, prompt a policy toward adding the MOS to the bonus list. If the bonus helped the one RRC with a high shortfall increase its fill, it would also cause other RRC to unnecessarily pay bonuses in a MOS which is at its assigned level.

b. Bonus (B) Unit Analysis.

(1) There are a total of 79,809 authorized spaces for the B units. The actual strength is 90 percent of the authorized level. B units account for 72.3 percent of all USAR authorized primary MOS spaces and 76.9 percent of the actual USAR entry level strength.

(2) Appendix 5 illustrates that bonuses in either B or NB units does increase fill rates. However, caution should be taken in using this information. This data is the result of compensatory aggregation not only within a specific MOS, but also across MOS. Thus, the shortfall of one MOS can be compensated for by a surplus in another. However, the numbers do suggest that, on the USAR level, B and NB units do have higher fill rates. Statistical tests to determine the significance of the difference between B and NB shortfall rates follow.

c. Statistical Tests.

(1) There are many statistical tests which could be used for the analysis of B vs NB units. One test, the T test for paired observations, is used in Appendix 6. The purpose of this statistical test is to determine if there is any difference in shortfall rates between BNM and NBNM. The Appendix defines the statistical test, the hypotheses, the calculations, and the results. The data consists of 68 MOS from B and NB units (eah being a paired observation) for which the B unit had an authorized strength of 100 or more. These 68 MOS constitute 90 percent of the authorized strength of the NBNM units. The corresponding percentage for BNM units is 96 percent of the authorized strength.

The conclusion from the preliminary analysis of Appendix 6, is that giving all members of a B unit an enlistment bonus does not statistically decrease the shortfall of the unit when compared to NB units. Although there is some improvement (3.67 percent on the average), the shortfall (and hence fill rate) is not much different than NB units on the average. Thus, it should be concluded that a policy of selected bonuses within B units should be adopted. Bonuses should be discontinued in units where the MOS has the same shortfall level in both BNM and NBNM units. Again, as in NB units, variations in RRC can be observed. Also, as in the NB unit analysis, aggregate measures are compensatory and tend to create policy which exaserbates shortfall problems of one geographic area which does not conform to the norm (average).

(2) An analysis similar to the above was performed on BM and NBM units. The data pair consists of the shortage rates (equation 4 in Appendix 6) for BM and NBM unit MOS where the B unit authorized strength exceeds 100. For the B units, the 24 pairs constitute 95 percent of the authorized strength for the BM units. For the 24 NB units, the corresponding value is 92 percent. The results of the analysis shown in Appendix 7 suggests that B units have statistically lower shortfalls than NB units in MOS which even the NB units can give enlistment bonuses to. This could be an indication that B units which, constitute 72 percent of total USAR authorized entry level authorizations, draws individuals away from NB units. Clearly, further analysis is needed here.

(3) The final set of analyses consists of a series of t tests on the difference between means for various combinations of B, NB, M, and NM. The statistical tests, analyses, and results are given in Appendix 8. All tests show no significant difference in shortfall no matter which combination of B, NB, M, or NM is selected. Although there are differences in the means of the various tests, the differences in means are not statistically different from zero.

(4) Some insight can be gained into the problem of the lack of statistical differences in the various tests by examination of Appendix 9. Although this data is aggregated at the RRC level, it does illustrate that a large variation in shortfall can be found from one RRC to another. If this large variation which is exhibited between the RRC exceeds the variation which is present within the RRC, the results of analyses on the USAR level would result in non-significant tests since the standard deviation has been increased by the large between RRC variations. When time permits, tests should be conducted to reduce the between RRC variation and to determine a better method for the determination of bonus MOS and unit effectiveness on an RRC or other geographical unit basis.

(5) As in NB units, RRC differences in fills can be seen. Appendix 10 illustrates several examples of selected RRC where a bonus is not appropriate even for a B unit (because the RRC has none authorized). It also illustrates the effect on low fill units if a USAR policy based on an average is used.

Clearly, some RRC are paying a bonus to MOS which are over the authorizations within the RRC.

(6) Further data on bonus in B units is provided in Appendix 11. Item 3-c of Appendix 11 suggests that similarities in fill rates can be found between B and NB units. This would suggest that a methodology should be developed which uses the similarities and incorporates the geographical unit (RRC, DRC or Army).

(7) As shown in Appendix 12, several NB unit MOS have much higher shortfall than the corresponding MOS in B units. It could be reasoned, therefore, that the enlistment bonus does have an effect of increasing fill rates (decreasing shortage rates). However, without accession data, the change in rates cannot be predicted accurately.

3. SUMMARY. The initial findings presented herein suggests that further extensive analysis is needed to determine a policy of enlistment bonus which is consistent with achieving the objective of increasing fill in selected MOS and selected units. This methodology should incorportate geographical units, fill rates in units which exceed authorizations, and differences in MOS requirements or different units.

4. CONCLUSIONS.

a. The number of bonus MOS can be reduced by 36.8 percent by eliminating those MOS which have no authorizations in non-bonus units.

b. Bonus and non-bonus unit fills vary depending upon the individual RRC.

c. The use of compensatory or aggregate measures will tend to widen the disparity in fill rates between MOS or units requiring a bonus and those not requiring a bonus.

d. Enlistment bonuses are being given to bonus and non-bonus units in MOS that are over authorized strength.

e. The practice of giving a bonus to all bonus unit enlistees does not increase the fill rates of bonus units over non-bonus units in MOS not authorized a bonus in a non-bonus unit.

f. Shortfall rates are significantly reduced in bonus units in the MOS for which non-bonus units also give a bonus.

g. Fill rates alone are not adequate in determining the effect of bonus policy.

5. RECOMMENDATIONS:

a. MOS listed in Appendix 2 should be eliminated from the enlistment bonus eligible MOS.

b. Bonus MOS should be determined on the basis of geographic MOS shortages. The geographicical unit could be RRC, DRC or Army.

c. Only when adequate geographical units have been defined should aggregate, compensatory measures be used to determine bonus eligible MOS for non-bonus units.

d. Enlistment bonuses in non-bonus units should be dynamically determined, based upon:

(1) Geographical requirements (e.g. RRC, DRC, or Army).

(2) A rule which provides "protection" to units having lower than average fill rates. One such rule would be a "start and stop" rule to determine when a bonus for a specific MOS in a geographical area should stop paying a bonus, and when it should start paying a bonus depending upon the fill rate.

e. All MOS within a bonus unit should not receive an enlistment bonus. The bonus should be given only if it is demonstrated that:

(1) The MOS is a priority MOS and shortages would seriously damage the unit's capability.

(2) There is a need for a specific MOS to have a bonus in a bonus unit (e.g. there exists significant shortfalls in strengths within the geographical unit).

(3) There is evidence that the bonus increases enlistments in the MOS (compared to an MOS in a non-bonus unit).

f. Further analysis of the relationship betweeen enlistment bonuses and fill rates should be undertaken:

(1) Field test of certain MOS (priority or high authorization) to determine elasticities of the enlistment bonus.

(2) Further analysis of reserve accession and unit authorization data.

Appendix 1

Current Bonus MOS

Career Management Field (CMF): 11, 12, 13, 16, 19, 91, 54, 98, 95B

Specific MOS in CMF:

CMF	MOS*
95B	95B
11	11B, 11C, 11H, 11M
12	12B, 12C, 12E, 12F
13	13B, 13C, 13E, 13F, 13M, 13R, 13W, 13Y
	15D, 15E, 15J
	17B, 17C
	82C
	93F
16	16B, 16C, 16D, 16E, 16G, 16H, 16J, 16P, 16R, 16S, 16T
19	19D, 19E, 19K
91	35G, 35U
	42C, 42D, 42E
	71G
	91B, 91C, 91D, 91E, 91F, 91G, 91H, 91J, 91L, 91N, 91P,
	91Q, 91R, 91S, 91T, 91U, 91V, 91W
	92B, 92E
	01H
54	54C, 54E
	94D
98	98C, 98G, 98J
	05D, 05G, 05H, 05K

* 12Z, 13Z, 16Z, 54Z and 98Z are also included in the CMF above. 'Z' implies supervision position. Thus, there can be no 16Z10, for example, since 10 is the entry skill level.

Appendix 2

Recommended MOS Bonus Elimination*

MOS	CMF	NUMBER ASSIGNED
13C10	13	2
15D10	13	1
15E10	13	1
16B10	16	1
16C10	16	2
16D10	16	2
16E10	16	3
16P10	16	6
16R10	16	2
19K10	19	1
92E10	91	1
05D10	98	1
05K10	98	2
98J10	98	1
11M10	11	0
12E10	12	0
12F10	12	0
13M10	13	0
13W10	13	0
13Y10	13	0
15J10	13	0
16F10	16	0
16G10	16	0
16H10	16	0
16J10	16	0
16T10	16	0
94D10	54	0
01H10	91	0

* Based upon analysis of authorization levels for USAR entry level (skill level 10) authorizations for bonus and non-bonus units. These MOS all have no authorized positions.

Appendix 3

Remove MOS Bonus From Non-Bonus Units

MOS	RATIONALE
42E1	Authorization for SWRRC is for two only. The SWRRC is also at its authorized level for this MOS. SERRC and NERRC also have one assigned (0 authorized).
91H1	WRRC is only RRC authorized but has none assigned. NERRC, SERRC, and MWRRC each have none authorized, but each have one or more assigned (total assigned is four).

Appendix 4

Restrict MOS Bonus For Non-Bonus Units

MOS	RATIONALE
91B10	All RRC are over authorized. Average is 44.4 percent over the authorized level (total of 549 is authorized with 244 over the authorization level).
11B10	All but NERRC are over the authorized level. A total of 493 is authorized with 102 over the authorized level.

SWRRC	WRRC	MWRRC	SERRC	NERRC
-14	-50	-21	-56	+39

(Negative value means the RRC is over its authorized level by the amount shown.)

Appendix 5

Analysis of USAR Bonus Units (Skill Level 10)

1. Non-Bonus units, Non-Bonus MOS (NBNM):

Authorized Strength	22,179
Actual Strength	15,076

Fill rate in non-bonus units without MOS bonus is 68 percent.

2. Non-Bonus units, MOS Bonus (NBM):

Authorized Strength	8,385
Actual Strength	6,469

Non-Bonus unit fill rate with MOS bonus is 77 percent.

3. Bonus units and MOS which would receive a bonus in non-bonus units (BM):

Authorized Strength	23,830
Actual Strength	20,164

Bonus unit MOS fill rate is 85 percent.

4. Bonus unit and MOS which would not receive a bonus in non-bonus units (BNM):

Authorized Strength	55,979
Actual Strength	51,730

Bonus unit fill rate in MOS not receiving bonus in non-bonus units is 92 percent.

5. Total entry level authorizations is 110,373.
   Total actual strength is 93,439.
   Total number eligible for a bonus is 79.9 percent.

Appendix 6

Test of Difference in Shortfall Rates Between Bonus Units and Non-Bonus Units for MOS Not Authorized Bonus in Non-Bonus Units (BNM and NBNM).

1. Statistical Test: The statistical test is a T Test for paired observations. Paired data are shortfall rates for bonus and non-bonus units where the bonus unit authorized strength exceeds 100 (entry skill level 10). The test statistic is found using the following:

$$t_{test} = \frac{\bar{d}}{S_{\bar{d}}} \qquad (1)$$

where t_{test} = test statistic,

$\bar{d}$ = average deviation (difference) between pairs,

$S_{\bar{d}}$ = standard deviation of differences between paired observations means.

$$S_{\bar{d}} = \frac{S_d}{\sqrt{n}} \qquad (2)$$

where S_d = standard deviation of differences between paired observations given,

n = number of paired observations.

$$S_d = \sqrt{\frac{(d-\bar{d})^2}{n-1}} \qquad (3)$$

where d is the difference between each paired observation.

$$\text{Shortfall rate} = \frac{\text{Authorized-Actual}}{\text{Authorized}} \qquad (4)$$

2. Hypothesis:

Ho: The paired observations come from the same population (d = 0 for each observation), or that there is no difference in shortfall rates between bonus and non-bonus units.

Ha: The paired observations come from different populations (d are not 0 for each observation).

Ho is the null hypothesis.
Ha is the alternate hypothesis.

To test the hypothesis, a critical value t_{crit}, is determined based upon the degrees of freedom (n-1) and a level of significance.

If t_{test} is greater than t_{crit}, Ho is rejected. Otherwise, Ho is accepted.

3. Calculations:

$$\bar{d} = 0.036758$$

$$Sd = \sqrt{\frac{5.056}{68-1}} = 0.2747$$

$$S_{\bar{d}} = \frac{0.2747}{\sqrt{68}} = 0.0333$$

$$t_{test} = \frac{0.036758}{0.0333} = 1.103$$

For 67 degrees of freedom (n-1), the critical t statistic is $t_{crit} = 2.61$ for the .01 level of significance.

a. Since t_{test} is less than t_{crit}, the Ho is accepted, and it can be concluded that there is no statistical difference in shortfall rates between BNM and NBNM.

b. The average difference in shortfall rate is 3.67 percent which is not statistically significantly different from 0.0. Thus, even though bonus units do receive a smaller shortfall (hence larger fill) rate, when compared to non-bonus units, the results are attributed to chance alone.

c. The average shortfall rate for BNM units is 12.38 percent. The average shortfall rate for NBNM units is 14.38 percent. Thus, although the BNM unit does have a lower shortfall rate than the NBNM unit, on the average, the added bonuses for all MOS in bonus units does not result in a statistically different shortfall rate for bonus units with authorized strengths (entry level) exceeding 100.

Appendix 7

Test of difference in fill rates between bonus units and non-bonus units for MOS authorized a bonus in non-bonus units (BM and NBM).

1. Statistical Test: Equations (1) through (4) of Appendix 6 are used to calculate t_{test}. The data used consisted of the shortfall rates for BM and NBM units where the BM unit authorized strength exceeds 100 (entry level skill).

2. Hypothesis: The same as Appendix 6 for the conditions listed above.

3. Calculations: $\bar{d} = 0.0383$

$$S_d = \sqrt{\frac{4.0638}{24-1}} = 0.4034$$

$$S_{\bar{d}} = \frac{0.303}{24} = 0.0078$$

$$t_{test} = \frac{0.0383}{0.0078} = 4.899$$

For 23 degrees of freedom (n-1), the critical t statistic is $t_{crit} = 2.807$ for the .01 level of significance.

a. Since t_{test} exceeds t_{crit}, the Ho is rejected and it can be concluded that there is a statistical difference in shortfall rates in BM and NBM units.

b. The average difference is 3.83 percent in shortfall. This means that BM units obtain a smaller shortfall than NBM units.

c. The average shortfall for BM units is 17.43 percent. The average shortfall for NBM units is 21.26 percent for MOS authorized strengths over 100 in bonus units.

Appendix 8

Other Tests of Significance of Shortfall Rates

1. Statistical Test: When sample sizes are not equal and data are not paired, a test of the difference between means can be used. The test statistic is found using the following:

$$t_{test} = \frac{\bar{x}_1 - \bar{x}_2}{S_{\bar{x}_1 - \bar{x}_2}}, \qquad (1)$$

where t_{test} = test statistic
$\bar{x}_1$ and $\bar{x}_2$ = sample means

$S_{\bar{x}_1 - \bar{x}_2}$ = Standard deviation of the difference between means as in equation 2.

$$S_{\bar{x}_1 - \bar{x}_2} = S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}, \qquad (2)$$

where n_1 and n_2 are the two sample sizes, and
s = pooled standard deviation of the samples as in equation 3.

$$S = \sqrt{\frac{(n_1-1)S_1^2 + (n_2-1)S_2^2}{n_1 + n_2 - 2}}, \qquad (3)$$

where S_1 and S_2 are the variances of the two samples.

Each sample consists of the shortfall rates (See (4) in Appendix 6 for various combinations of B and NB units with BM or NM MOS.

2. Hypothesis:

Ho: $M_1 - M_2 = 0$. (There is no difference in mean shortfall rates for the two populations from which the samples were taken.)

Ha: $M_1 - M_2 \neq 0$. (There is a difference in the mean shortfall rates.)

Ho is the null hypothesis.

Ha is the alternate hypothesis.

To test the hypothesis, a critical value, t_{crit}, is determined, based upon degrees of freedom ($n_1 + n_2 - 2$) and a level of significance.

If $|t_{test}|$ is greater than t_{crit}, Ho is rejected. Otherwise, Ho is accepted.

3. Calculations:

BM and NBNM

$n_1=24$ $n_2=68$

$\bar{X}_1=0.1743$ $\bar{X}_2=0.1239$

$S_1=0.4812$ $S_2=0.37$

$S = 0.3630$

$S_{\bar{x}_1-\bar{x}_2}=0.0855$

$t_{test}=0.589$

$t_{crit}=1.64$ (.10 level)

Since t_{test} less than t_{crit},

Accept H_0

NBM AND BNM

$n_1=24$ $n_2=68$

$\bar{X}_1=0.2126$ $\bar{X}_2=0.1276$

$S_1=0.2883$ $S_2=0.3012$

$S = 0.2695$

$S_{\bar{x}_1-\bar{x}_2}=0.06399$

$t_{test}=1.328$

$t_{crit}=1.64$ (.10 level)

Since t_{test} less than t_{crit},

Accept H_0

BM and BNM

$n_1=24$ $n_2=68$

$\bar{X}_1=0.1743$ $\bar{X}_2=0.1276$

$S_1=0.4812$ $S_2=0.3012$

$S = 0.3219$

$S_{\bar{x}_1-\bar{x}_2}=0.0764$

$t_{test}=0.611$

$t_{crit}=1.64$

Since t_{test} less than t_{crit},

Accept h_0

NBM and NBNM

$n_1=24$ $n_2=68$

$\bar{X}_1=0.2126$ $\bar{X}_2=0.1239$

$S_1=0.2883$ $S_2=0.37$

$S = 0.3174$

$S_{\bar{x}_1-\bar{x}_2}=0.0754$

$t_{test}=1.176$

$t_{crit}=1.64$

Since t_{test} less than t_{crit},

Accept H_0

B and NB Units (all MOS)		M and NM (all units)	
$n_1=92$	$n_2=92$	$n_1=48$	$n_2=136$
$\bar{X}_1=0.13979$	$\bar{X}_2=0.147016$	$\bar{X}_1=0.1935$	$\bar{X}_2=0.1257$
$S_1=0.352036$	$S_2=0.3490$	$S_1=0.5609$	$S_2=0.4771$
$S = 0.3505$		$S = 0.4018$	
$S_{\bar{x}_1-\bar{x}_2}=0.05489$		$S_{\bar{x}_1-\bar{x}_2}=0.06745$	
$t_{test}=-0.067$		$t_{test}=-1.01$	
$t_{crit}=-1.64$		$t_{crit}=-1.64$	
Since t_{test} greater than t_{crit}, Accept H_o		Since t_{test} greater than t_{crit}, Accept H_o	

a. For all tests above, H_o is accepted, and it can be concluded that, regardless of unit type (B or NB) or MOS type (M or NM) or any combination of unit or MOS, there is no statistical difference in shortfall rates in the USAR.

b. Inspection of the analyses above does show that there are differences in shortfall rates. A cause for the lack of significance of the tests is that the standard deviations are large relative to the average shortfall. This causes the test statistic to have lower values. As illustrated in Appendix 9, part of the reason for the large standard deviations is due to the between RRC variations, which is large relative to the within RRC variations in shortfall rates.

Appendix 9

RRC Shortfall Summary

1. B Units Shortfall*

NERRC	SERRC	WRRC	SWRRC	MWRRC
6.2%	0.9%	12.8%	20.6%	13.0%

2. NB Units Shortfall*

NERRC	SERRC	WRRC	SWRRC	MWRRC
15.5%	0.9%	23.4%	31.5%	28.7%

3. Summary Data

Unit type	average	standard deviation
B	10.7%	7.48
NB	20.0	12.29

* Within the RRC, shortfalls are compensatory. That is, one MOS over its authorized strength could compensate for another MOS shortfall. These figures are simply the ratios of the aggregate authorization level to the aggregate actual strength, which is the shortfall.

Appendix 10

Selected Bonus Unit MOS Adjustments

		NERRC		SWRRC		SERRC		MWRRC		WRRC	
CMF	MOS	AUTH	ASSIGNED	AUTH	ASSIGNED	AUTH	ASSIGNED	AUTH	ASSIGNED	AUTH	ASSIGNED
11	11B10[1]	989	794	331	375	18	366	941	699	347	435
	11C10[1]	174	125	33	33	0	14	159	76	59	54
	11H10[3]	152	67	2	23	0	10	163	51	51	24
13	13R10[2]	2	4	0	1	0	0	0	5	0	0
	17B10[2]	1	3	0	2	0	1	4	6	0	1
	17C10[2]	3	1	0	2	0	1	4	6	0	1
16	16S10[4]	43	0	0	1	0	0	0	0	0	1
19	19D10[6]	46	42	0	2	4	62	18	70	19	21
	19E10[5]	18	28	3	15	8	104	32	135	73	62
91	35G10[2]	9	23	8	14	2	14	4	16	4	6
	42C10[2]	0	0	0	2	0	4	0	3	0	1
	91B10[5]	864	1474	428	549	643	806	667	979	430	711
98	05G10	0	0	0	0	0	1	0	1	0	0

NOTES:

1. Drop MOS from bonus units in SERRC.
2. Drop MOS from bonus for bonus units only.
3. Drop MOS from bonus units in SWRRC and SERRC only.
4. Drop MOS from bonus for all bonus units except in NERRC.
5. Reduce number of bonuses given when actual exceeds authorized.
6. NERRC and WRRC only keep bonus.

Appendix 11

Bonus Unit Data Summary

1. 44 MOS with authorizations = 0 in bonus units; yet, combined assigned = 182.

2. 195 MOS in B units not authorized in NB units.
   77 MOS for NB units.
   272 total MOS in B units.

3. Of the 195 added MOS in B units:

   a. 30 MOS have Authorizations = 0, combined assigned = 130.

   b. 51 MOS met or exceeded authorizations. 39 non-bonus units also exceeded authorizations in these 51 MOS.

   c. 114 MOS had actual strength below authorized. Of these 114, 76 MOS were also understrength in non-bonus units.

Appendix 12

Additional Bonus MOS Analysis Requirements

1. Bonus and Non-bonus units and MOS will be referred by designations BM, BNM, etc., found in Figure 1.

2. The analysis needed to determine additional MOS bonus requires a means of determining elasticities for bonuses for selected MOS. The analysis suggests that an upper limit of about a 9 percent increase in fill rates results from enlistment bonuses overall. However, it also suggests that some BM experience somewhat higher fill rates than NBM. However, the analysis also suggests that there is no statistical difference between BNM and NBNM. What this implies is that adding another bonus MOS may not increase the overall fill of NB units because the bonus has not statistically increased fill rates (decreased shortages) in B units.

3. For B unit MOS, 44 of the BM MOS exceeded the fill rate for NBM units with the same MOS out of the 68 used in the analysis. As shown in Appendix 13, 30 MOS in the NBM units have fill rates less than the corresponding MOS in bonus units. If the MOS were added to the bonus MOS list, the third column indicates the expected shortfall in the MOS assuming that the bonus will bring the actual strength up to the same percentage fill as the BM unit MOS fill.

4. If more MOS bonuses were to be added to NBM units, they should be taken from the list in Appendix 13, using a priority structure for selection. It should also be noted that it is possible that not only the projected increase, but also the number currently authorized in the MOS, could receive the bonus, depending on how the time period in which the MOS fills and the time during which the bonus is given. No data is available (currently) to determine the MOS accession history. Thus, no recommendations on added bonus MOS can be given at this time.

Appendix 13

Non-Bonus Unit Projected Increase IF Bonus MOS

MOS	Non-Bonus Unit Current Shortfall	% Bonus Unit Shortfall	Projected Increase*
05C1	21	1.7	17
43E1	84	39.4	19
43M1	46	38.9	8
44E1	23	15.8	8
51B1	156	14.8	70
51R1	227	20.0	133
52C1	37	13.3	24
52D1	78	36.1	16
57F1	24	40.7	1
57H1	22	22.7	8
61B1	29	24.2	13
61C1	19	17.3	10
62B1	77	4.7	44
62E1	123	1.7	111
62J1	120	16.9	65
63H1	16	20.3	4
63J1	39	31.5	7
63W1	7	0.0	7
64C1	133	0.0	133
71C1	20	19.7	5
71M1	54	32.2	24
71N1	14	0.0	14
75C1	30	0.0	30
75D1	32[illegible]	16.9	218
75E1	111	37.1	43
76C1	81	6.1	49
76D1	83	100.0	0
76J1	54	12.6	32
81B1	15	3.4	11
94F1	36	33.9	6

*If the non-bonus unit received a MOS bonus and achieved the same shortfall as the bonus unit MOS.

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All MOS within a USAR bonus unit receive a bonus for entry level enlistments, while only certain MOS in non-bonus units are authorized an enlistment bonus. This paper analyzes the fill rates for the bonus and non-bonus units and differences in fill rates (and shortages). The initial findings suggests that further extensive analysis is needed to determine a policy of enlistment bonus which is consistent with achieving the objective of increasing fill in selected MOS and selected units. The paper discusses statistical tests which indicate little, if no statistical difference in fill rates in bonus and non-bonus units

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for bonus and non-bonus MOS. The paper concludes with recommendations.

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