CAB D0010240.A2/Final
June 2004

# Evaluation of the Assignment Incentive Pay (AIP) System

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Approved for distribution: June 2004

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## Executive Summary

In June 2003, the Navy began offering Assignment Incentive Pay (AIP) to select billets in hard-to-fill locations. N13 tasked CNA with analyzing various aspects of the experiment. This annotated briefing summarizes that analysis.

Sigonella, Naples, and Misawa were the first locations chosen for the experiment. Because they have the longest experience with AIP, we confined our analysis to these locations. Misawa was a Type 6 duty (overseas shore) both before and after AIP, while Sigonella and Naples were Type 3 before AIP (overseas shore duty receiving sea duty credit) and were converted to Type 6 after the experiment began.

Our analysis has shown that AIP has been very cost-effective. Because of the elimination of the costs associated with offering sea duty credit for jobs in Sigonella and Naples, the savings are greatest in these locations. In particular, previous CNA analysis determined that converting Type 3 billets to Type 6 provides the opportunity to outsource approximately 1.6 shore billets for every billet converted. For non-NCTAMS* jobs, we calculate that these outsourcing savings in Sigonella and Naples are at least 7 times as great as the costs. And for NCTAMS jobs, the ratio of savings to costs is 2.8.

The savings that accrue from offering AIP in Misawa include, at the least, retention savings from increasing the rate of volunteerism for these jobs. An estimate of these savings is beyond the scope of this study. However, we note that the average winning bid for all ratings with voluntarily assigned Sailors in Misawa is at or below $150 per month, with 4 exceptions, involving just 15 Sailors.

We also analyzed whether differences exist in application rates and fill rates for AIP jobs based on job characteristics and level of AIP cap. Our analysis indicates that larger incentives are necessary to fill jobs in certain ratings, but larger incentives are not necessary across paygrades. We also find that, all else equal, Sigonella requires higher caps than either Misawa or Naples.

NCTAMS jobs have been the most difficult to fill to date, and our analyses indicate that they require the largest AIP incentive to attain a fill rate that is comparable to other jobs in these locations. It is clear that the cap on these jobs to date has not been high enough to ensure adequate volunteerism. In the short term, we recommend that the Navy increase the cap on all NCTAMS jobs to the congressional limit of $1,500. However, the Navy needs to determine the breakeven point at which the cost of AIP to voluntarily assign Sailors exceeds the benefits. If shore jobs in these ratings are good candidates for outsourcing, this breakeven point is on the magnitude of $2,200 per month, and Congress would need to increase the caps.

We also propose a method by which application activity could be examined on a continuing basis to help determine whether AIP cap adjustments are necessary. Such a

* NCTAMS stands for Naval Computer And Telecommunications Area Master Station.

metric would have been especially useful when the AIP experiment first began, when there were few data on which to base cap adjustments. For instance, our proposed metric would have highlighted categories of jobs that experienced difficulty in attracting bids or in being filled and that continued to experience difficulty, such as the NCTAMS jobs, as well as all IT jobs. This metric is an initial step in determining whether caps should be raised for categories of jobs, with subsequent vetting required that takes into account priorities, PCS funds, manning, and so on.

Next we calculated the cost-effectiveness of various lump-sum payment schemes as an alternative to the present monthly AIP payment scheme. Our analysis has shown that paying Sailors a lump sum for AIP up front may be more cost-effective to the Navy than comparable monthly payments. However, our analysis does not take into consideration the cost of Sailors leaving their AIP billet prematurely, or how the Navy could recover a prorated award in such an event.

Since Type 3 jobs are the most expensive to the Navy, in terms of reduced sea manning and other costs, we recommend that the Navy consider converting more Type 3 billets to AIP before any other billet conversions. In particular, converting those with the greatest proportion with at least one applicant will most likely result in the greatest net savings. Our analysis provides a listing of these.

Our analysis shows that all ten of the current non-AIP Type 6 locations with the lowest application rate are in Japan. We recommend, therefore, that they be considered for AIP before other Type 6 locations.

Finally, because only Sailors who apply online via the Job Advertising and Selection System (JASS) may apply for AIP jobs, we looked at whether access to JASS appears to be restricted for certain categories of Sailors, particularly those serving overseas or who are on sea duty. We concluded that, although access is not restricted, Sailors prefer to negotiate directly with detailers when applying for jobs. This could benefit AIP if detailers, in those conversations, recommend that Sailors consider applying to AIP jobs.

# Evaluation of the Assignment Incentive Pay (AIP) System

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The Navy has long faced shortages in certain critical shore billets. A variety of methods have been used to fill these billets, including involuntary assignments and sea duty credit for rotational purposes. However, these methods are inflexible, affect endstrength, and reduce retention. To better alleviate shortages in hard-to-fill billets, the Navy began offering Assignment Incentive Pay (AIP) in three locations in June 2003.

AIP levels are determined by a market-based system; Sailors submit the amount of pay they require to volunteer for less preferred locations. Sailors submit their bids along with their applications and application preferences in the Job Advertising and Selection System (JASS). Submitted bids are constrained only by AIP caps set by the Navy. These caps vary by location, by paygrade, and, in some cases, by rating. At the end of the job cycle (about 2 weeks in length), detailers review all applications for each billet and select the Sailor with the lowest AIP bid from all who are qualified for the billet. If selected, Sailors begin receiving their stated monthly AIP upon arrival at their new assignments.

The Navy implemented AIP as a pilot program to allow for system adjustments and ongoing evaluation. Since its implementation, the main adjustments have been increases in AIP caps and the addition of new AIP-eligible locations. To support the AIP pilot program, the Director, Military Personnel Plans and Policy Division (N13), asked CNA to provide ongoing evaluation of the AIP system. This annotated briefing summarizes our analysis of the effectiveness of AIP.

## Our Analysis

- Overall JASS application rates
- AIP application and fill rates
  - How do they vary by paygrade, rating, location, type of job?
  - How effective is raising the cap?
- Other potential AIP locations
- Proposed cap adjustment tool
- Lump-sum versus monthly AIP payments
- Overall cost-effectiveness of AIP

In this annotated briefing, we focus on several factors related to AIP. Because only those Sailors who apply on JASS are eligible for AIP jobs, we determine whether significant differences exist in the level of JASS use. We are especially concerned with whether access to JASS appears to be restricted for certain categories of Sailors due to such factors as their location or type of duty.

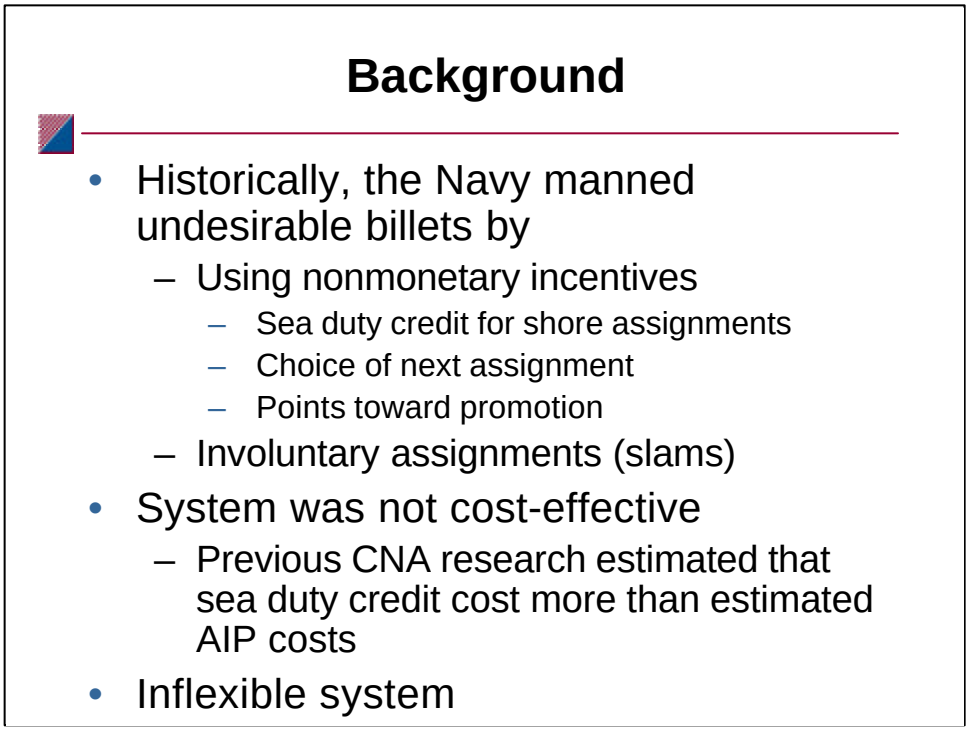
We then turn to an analysis of differences in application rates and fill rates for AIP jobs since AIP was first implemented. We examine (a) whether AIP jobs are successful in attracting applicants and, ultimately, in being filled; (b) whether differences exist in the fill rates of AIP jobs based on their characteristics (especially location, rating and paygrade); (c) whether increases in the AIP cap are related to increasing applications and/or the fill rate; and (d) whether the cap should vary by other ratings or job characteristics. Using similar analysis, we look at other Type 3 and Type 6* locations to determine which may make good candidates for future AIP locations.

The AIP caps have been changed numerous times since the experiment began, with adjustments made sometimes to whole locations, to just certain paygrades, and/or to certain ratings that appear to be experiencing the lowest bidding behavior. But it has yet to be determined precisely how the Navy can determine which, if any, jobs need a cap adjustment, or when such an adjustment should be made. Therefore, we present a method by which application activity could be examined on a continuing basis to help determine whether AIP cap adjustments are necessary.

*For reference, Type 1 jobs are continental United States (CONUS) shore duty; Type 2 are CONUS sea duty; Type 3 are outside CONUS (OCONUS) shore jobs that are given sea duty credit; Type 4 are OCONUS sea duty; and Type 6 are OCONUS shore duty.

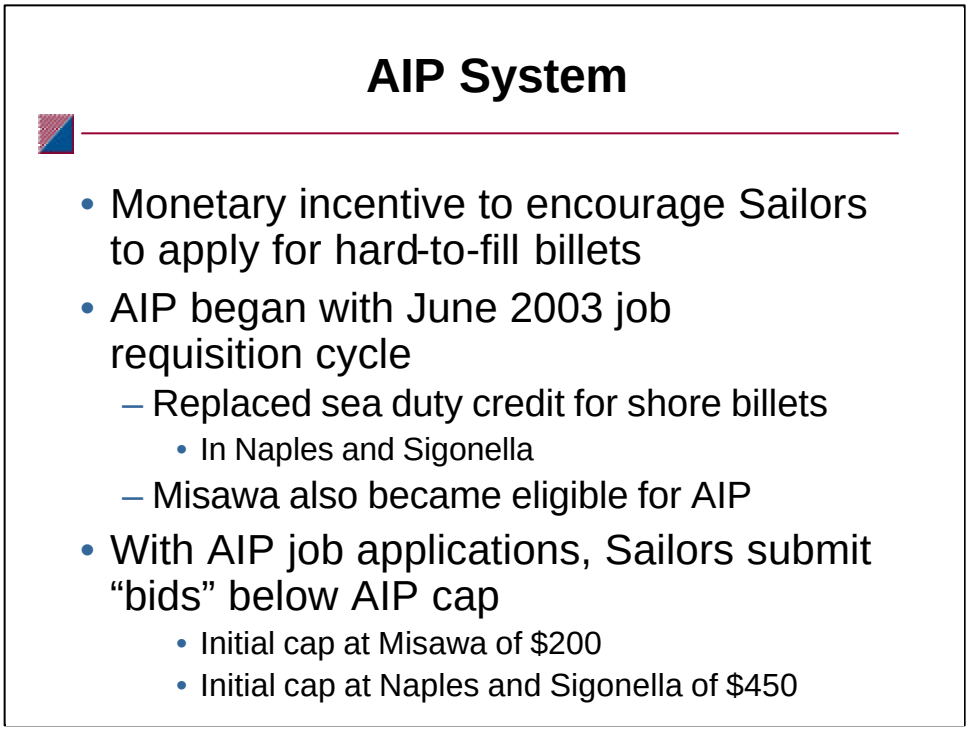
Currently, AIP is paid in equal monthly payments for the duration of the tour. We look at the cost-effectiveness of various lump-sum payment schemes as an alternative in the next section.

We conclude with a discussion of the overall cost-effectiveness of AIP to date.




Over the years, the Navy has offered a number of incentives to alleviate shortages in certain critical billets. Some recent incentives for hard-to-fill shore billets have included the promise of a future preferred assignment and sea duty credit for rotational purposes. If these critical billets were not filled, Sailors were assigned to them involuntarily (slammed). The main problems with this system are that (1) the actual cost of filling these less preferred billets is not revealed, (2) sea duty credit for rotational purposes reduces Navy readiness and has to be compensated with higher endstrength, and (3) retention was lower among Sailors who were slammed [1]. In addition, it was difficult to change the system in response to short-term shore billet manning requirements.

Although the true cost to the Navy of the previous system was not known, research suggested that it was not cost-effective. Previous CNA analysis found that the cost of the existing system could be viewed as either (1) a cost to the Navy of at least $195 million annually for the higher endstrength necessary to support sea duty credit to overseas shore billets, or (2) $83 million in sea pay annually to offset the fleet readiness loss from the use of sea duty credit as an assignment incentive [2]. Because of the previous system's shortcomings, the Navy developed AIP to mitigate shore manning shortfalls, decrease turnover in these critical billets, increase retention, and increase flexibility in the assignment process.




The AIP system was implemented with the June 21, 2003, job requisition cycle. Naples and Sigonella, which had been Type 3 duty locations, became Type 6 duty with AIP, while Misawa remained Type 6. Beginning in November, the Navy gradually added some Unit Identification Codes (UICs) in Guam, Sasebo, Yokosuka, Lemoore, and Italy (some of which were Type 2 or Type 4 duty) to become AIP eligible.

The Navy designates AIP-eligible billets and sets an AIP cap for each billet, which, by law, must be no greater than $1,500 per month. Originally, the Navy based the cap on a job's location and paygrade, but it has since offered higher incentives for certain types of jobs, particularly NCTAMS* jobs for ITs in Naples.

A Sailor may submit a bid for an AIP job that is below the AIP cap (including a bid of $0). Applications for AIP jobs, unlike all non-AIP jobs, must be made on JASS. When AIP was implemented, the largest Navy AIP cap was $450. With the December 20 requisition cycle, the largest Navy AIP cap became $1,200. Sailors apply to AIP billets stating the monthly incentive that they require to prefer that AIP billet over other billets. The AIP system is closed bid, meaning that bids are only revealed to the detailer making the selection decision. At the end of each 2-week requisition cycle, a detailer selects a Sailor with the lowest bid from all qualified applicants. Qualifications are based on paygrade, NEC requirements, and so on, and can also depend on current policy concerning Permanent Change of Station (PCS) funds. When funds are restricted, detailers must disqualify Sailors based on their estimated PCS costs, even if their bids are lower than those of other Sailors. The Navy pays AIP in monthly installments for the duration of the tour.

*NCTAMS stands for Naval Computer And Telecommunications Area Master Station. ITs in these jobs often work significantly longer hours than most other shore duty jobs require.

Of the more than 950 Sailors who have been selected for AIP jobs since AIP began, through the first cycle in March 2004, 42 have been involuntarily assigned, or slightly over 4 percent.*

Before we analyze AIP jobs directly, we look at application activity on JASS, since, unlike all other jobs, Sailors may only apply for AIP jobs directly on JASS.

*Data on involuntary assignments were provided by Pers 401.

## Who Applies on JASS?

- Why does it matter?
  - Only those who use JASS can apply for AIP jobs
  - Low bidding rates for AIP jobs may be improved by increasing JASS use
- Data limitations limit analysis
  - We can only look at applications, not views
- Issues
  - Has the JASS application rate increased with AIP?
  - Is there an access issue?

For all jobs except AIP, Sailors may negotiate directly with a detailer, but AIP jobs can only be filled by Sailors who apply on JASS.* It is important, therefore, to understand who uses JASS and to determine whether the rate of use has increased since AIP was implemented. If a disproportionate number of AIP jobs in certain paygrades or ratings do not receive bids, an increase in bidding activity may be achieved by encouraging more Sailors to use JASS. In addition, we want to understand whether certain categories of Sailors appear to have difficulty in accessing JASS, for example, because they are deployed or are outside the continental United States (OCONUS).

Ideally, we would like to measure the full spectrum of JASS use, from the lowest level (i.e., those who never use JASS at any level), to those who use JASS only to become knowledgeable about the kinds of jobs available but never apply for jobs on JASS, to those who occasionally apply on JASS, and finally to those who use JASS exclusively to apply for all jobs. Unfortunately, due to data limitations, we can only measure JASS use that includes those who make at least one application on JASS. This limits our analysis because it means that we cannot identify the absolute level of JASS use, and we can only evaluate relative differences in application rates across various Sailor characteristics or over time. More important, we cannot extrapolate our findings to determine whether AIP jobs in a particular paygrade, sea/shore code, or rating receive relatively few applications because Sailors are not using JASS, or because they are viewing the jobs on JASS but do not find the AIP jobs to be desirable. We will address these issues in a separate analysis to be discussed later.

* We have full information concerning application behavior and fill rates for AIP jobs, but not for all other jobs. This makes it virtually impossible to compare the success of AIP relative to non-AIP jobs in the period since AIP began, and of AIP jobs before and after AIP was implemented.

## Sample Used for Analysis

- Sailors E4 and above with 9 to 10 months to PRD at the end of March, June, or September
- Followed them for 6 months
- Selected only those with orders
  - Minimizes confounding effects of retention
  - 48% of population
- Of those with orders, 55% made at least one application on JASS

The identification of differences in the relative rate of applications in JASS across characteristics or across time may help to highlight factors that could be related to JASS access or to applications in general. To address these issues, we analyzed the relationship between various Sailor characteristics and the probability of ever making an application on JASS. Specifically, we identified Sailors on the Enlisted Master File (EMF) who were E4* and above, and who had 9 or 10 months to their Projected Rotation Date (PRD) at the end of March, June, or September 2003. The March rollers** are defined as the "before" AIP sample, the June rollers are the early AIP sample, and the September rollers are the "after" AIP sample. We further restrict our sample to those Sailors who were on full duty when they entered their PRD window (this excludes primarily those in training or on Limited Duty (LIMDU)).

We then followed these Sailors on the JASS application and orders files for 6 months (e.g., the March rollers were followed from March through August). We noted whether the Sailor received orders and, if so, whether he or she ever made an application on JASS within that 6-month period. By selecting only Sailors with orders, we minimized the confounding issue of retention (however, even Sailors who have orders may not stay, and those who do not have orders by the time they are 5 months to PRD may reenlist).

*We confine our sample to E4 and above because Sailors in paygrades E1 to E3 are not eligible for AIP jobs.

**For our purposes, we define rollers as Sailors who have entered their 6- to 9-month PRD window, a time when Sailors may apply for their next job. When a Sailor reaches the end of the PRD, he or she will be "rolling" to another billet, or separating from the Navy.

Certain Sailor characteristics are correlated so that it is not possible to disentangle the effect of individual characteristics on JASS use when we simply calculate the percentage of Sailors who ever apply on JASS. For instance, if Sailors in higher paygrades apply to JASS at a much lower rate than more junior Sailors, changes in the percentage of Sailors who ever apply on JASS could be due to a true change in application behavior, or to changes in the paygrade mix of Sailors in their PRD window.

To control for these confounding effects, we estimated a multivariate logistic regression of the probability of applying on JASS controlling for a number of Sailor characteristics. These include paygrade, gender, marital status, age, months to end of active duty obligated service (EAOS), race, children, AFQT, years of education, current seashore code, whether the Sailor is rolling to sea or shore duty, and rating (we included over 50 ratings, representing over 85 percent of Sailors in the sample). We also included variables indicating whether the Sailor entered his or her PRD window in late March, June, or September. Summary statistics for this sample are provided in appendix A.

Overall, 48.4 percent of Sailors in our sample had received orders by the end of 6 months. Of these, 55.1 percent applied on JASS at least one time.

## Real Differences Exist

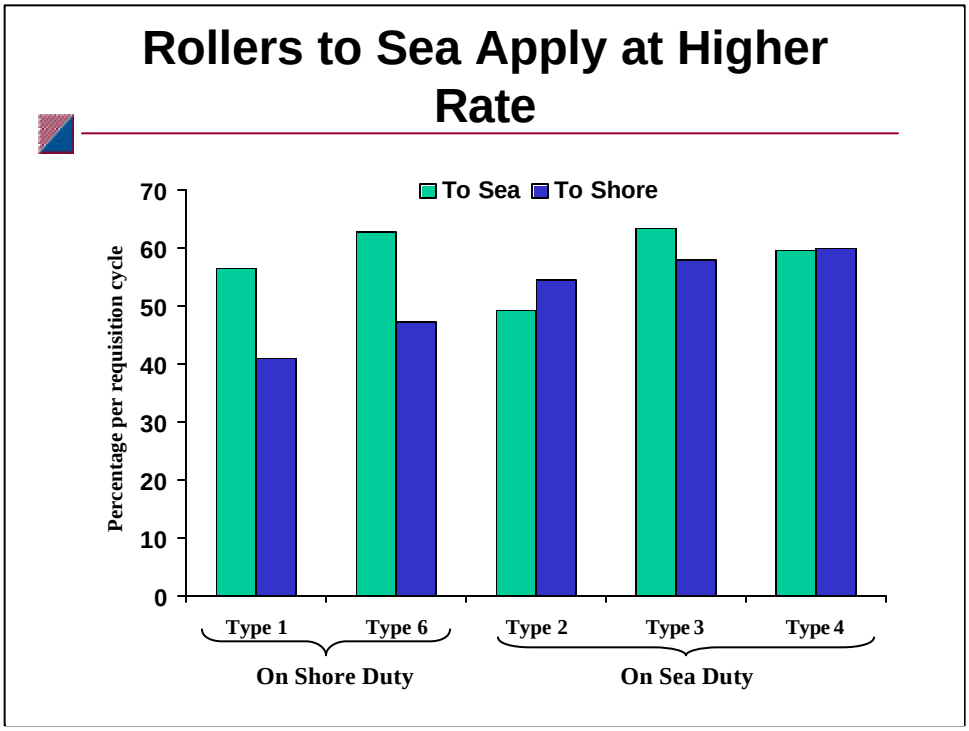
- JASS application rate has increased since AIP
  - 7% increase between June and September
- Access is not an issue for Sailors OCONUS and/or on sea duty
- When we control for relevant factors, greatest application rate is by:
  - Sailors rolling to sea duty
  - Junior Sailors
  - Minorities
  - Males
  - Single Sailors and those with nonmilitary spouses
  - Sailors with more obligated service
  - Older Sailors within the same paygrade
- Large differences by rating

Using the estimates of the effects of various characteristics on the probability of ever applying on JASS, we predicted differences in JASS application rates when we vary just one variable. This allows us to determine the impact of that variable in isolation. For instance, given the same rating, paygrade, gender, and so on, we predict the effect that seashore code of a Sailor's current and next assignment has on JASS applications.

Our results indicate that there has been a statistically significant* increase in applications on JASS since AIP was first implemented. We found no difference in overall application rates on JASS between March and June rollers. However, the predicted percentage of June rollers who applied on JASS was 53.5 percent, and for September rollers was 57.4 percent, representing a 7-percent increase in application rates. The implementation of AIP could cause an increase in JASS applications through two effects: either Sailors were previously unaware of JASS and the AIP information campaign increased their awareness, or they previously preferred to apply with a detailer directly, but wanted to apply to AIP jobs, which necessitated making JASS applications. As we noted previously, data limitations do not allow us to determine the underlying reason for the increase.

While we find no statistically significant differences in application rates based on AFQT, presence of children, and years of education, JASS application rates do vary by numerous Sailor characteristics. In the next few slides, we discuss differences by whether the Sailor was stationed OCONUS and/or on sea duty because this addresses our question of access. We refer the reader to appendix B for a discussion of results concerning differences in use by other characteristics noted in the bullets on this slide.

*Throughout the paper, we use a .05 threshold for statistical significance.




We identified Sailors by the sea/shore code (1, 2, 3, 4, or 6) they were on when they entered their PRD window and whether their follow-on orders were for sea or shore duty, resulting in 10 different categories of Sailors (e.g., currently on Type 1 duty with orders to shore, currently on Type 1 with orders to sea, and so on). If Sailors who are stationed overseas (Type 3, 4, and 6) have difficulty in accessing JASS, we would expect those Sailors to have a lower JASS application rate than those on CONUS duty when we control for other factors. We would expect to see similar differences if Sailors on sea duty experienced a reduced access to JASS. However, neither is the case.*

Our predicted probabilities of applying on JASS when we change only the current and follow-on sea shore duty type indicate that Sailors with the highest application rates are those in Type 3, 4, and 6—all overseas—when they enter their PRD window. We discussed these results with detailing experts, who suggested that the difficulty of Sailors stationed overseas is not in accessing JASS but in accessing a detailer on the phone, due to time zone differences. Following this line of reasoning, it would appear that Sailors, in general, prefer to apply for jobs directly with a detailer; when this is not possible, they will apply on JASS.

*The omitted category comprises those on Type 1 duty rolling to sea. The following are the only categories that are not statistically different from this category: those on Type 3 rolling to shore and those on Type 4 rolling to sea.

We also wanted to determine whether Sailors who are on sea duty have lower access to JASS than those on shore duty. The hypothesis is that Sailors who are deployed when they are in their PRD window have difficulty obtaining adequate bandwidth to access online JASS.

Our results led us to reject this hypothesis. Sailors on Type 4 duty (overseas sea duty) have an application rate that is as high as or higher than (a) Sailors on CONUS shore duty (Type 1) who are rolling to sea or to shore and (b) those on OCONUS shore duty who are rolling to shore.

Within the same current sea/shore code, significant differences in application rates exist according to whether the Sailor ultimately receives follow-on orders to sea or to shore (those rolling to sea having a higher application rate, in general, than those rolling to shore). Again, this does not appear to be an access issue. Instead, it may indicate an overall tendency for Sailors to prefer to talk with detailers over the phone to discuss shore duty and sea duty options. This finding indicates that the Sailors eligible for AIP—those rolling to shore—apply at a lower rate on JASS than do other Sailors. Even so, this could actually benefit AIP if detailers were instructed to encourage Sailors who call to consider AIP jobs. This may, in fact, be the case and could be a contributing factor to the increase in JASS applications since AIP began.

In summary, we have found that the rate of applications made on JASS varies by a number of Sailor characteristics. However, we conclude that most of the variance is due to differences in preferences to call a detailer directly rather than due to any real difference in JASS access.* Some of the preference to apply for jobs with a detailer directly may be a function of the number or types of jobs available within a rating, or to other complicated detailing concerns, such as family quality of life or berthing, that may not be as easily addressed when applying to jobs online with JASS. We address factors contributing to differentials in AIP application rates next.

*Some jobs, and disproportionately more in the Nuclear Field, require Sailors to apply for the job directly with the Bureau of Naval Personnel, using form 1306. Because of this, on average they may apply for shore jobs less frequently than Sailors in other ratings. However, it is our understanding that this represents a very small number of Sailors.

## What Is Related to AIP Job Applications and Fill Rate?

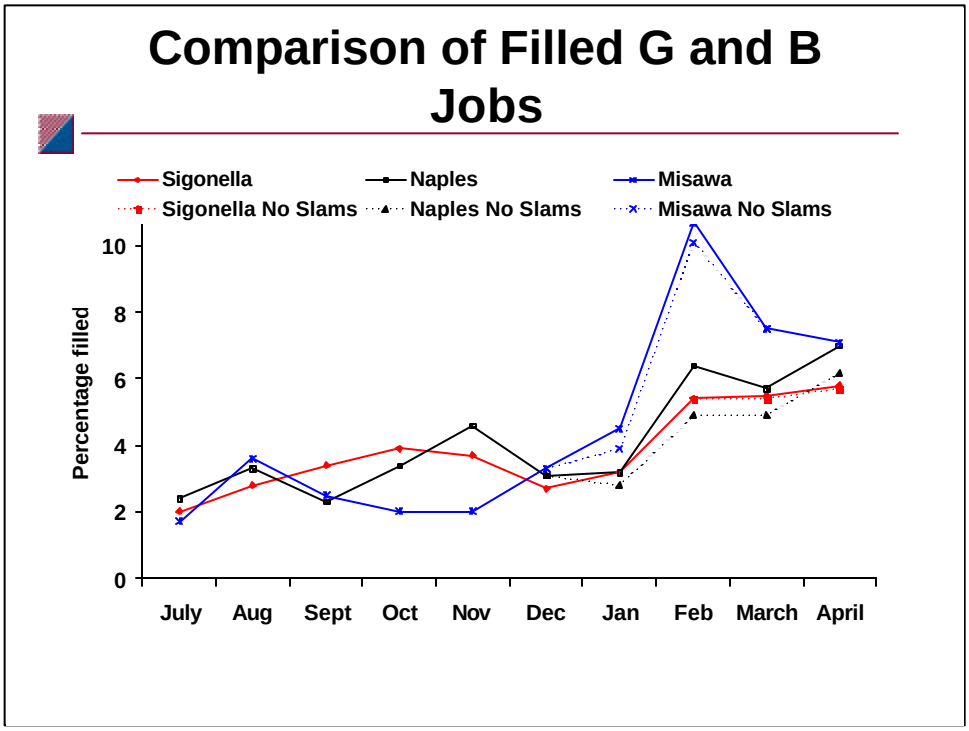
- From the perspective of the job, not the Sailor
- When we control for other factors, do applications and fill rate vary by paygrade, rating, and location?
- Does increasing the cap help?
- What else influences applications and fill rate?
- Comparison to other Type 6 is difficult

We are interested in a number of issues concerning the effectiveness of the AIP caps, as well as determining which job characteristics are related to low application and fill rates. Such differences may indicate the necessity of varying the cap by more than just location, paygrade, and a limited number of ratings, as they are currently based.

Analysis of the effectiveness of AIP is complicated by a number of issues. First, a comparison of the activity of AIP jobs to other Type 6 jobs is impossible because we cannot measure all applications to non-AIP jobs. We also do not have any information concerning the fill rates of non-AIP jobs since non-AIP jobs that are filled by Sailors who call their detailer are not noted on JASS. Further, while we have some detailed information concerning which AIP jobs were filled with Sailors who were slammed (more on this later), we have no information concerning slams to all other jobs.

A comparison of AIP jobs before and after the Navy offered AIP is impossible for many of the same reasons. In particular, we do not have information concerning applications or fill rates of AIP jobs before AIP because at that time Sailors could apply for these jobs directly with their detailer. These issues make it impractical to compare metrics across AIP and non-AIP jobs, or within AIP jobs before and after AIP. Instead, we conducted a multivariate analysis of the application and fill rates for AIP jobs exclusively. We then calculated similar analyses for other non-AIP Type 3 and Type 6 locations to determine whether differences exist in the relative fill rates of these locations in order to recommend future AIP candidates.

It is instructive, however, to examine overall fill rates for AIP locations since AIP began. We turn to that next.




In this slide, we show the percentage of G and B* jobs that have been filled, by month, for Misawa, Naples, and Sigonella between July 2003 and April 2004. We include both G and B jobs since the same type of Sailors can fill either G or B—Sailors within the normal 6- to 9-month PRD window. While Sailors only see G jobs on JASS, and therefore can only apply to those jobs, all B jobs are supposed to be similar to at least one G job in terms of rating, paygrade, UIC, NEC, and so on. Therefore, multiple applicants for G jobs may fill otherwise identical B jobs. Throughout our analysis, except where noted, we exclude F jobs (Red Zone) because these are jobs with a much shorter take-up month (TUM), and they are typically filled by Sailors outside the normal PRD window. Application behavior and fill rates would vary significantly for these types of jobs because of this.

Because we have detailed information concerning involuntarily assigned Sailors since January 2004, we differentiate voluntary and involuntary fills since January.

The fill rate for all three locations has increased since AIP began, even in voluntary fills. The increasing fill rate over time for the AIP jobs could be due to several factors, including increasing caps, improving acceptance and understanding of AIP on the part of rollers and detailers, and an increasing pool of eligible shore rollers. For reference, appendix C provides information pertaining to caps by location throughout this time period.

*G jobs are "Green Zone jobs," or open requisitions that Sailors see when viewing JASS. B jobs are "Unavailable – hold," which Sailors do not see on JASS. Jobs are not necessarily unique across requisition cycles since most jobs are posted over multiple cycles. For instance, a job that is posted over three consecutive requisition cycles would be considered as one job in each cycle, but would be considered as three jobs over the time period under study.

However, it is not possible to determine whether manning has improved over the same time period, given our data limitations. Further, without controlling for changes in AIP caps or types of rollers (in terms of rating and paygrade mix, for instance), we cannot fully understand why the fill rates have increased.

We turn now to a multivariate analysis of the various factors affecting which AIP jobs receive any bids, and ultimately are filled, so that we can disentangle these various effects.

## Our Analysis of AIP Applications and Fill Rate

- We cannot address manning issues
- Restrictions:
  - Misawa, Sigonella, and Naples only
  - Applications - G jobs; fill rate - G and B jobs
  - June 21, 2003 through March 9, 2004
- Findings:
  - Increases in AIP cap related to increase in applications and fills
  - Sigonella has low application rate and lowest fill rate
  - Differences exist in applications by paygrade, not in fills
  - Large difference in NCTAMS applications and fills
  - Large differences in rating, even when we control for paygrade, location, etc.

Perhaps the most important consideration in determining the success of AIP is in assessing whether manning in AIP locations is "adequate" since AIP began. The term adequate is an arbitrary one, but we use it because we do not assume that the Navy's goals or constraints necessarily dictate that manning be at or above pre-AIP levels in these same locations. In particular, Type 3 billets, because they are sea duty, have a higher priority than shore billets. Further, there may be some acceptable tradeoff between slightly lower manning and more voluntarily assigned Sailors.

For a number of reasons, it is not possible to address the issue of manning within the scope of this research. In particular, AIP was first implemented 10 months ago. Under normal rotation, Sailors would not apply for jobs until they entered their 9-month PRD window. Hence, relatively few Sailors will have rotated to their new AIP assignment to date. Further, manning is a complicated process that involves more information than is available. In particular, jobs must be of high enough priority to be posted on JASS (and therefore to be filled since AIP began), and we do not have information pertaining to whether these same jobs have experienced a lower priority since AIP was implemented. In other words, they may experience lower manning after AIP was implemented if, because they were converted from sea duty to shore duty, fewer jobs have been of a high enough priority to be posted on JASS. Even for jobs that are posted, they may have experienced a differential in priority in being filled (particular in terms of PCS funds) since AIP began. As more Sailors have been selected for JASS jobs and have reached their PRD, a more detailed analysis of manning may be possible.

Instead, we conduct multivariate analyses that are intended to provide some measure of the effect of certain job characteristics on application and fill rates in this early stage of the AIP experiment. Until more time has elapsed, until more Sailors rotate to these AIP assignments, and until more complete information can be obtained concerning such important factors as priorities and manning, a more comprehensive modeling is not possible. Even so, we believe these preliminary estimates provide useful information at this stage of the experiment.

Our analysis of AIP jobs includes two separate analyses. First, we estimate the probability that a G job receives any application (since Sailors can only apply directly to G jobs and not B jobs) per requisition cycle. We then estimate the probability that a G or a B job is filled per requisition cycle. We include both G and B jobs based on reasoning similar to why we include both in our summary statistics. We are interested in these two phenomena as separate events because different policy implications may be necessary to influence each. For instance, the probability that a job receives at least one application could be influenced by raising the cap. But that may only help to increase applications made by ineligible applicants (based on paygrade, NEC requirements, and so on). Different considerations come into play when filling jobs, such as PCS costs, take-up month, priority of the job, qualifications of the individual, and the total number of applicants for the job. For this latter factor, consider two scenarios as an example. Say there is one G job representing a total of one G and nine B identical jobs that must be filled. In the first case, there is exactly one qualified applicant who applies and is selected; in the second case, seven qualified applicants apply and are selected. In both cases, there was at least one applicant for the job. But in the first case, only 10 percent of the jobs were filled, compared to 70 percent in the second. In essence, the fill rate is a reflection of desirability of the job (because more applicants applied in the second case), as well as a function of PCS costs, eligibility, and so on. Ultimately, it is the fill rate that is of greatest concern in terms of readiness.

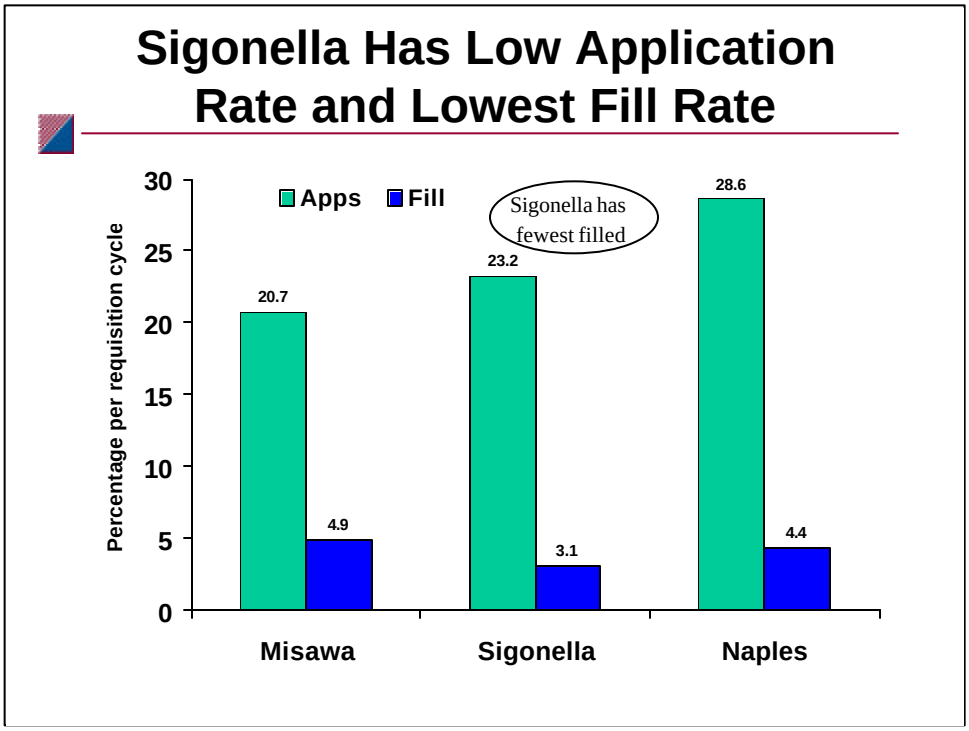
Our analysis includes Naples, Sigonella, and Misawa jobs, from the first AIP cycle in June 2003 through the first cycle of March 2004. We confine our analysis to these locations because these jobs have been available for the longest period of time under AIP. We include the following information pertaining to the job: paygrade, rating (we include 36 ratings, covering 93 percent of all Sailors in our sample), location, AIP cap, whether the job required an NEC, and whether the job was a NCTAMS job.* We also include two additional factors that we believe influence both application and fill rates. In particular, we hypothesize that the more Sailors that are available for shore jobs, the greater the application and fill rates, holding all else equal. And, given the same number of eligible rollers, more job options will reduce the number of jobs that receive any application. With the implementation of AIP, a large number of additional shore jobs have become available, potentially upsetting the balance between rollers and jobs that is necessary for optimal manning. This phenomenon may disproportionately affect certain ratings more than others, and will ultimately resolve itself as prescribed sea and shore tour lengths adjust to reflect the new mix of sea and shore jobs.

*These jobs have been the most difficult to fill, and have had the greatest number of Sailors involuntarily assigned to them since AIP began. Recognizing this difficulty, the Navy raised the cap in December for NCTAM IT jobs in Naples to $1,200, the highest AIP cap for any job to date.

But for now, it could have an impact on both applications and fill rates. Therefore, we include a measure of the total number of shore G jobs posted on JASS by paygrade and rating, and the number of Sailors within 6 to 10 months of their PRD who are currently on sea duty. (A certain proportion of these Sailors are not going to roll to shore, but this "error" will be fairly consistent across time and paygrade. Variations are most likely largest by rating, so the coefficient on the rating variables may capture some of this.)

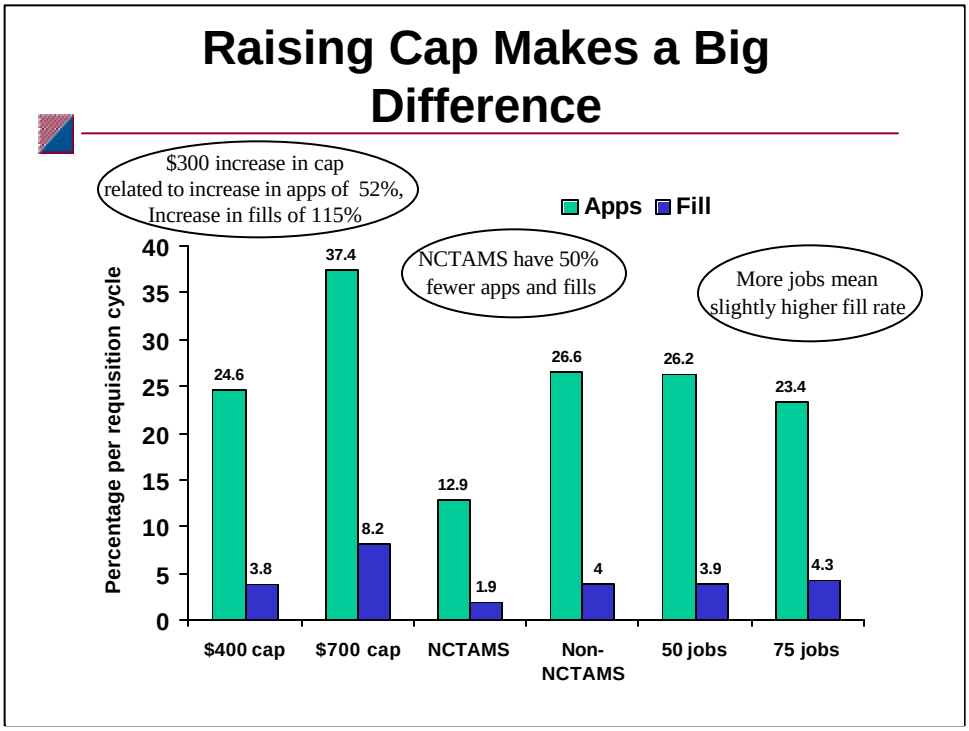
Because a large number of Sailors in closed-loop NECs (such as those in the Nuclear Field or special warfare), or who are HMs or DTs, can apply both within and outside their closed loop, complicating the measure of both rollers and available job options, we exclude these Sailors from our estimates. Finally, we have detailed information concerning which Sailors were involuntarily assigned beginning in January 2004, so we do not include these as applicants or as filled jobs. In other words, we are modeling voluntary behavior only. As we noted previously, only 9 Sailors were involuntarily assigned in the 7 months prior to that time, compared with 15 involuntarily assigned to these three locations in the 10-week period between the January 3, 2004 and March 9, 2004 requisition cycles, so we do not believe that this creates a significant bias.

Appendix D provides summary statistics for both the application and fill rate multivariate logistic regressions. We only include information for those ratings that are included in policy recommendations.




First, we present our predicted percentage of G jobs that received any applicant, and percentage of G and B jobs that were filled, each requisition cycle, based on location. These predicted percentages isolate the effect of the location alone, when we hold all other variables constant. In other words, given the same rating and paygrade mix, percentage of jobs that required an NEC or were NCTAMS, AIP cap, number of rollers and number of available jobs, we predict that Naples has the highest percentage of jobs that receive at least one applicant. The application rates for Sigonella and Misawa are statistically lower than Naples, but not statistically different from each other. In addition, we predict that the fill rate for jobs in Misawa and Naples are not statistically different, when we hold all else equal, including AIP cap, but the fill rate for Sigonella is statistically lower than for both Misawa and Naples. Thus, jobs in Naples experience both the highest application and fill rates. Conversely, jobs in Sigonella have the lowest application and fill rates, holding all else equal. Determining why Sigonella has the lowest activity is beyond the scope of this study, but we believe it warrants further study. For instance, it could be that we have not captured a category of jobs, similar to NCTAMS, that are undesirable but are disproportionately located in Sigonella.

While we find no statistically significant difference in the predicted fill rates for Misawa and Naples, the actual fill rates for these two locations are not equivalent in part because the paygrade and rating mix is not equivalent but, more importantly, because the AIP cap has been much lower for jobs in Misawa than for either Sigonella or Naples.

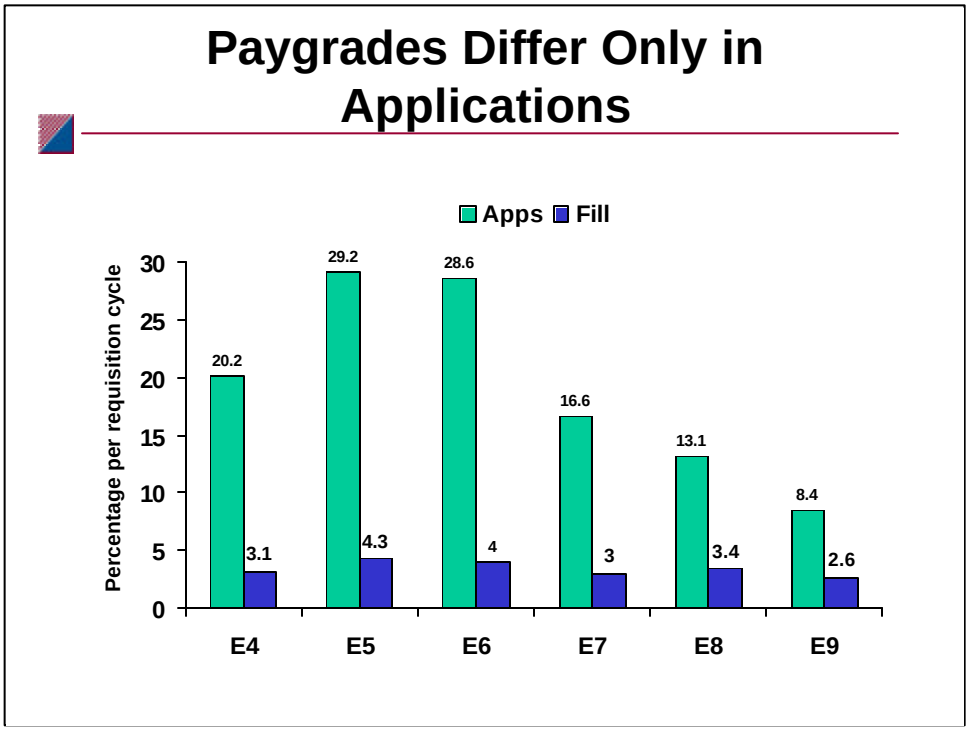



In this slide, we illustrate the relationship between increasing the AIP and applications and fill rates. We chose AIP caps of $400 and $700 because $400 is roughly equal to the average AIP cap in these three locations and represents the largest category of caps (45 percent of all AIP jobs had this cap) and $700 is roughly equivalent to one standard deviation above the average. In fact, only 4 percent of jobs had AIP caps higher than $700.

Our estimates indicate that a $300 increase in AIP cap is related to 52 percent more jobs receiving any application, and the number of G and B jobs filled more than doubles. This correlation is large and statistically significant. This suggests that the Navy could consider a cap increase when more applicants or a higher fill rate is required.

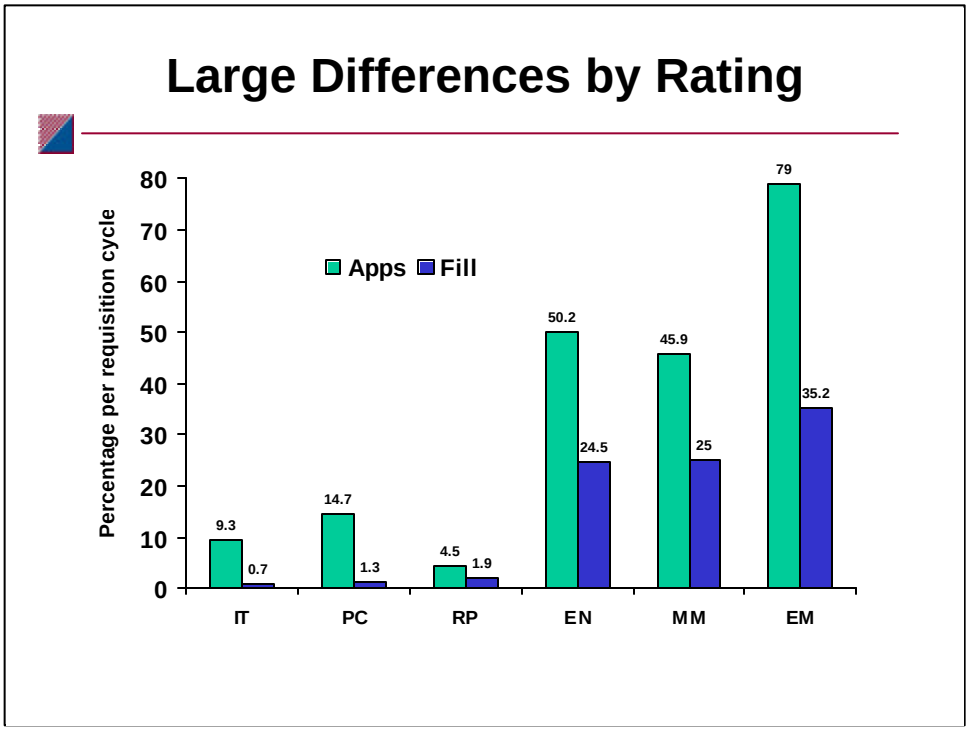
We also estimate that half as many NCTAMS jobs receive any applicant or are filled as non-NCTAMS jobs each requisition cycle, confirming the observation that it is more difficult to attract applicants to these jobs and to fill them. Therefore, we recommend that all NCTAMS jobs (which include ratings other than ITs) have a higher cap than other AIP jobs, as they currently do for ITs. However, the Navy should not raise the cap beyond a certain level that no longer makes AIP cost-effective, which we will address later.

We illustrate the effect that increasing the number of job options has on both applications and fill rates. The results illustrated here indicate that, when we hold all other factors constant, including the number of rollers, increasing the number of G jobs 50 percent (the average number of G jobs is 66) yields a slightly lower percentage of jobs receiving any applicant, but a slightly greater percentage being filled. These effects are statistically significant, but small.




Our results indicate that E5 and E6 jobs have the highest percentage with at least one applicant, but that the percentage of filled jobs is invariant with respect to paygrade (none of the coefficients on paygrade is statistically significant in terms of fill rates). We suspect this is due to two reasons. First, the higher percentage of junior paygrade jobs with applicants may be because, as we noted previously, junior Sailors are more likely than senior Sailors to make applications on JASS. However, more ineligible junior Sailors may apply to AIP jobs than senior Sailors, netting out this difference. It is not possible to identify all ineligible applications on JASS because of the inconsistent and cumbersome coding on the field pertaining to nonselection. While there is one field indicating the status of a Sailor's application (including whether he/she was selected for the job, eligible for the job but not selected, selected for another job, or ineligible), the category used for ineligible applicants is not used consistently. To see this, we look to the detailer remarks field, which is text only. A cursory look at this field shows that some Sailors are coded as ineligible because they are not within their PRD window and therefore do not meet the qualifications for the job, are not eligible for shore duty jobs, are not the right paygrade, do not have the requisite NEC, and so on. However, we also find that some Sailors are coded as ineligible due to lack of PCS funds. This reason is not consistently applied, however, since we also see that some Sailors who are coded as eligible but not selected also have a lack of PCS funds noted in the detailer remarks field. Hence, we cannot easily differentiate between applicants who are ineligible due to a true lack of qualifications and those who are ineligible due to a sometimes temporary lack of Navy PCS funds. We will return to the PCS issue shortly.

Holding AIP constant, however, we find that the fill rate is equivalent across paygrades. Thus, it may not be necessary to set the cap at different rates based on paygrade alone.




We illustrate here the most extreme differences in terms of fill rate, both high and low, based on rating, when we control for all other factors. The ITs have the lowest fill rate, while the EMs have the highest. We contrast the predicted fill rate with the predicted application rate to illustrate that there is a positive correlation between the two. In other words, ITs, PCs, and RPs have both below-average fill and application rates, while ENs, MMs, and EMs all have both above-average application and fill rates, when we control for other factors.

These differences are net differences in all other factors, including NCTAMS jobs. So, for the same AIP cap, in the same location, fewer IT jobs than EM jobs will have applications or be filled. We posit that these differences could be due to several factors:

- The variable measuring the number of rollers to shore does not represent the true population eligible within the rating, so that those with lower predicted application and fill rates may in fact have fewer eligible Sailors.
- Differences may exist between ratings in the number of Sailors currently OCONUS who are either not eligible for, or not interested in, back-to-back OCONUS tours.
- Differences may exist between ratings in the number of Sailors in locations that are cost prohibitive in terms of PCS funds to fill AIP jobs. This could also result in lower application rates if career counselors advise Sailors not to apply to AIP jobs because they believe that the Sailors will be denied based on PCS issues.

This is a fairly significant problem, and one that changes over time as funds become available. It also varies across ratings, as policies concerning PCS moves may not be universal across ratings. Since AIP began, we estimate that at least 7 percent of Sailors who were not selected were disqualified based on PCS shortfalls.* How does this affect AIP application and fill rates? If, for instance, a disproportionate number of shore rollers in certain ratings are OCONUS, and the PCS costs to send them to AIP locations is prohibitive, these ratings would experience lower application and fill rates due to PCS funds than other ratings. But a lack of PCS funds has another important implication. If Sailors who are disqualified based on PCS funds are bidding far below the bids of Sailors who are selected, the total cost to the Navy, in terms of PCS plus AIP, may be much greater for the winning Sailor than for the Sailor who was disqualified. Currently, there is no mechanism by which this sum total cost to the Navy can be weighed in making selections.

- Differences may exist in the type of jobs Sailors in certain ratings perform that we have not captured with the NEC or NCTAMS variables that make AIP jobs less desirable. For instance, there may be fewer career-enhancing jobs for PCs or RPs in Naples, Sigonella, and Misawa than in other shore duty locations. And, in fact, IT jobs in TS COMMS in Misawa, similar to the NCTAMS jobs, have required higher caps. Our analysis did not control for these jobs, which, similar to NCTAMS, includes ratings other than IT.
- Ratings may differ in the "variety" of jobs posted. In other words, if some ratings have a disproportionate number of G jobs that are identical in all respects, and these jobs are extreme in either spectrum of popularity, these ratings will have unusually high or low application rates. As an example, if the RP rating has numerous identical G jobs that are particularly unpopular (similar to NCTAMS), and less variety in other desirable jobs, we will find lower than average application rates for all G jobs for the RPs.
- Other incentives that vary by rating (such as LSRB) may influence bidding behavior.
- Differences may exist in preferences by the type of Sailors in various ratings.

Some of these issues will change frequently over time, such as PCS funds. Some will change more slowly, such as preferences for AIP jobs as Sailors become more familiar with the concept, or as changes occur in the number of eligible shore rollers. The latter is a slow change because the conversion of Type 3 billets to Type 6 has changed the total number of shore billets available, without a concurrent change in the number of shore rollers. Over time, particularly as sea and shore duty lengths adjust to reflect this change, a better balance will be created. And some factors may never experience any real significant change, such as the type of jobs available in these locations. Rapid and moderately paced changes mean that new estimates of the effect of various job characteristics, cap changes, and new locations will need to be made periodically. However, we emphasize that our results for AIP to date indicate that, regardless of the reason why differences exist in application and fill rates by rating, to ensure that there is an equitable proportion of Sailors filled involuntarily across ratings into AIP jobs, the Navy needs to offer higher caps for those ratings with the lowest (voluntary) fill rates. The predicted differences mean that, with current caps, the pool of interested/qualified Sailors is not sufficient in certain ratings, so the pool must be expanded with higher caps. We turn to a discussion of this in the next slide.

*This is based on reviewing detailers' comments. Since some detailers may not mention the reason for nonselection, this is an underestimate of the total percentage that were not chosen due to PCS funds.

## Proposal for Rating Caps

| | Low application | Not significant or average application | High application |
|---|---|---|---|
| Low fill | ABF, AW, EO, ET, IS, IT, PC | MS, YN | SK |
| High fill | | | AO, AZ, EM, EN, MM, PN |

Before we discuss our proposed basis for AIP caps, it is important to briefly discuss the role of AIP and what it can and cannot do. Increasing the cap on AIP jobs is beneficial in reducing the number of involuntary fills if there is the right mix between eligible rollers and total shore jobs. At one extreme, it requires one eligible, interested roller for each job, to ensure that no one is slammed and all jobs are filled. In that case, raising the AIP cap allows each Sailor to find a job that best matches his or her preferences, until there is an optimal match of jobs and Sailors, and no one is assigned involuntarily.

If, on the other hand, there are more jobs available than there are rollers, raising AIP caps only serves to create gaps in some other location, which in turn either necessitates slamming more Sailors into those locations, offering the AIP incentive in these locations, or allowing jobs in these locations to go unfilled. Gapped billets have readiness costs, and involuntarily assigning large numbers of Sailors has retention costs. However, adding AIP locations will never solve the problem of too few Sailors for too many jobs. But, in this case, the Navy must choose which locations and/or which ratings will experience the gapped billets.

We have categorized ratings based on our predicted applications and fill rates into those that are statistically high or low in fill rates, versus whether they are statistically low, not statistically significant, or statistically high in terms of application rates. Those in the blue box are significantly low in fill rates but are not higher than average in application rates, and we recommend that the Navy consider setting the cap for these ratings at higher levels than for all other ratings. We do not include the SKs because they have a high application rate,

which means that there is higher than average interest in the AIP jobs, but for unknown reasons they result in a lower fill rate. We also note that our previous recommendation was that the caps do not need to vary by paygrade.

Conversely, we do not believe that those ratings with high application and fill rates need to have lower caps. Higher caps do not preclude applications by Sailors who would like to have the job for an AIP incentive that is below the cap; a cap that is lower than the level required for anyone to take the job does. Put another way, if a job is attractive to a large number of eligible Sailors, each has an incentive to bid low to ensure his or her selection, regardless of the cap.* In this case, a cap that is "too high" does not increase the overall cost of AIP, nor does it lead to an increase in the number of Sailors who are involuntarily assigned. This is not the case with a cap that is too low.

*There is a body of literature pertaining to whether bids should be open or closed, whether caps distort bids, and so on. Such issues are beyond the scope of this analysis, but we recommend exploring them in subsequent research.

## Summary of AIP Cap Recommendations

- Caps do not need to vary by paygrade
- To achieve equivalent fill rates:
  - Equate the cap in Misawa to the cap in Naples
  - Increase the cap in Sigonella to be higher than Misawa and Naples
- Increase the cap for all NCTAMS jobs
- ABF, AW, EO, ET, IS, IT, PC, MS, YN should have higher caps than other ratings

Our analysis of the various factors affecting which jobs receive any applicants and are ultimately filled leads us to the following recommendations concerning AIP caps. First, we do not believe that caps need to vary by paygrade, overall. Junior Sailors apply at higher rates on JASS in general, which may be why fewer jobs in these paygrades do not receive any bids. However, fill rates do not vary by paygrade, even when we net out slams.

If the Navy's goal is to ensure that the fill rates for all three locations are comparable, then the overall cap in Misawa should be equated to the cap in Naples because each has fairly equivalent fill rates when we control for other factors. However, a higher cap in Sigonella (relative to Naples and Misawa) correlates to the same fill rate, so we recommend that the cap be higher in Sigonella for comparable jobs.

We also recommend that NCTAMS jobs have a significantly higher cap than non-NCTAMS jobs, in order to attract a sufficient number of qualified applicants (until it is no longer cost-effective to do so, as we noted previously). Since the predicted fill rate on NCTAMS (1.9 percent) is lower than the predicted fill rate for Sigonella jobs (3.1 percent), holding all else constant, we suggest that the premium for NCTAMS jobs be higher than the premium for jobs in Sigonella.

Within the same location, certain categories of ratings should have higher caps than others. In particular, we would recommend that non-NCTAMS jobs for ABF, AW, EO, ET, IS, IT, PC, MS, and YN have higher caps than other ratings.

Considering all recommendations together, the highest caps should be set for NCTAMS jobs in Naples (there are no NCTAMS jobs in Misawa or Sigonella). The next highest category of jobs would be for the ratings listed in the previous slide in Sigonella, and slightly lower and equivalent rates in the other two locations. Finally, all other ratings in Sigonella should have slightly higher caps than similar jobs in the other two locations.

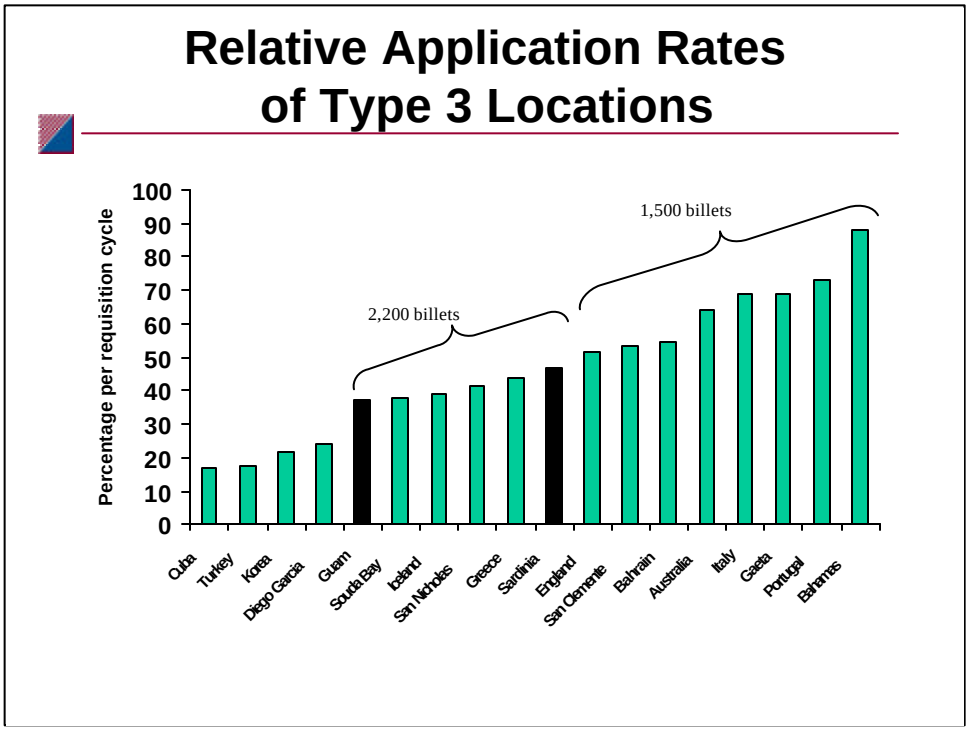
## Which Jobs Should be Next?

- CNO wants to minimize involuntary assignments
- Priorities could be based on manning, fill rates
  - Complicated function of priorities and other constraints
- CNA research indicated conversion of Type 3 was most cost-effective
- Other Type 6 make good comparisons to current AIP locations

The Chief of Naval Operations (CNO) has expressed his desire to increase Sailors' choice and job satisfaction while improving the efficiency of the distribution system, and reducing the number of involuntary assignments is a large part of that. We have found that increasing AIP caps is related to increases in the number of voluntarily filled billets, all else equal.

Our analysis of AIP has been confined to billets that were either originally Type 3 and were converted to Type 6, or were Type 6 all along. Since the experiment began, the Navy has added other billets that include those that are Type 2 and Type 4, but we did not include them in our analysis because they have been offered for such a short period of time. This raises the question of which locations and job types should be added as new AIP locations. Should it be based on current fill rates, priorities, or job type?

Previously cited CNA research that was conducted before the AIP experiment began concluded that AIP would almost certainly be cost-effective for overseas shore billets that use sea-duty credit as an incentive (Type 3), but it expressed reservations as to whether it would also prove to be cost-effective for other types of duty, particularly CONUS shore billets (Type 1) [2]. Fill rates are a complicated function of manning, priorities, and so on—factors for which we do not have information. Instead, because of the CNA research indicating that conversion of Type 3 billets would be the most cost-effective, we look at those job types for potential candidates. In addition, since Misawa was chosen as a hard-to-fill Type 6 location, we also consider those job types. Appendix D contains information pertaining to sample sizes and goodness of fit for the Type 3 and Type 6 logistic regressions.




To help determine which Type 3 duty locations might make good candidates for future AIP locations, we estimated the probability that current Type 3 duty locations received any application, per requisition cycle, as a function of the same variables that we estimated for the AIP locations. The exception was that, for obvious reasons, we did not include a variable for AIP cap, but we did include the month that the job was posted. We do this to control for changes over time that may influence application behavior. Our time period includes June 2003 through March 9, 2004, to be consistent with the AIP time frame. We include all Type 3 locations, but only differentiate the 18 locations with at least 75 jobs* posted since June.

Using our multivariate logistic regression estimates, we predicted the probability that a Type 3 job would receive at least one applicant based on location alone. Again, this controls for differences across geographic locations in terms of the rating and paygrade mix of available jobs. Our estimates then are purely the effect of the location on application behavior.

We also note that we cannot compare these predicted rates with those of current AIP locations because of the lack of consistency in measurement of applications for non-AIP locations, and because the population of Sailors applying for Type 3 billets (sea duty) is not comparable to the population that is eligible for AIP (mostly shore duty). Further, even the estimates within Type 3 locations may be somewhat biased if differences exist in the rate at which Sailors apply directly with detailers across these geographic locations. However, we have no reason to believe that this is so. Finally, since applications are purely voluntary, whereas fills may not be, we prefer to model applications only.

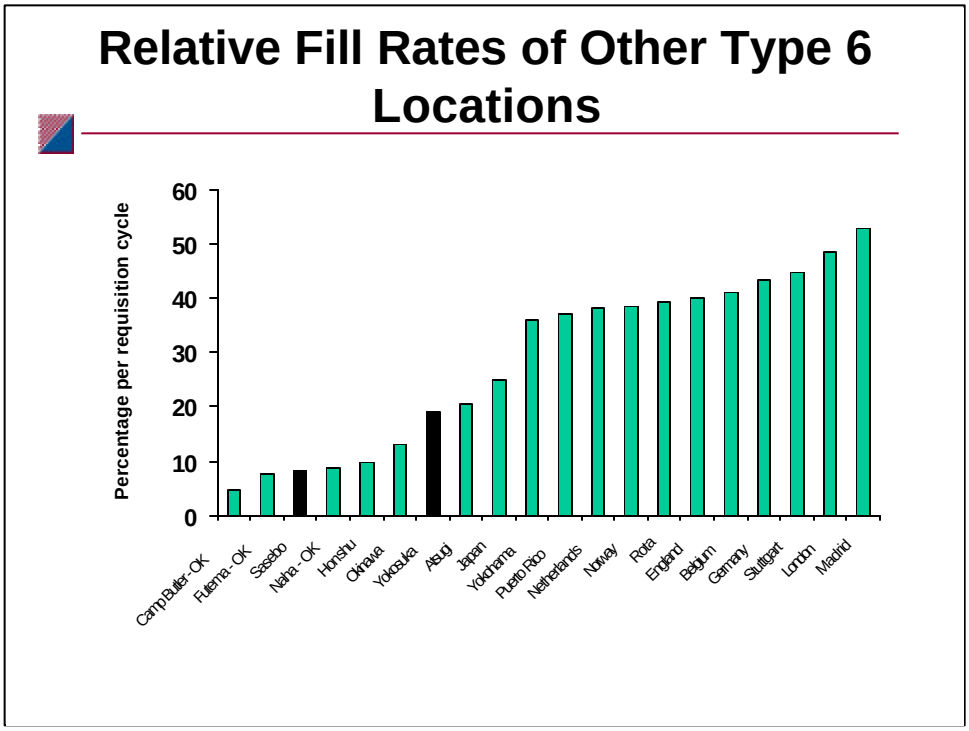
*Jobs are not necessarily unique and, in fact, many represent the same job posted over multiple cycles.

We note with black bars the fact that some billets in Guam and Sardinia have already been converted to AIP.

The savings in converting a Type 3 to a Type 6 billet in all locations would be fairly comparable; however, because of their relatively higher application rate, the cost of converting Type 3 billets to Type 6 in the locations with the highest percentage receiving any applicant would cost the Navy the least, in terms of AIP. Hence, we recommend that these locations be considered for the next round of AIP conversion. According to the June 2003 Enlisted Master File, there were 1,537 Sailors E4 and above (excluding ratings ineligible for AIP) who were stationed in the eight locations with the highest percentage receiving any applicant,* and 2,251 stationed in the next six. For comparison, there were 1,522 Sailors in Naples and 1,731 in Sigonella. By far, these two locations had the largest number of Type 3 billets before AIP began.

Once a location(s) is chosen, however, we recommend that the Navy conduct an analysis of application behavior for that location(s) to determine, similar to what we have done here, whether jobs vary in application rate by rating, paygrade, and so on. This would help to anticipate potentially difficult jobs to fill. Setting the caps higher on those jobs as they convert to AIP may help to minimize the need to slam Sailors into unfilled jobs.

*Bahrain is currently among the eight locations with the highest percentage receiving any applicant, but this may not be the case if Sailors stationed there no longer receive tax-free pay and benefits.




We conducted a similar analysis of Type 6 duty locations, under the same time frame, as we did for Type 3. And, as with Type 3, we include all Type 6 locations, but we differentiate the 20 locations with at least 50 G jobs. Again, we highlight with black bars the fact that some jobs in Sasebo and Yokosuka have already been converted to AIP.

Our recommendations for conversion to AIP for these billets is based on different reasoning than for Type 3. We chose Type 3 locations that we predict have a high probability of receiving any applicant, which in turn indicates that AIP bids would most likely be low for these locations. The benefit to the Navy was in the savings in converting Type 3 billets to Type 6.

For these Type 6 billets, there is no comparable savings in converting jobs to AIP, except in the costs associated with slamming Sailors into the least desirable locations (or allowing billets there to be gapped). So, in contrast to our recommendations for Type 3 locations, we recommend converting the Type 6 locations with the lowest application rate per requisition cycle to AIP.

It is noteworthy that the ten locations with the lowest application rates are all in Japan, and we believe that this warrants further study. In particular, do these locations have a lower probability of receiving any applicant due to quality-of-life issues, restrictions in who may be stationed there, cost of living, and so on? If so, it may be more cost-effective to address some of these issues rather than offering AIP.

Finally, we repeat the caveat that offering AIP to some of these Type 6 locations will only be beneficial if it does not mean slamming an equal number of Sailors into other Type 6 locations, or leaving other Type 6 locations with an increased number of gapped billets. We also recommend further analysis to determine what the right level of caps should be in any additional Type 6 locations.

## Goals of a Cap Adjustment Rule

- React to job priority and labor supply levels
- Prevent delays in voluntary job fills
- Simplify cap increase decision process
- Allow bidding to reveal true price of job
- Allow for adjustments downward

We turn now to a recommendation for making AIP cap adjustments. The September, November, and December AIP cap increases were from Navy mandates, issued in response to a lack or low number of applications. Clearly, a need exists to create a mechanism by which AIP caps are adjusted periodically. However, if the cap is set sufficiently high, and there is competition for the job, the cap is not binding (e.g., bids will be below the cap). Only if Sailors are somehow influenced to bid higher with higher caps than they would otherwise is it necessary to establish caps that are lower than those established by law (i.e., $1,500 per month), or necessitated by budgetary constraints. As we have noted, addressing that issue is beyond the scope of this project.

In this slide, we outline the five main goals of a cap adjustment rule. Primarily, an AIP cap increase ought to be in response to job priority and labor supply levels. In addition, a cap rule should become effective before involuntarily filling the job is necessary. However, a cap rule should not further complicate the system. For it to be useful, it must be simple to implement.

The goal of a cap adjustment rule is to increase AIP caps at the appropriate time, in order to increase application activity. If applications do not increase, the cap needs to be raised repeatedly, until it is determined it is at the right level. Conversely, adjustments may have to be made downward. Again, this is necessary if Sailors are somehow influenced in their bids by the stated cap. Otherwise, it is not.

The most basic metrics on which to base a cap adjustment rule are applications and fill rates. Since fill rates are also a function of involuntary fills and/or PCS funding issues, we prefer to use applications as our measure to net out these confounding factors.

However, AIP has been implemented almost one full year in three different locations, so the Navy now has far more information on which to base cap levels for new locations than it did when the experiment first began. Our analysis described here highlights some of this information, especially in terms of differences in locations, ratings, paygrade, and types of jobs. Therefore, we would argue that an automatic cap adjustment rule is not as necessary now as it may have been when AIP first began. As we noted previously, we strongly recommend that a more thorough analysis be conducted of proposed new AIP locations, similar to what we have conducted, to help inform decisions about caps from the beginning.

Even with careful analysis though, caps may need to be adjusted. This could be due to temporary phenomena, such as PCS shortfalls, or to changes in other incentives (such as LSRB, for instance), or to longer term changes, such as in reenlistments or quality-of-life in various locations. Further, not all phenomena can be known in advance. The difficulty in filling NCTAMS jobs is a case in point.

Therefore, we propose a metric that the Navy could use as one tool in a series of steps necessary to raise caps. The metric would be useful in identifying which jobs are not attracting enough Sailor interest to fill the current number of jobs. Once these jobs are identified, a further vetting process would be required that takes into consideration AIP funds, priorities of the jobs in question, manning, whether increasing AIP caps will help, and so on.

## Suggested Rule for Assessing Cap Adjustments

- Based on job type
  - Job type = jobs with the same community, paygrade, UIC, NEC1, and composite
- Based on length of time
  - If none of the advertised jobs of a job type receive an application in the last three cycles
- Flagged jobs are then sent on for decision
  - Ultimate decision would be based on priorities, funding, manning, and so on
- If a cap increase is approved, all jobs of that specific type receive the increase

In this slide, we present our metric for identifying which jobs may require a cap increase. Jobs are not uniquely defined across requisition cycles in the JASS data set and can't be tracked across requisition cycles. This is primarily due to the fact that openings are constantly occurring, and often multiple jobs with the same parameters are available each cycle. It is therefore not possible to determine which of the otherwise identical jobs is filled in the event that a Sailor is selected for one.

From the perspective of the Sailor (in terms of eligibility as well as desirability of the job), we propose that job types be defined as those that share the same rating or closed-loop NEC (e.g., those in special communities, such as the Nuclear Field, divers, HMs, and DTs), paygrade, UIC, NEC1, and composite (1 is shore jobs, 3 is non-submarine sea, and 4 is submarine sea). Jobs that share these characteristics are similar enough that applicants are likely to perceive them as the same job.

A job type that is posted for numerous requisition cycles without any voluntary applications indicates that that job type is not attractive enough and the AIP cap may need to be adjusted. The lack of applications could be the result of PCS shortfalls, insufficient rollers, and so on. Regardless of the reason, increasing the AIP cap could potentially increase the pool of interested applicants. For instance, a lack of applicants that is due to a shortage of PCS funds implies that no one for whom PCS costs would be low enough finds the job attractive. Therefore, raising the cap could attract those applicants for whom PCS funds are not an issue, thereby increasing application activity.

For how many cycles should this happen before the job type is flagged? Sailors within their normal PRD window (6 to 9 months) are considering G and B jobs, most of which have a similar type of time frame in which they must be filled. Because Sailors often apply in multiple cycles (for instance, because they did not get selected for the one or two jobs they applied to), we recommend that three cycles is an appropriate time frame. In particular, though, at least one job of the job type must have been posted as a G job in each of the three cycles to be flagged. This requirement controls for priority of the job type, to some extent, because only jobs that had a high enough priority to be posted as a G for three consecutive cycles would be included.

After a job type has been flagged as having difficulty in attracting applicants, we would recommend that the list be further vetted to consider such issues as AIP funds, PCS funds, manning, and priorities. Options include changing the cap, leaving the cap as is but slamming Sailors into the jobs, leaving the jobs unfilled, or waiting another few cycles to make a decision.

In the event that a job type is ultimately chosen for a cap increase, we would then recommend that all jobs (including G, B, and F) of that type should have a cap increase.

A similar methodology could be used to determine which job types, if any, require a downward cap adjustment.

## What Would Have Been Flagged With Our Metric?

| Rating | July 4 | | | Oct 4 | | | Dec 6 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Misawa | Naples | Sig | Misawa | Naples | Sig | Misawa | Naples | Sig |
| 1002 | | | | | 2 | | | 2 | |
| ABF | | | 9 | | | | | 3 | |
| ABH | | 1 | | | | | | 3 | 9 |
| AS | 1 | | | | | 1 | | | 10 |
| AW | 1 | | | 2 | | 4 | | | |
| CE | | | | | 3 | | | 1 | 1 |
| CM | | | | | | | | | 5 |
| EO | | | | | 3 | | | | 7 |
| ET | 1 | 1 | | 2 | 15 | 1 | | 16 | 4 |
| IS | | 3 | | | | | | 5 | |
| IT | 4 | 17 | 12 | 8 | 68 | 15 | | 24 | 5 |
| MU | | | | | 2 | | | 1 | |
| OS | 1 | 1 | | | | 2 | 1 | | |
| PC | | | 6 | | | | | | |
| SK | 4 | | | 2 | | 1 | | | |
| SW | | | 3 | | | | | | 4 |
| YN | 1 | 4 | | | 1 | 2 | 1 | 4 | |

In this slide, we illustrate which ratings and locations would have been flagged by our proposed metric. We identify jobs by rating and location combinations that were posted for three consecutive cycles without any applications (we note only those ratings in which there was more than one job represented by the job type, or there was no applicant activity in more than one of these requisition cycles under review). We choose "triplet" requisition cycles that begin with the first requisition cycle of the month since these are the cycles that experience the greatest overall activity. The dates refer to the date of the first of the three cycles, and these particular dates were chosen for the following reasons: the July 4$^{th}$ cycle was the first cycle after AIP began that started with the first of the month; October 4$^{th}$ was the first beginning-of-month cycle after the first cap increase occurred (September 20); and December 6$^{th}$ was the first beginning-of-month cycle after the second cap increase.

We are defining categories of jobs in a broader sense than we recommend in our metric; we are only looking at jobs by rating and location (e.g., Misawa, Naples, or Sigonella), and we disregard paygrade and UIC. As a preliminary metric, we think aggregation at this level is the most informative.

We use this example to illustrate how the metric could be used to flag jobs that may require a cap increase. For instance, we highlight in blue those ratings that our multivariate analysis has shown to require higher caps than others, all else equal. All of them would have been flagged in the first triplet after AIP began. Similarly, after the first increase for IT jobs in September, this metric would have shown that the increase was still not sufficient since the December triplet also had a large number of jobs without any applicant. After these IT jobs were flagged, it would have been useful to identify whether all IT jobs were having

difficulty, or only those in certain paygrades or UICs. Our analysis has shown that ITs in general require a higher cap, but NCTAM UICs require even higher caps. While we don't illustrate it here, using our metric at the UIC level would have identified the NCTAMS phenomenon early on.

This metric can also help to identify whether difficulty in attracting applicants is unique to the location, or to the rating. For instance, if the rating is flagged with this metric in more than one location, it would indicate that the difficulty may be more a function of the rating than the location. Such is the case with ET, IT, OS, and YN in the first triple, and with AW and SK in the October triple. Conversely, comparing jobs by rating across locations helps to identify whether the same rating experiences difficulty only in certain locations, and not across the board. The difficulty with this, however, is that not all ratings will have G jobs posted for three consecutive cycles in all AIP locations. For instance, no MU job has been posted in Misawa or Sigonella since AIP began. This is why it is important to have flagged jobs further vetted to identify priorities, manning issues, and so on, which cannot be revealed by this metric alone.

Reinforcing this recommendation, we note that across all of these time frames ET jobs in all locations have experienced difficulty in attracting applicants. Their cap was increased in Misawa in September and again in November, but their cap has never been increased in Naples, where the most jobs have gone without any applicants. Even so, while 16 ET jobs in Naples did not receive any applications in the triple beginning December 6th, only one ET has been slammed into any AIP job since January, and that was in Naples. We contrast that to the fact that 12 ITs were slammed into jobs in Naples since January (with a total of 24 jobs without applicants in the December triple), and 3 MU Sailors were slammed into jobs in Naples since January (all were in the first cycle in January), even though there was only 1 job (G, B, or F) available for MUs at that time.

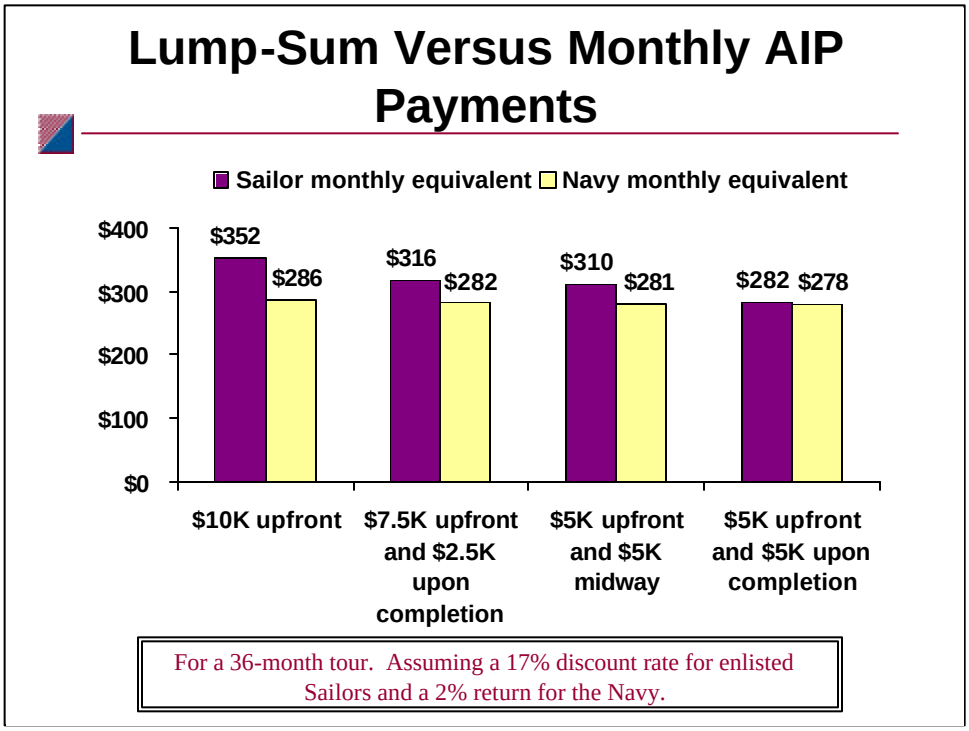
## Lump-Sum AIP Payment Method

- Suggested change to AIP system
- Requires mechanism to prevent reneging
  - End payment
  - Or severe penalty for leaving prior to assignment completion
- Potential to save Navy money in AIP payments

We turn now to a discussion of an alternative method of AIP payments. Currently, Sailors receive AIP monthly payments for the duration of their assignment; there has been discussion of replacing the current AIP payment method with a lump-sum payment method. Lump-sum payments may be more attractive to Sailors because they discount deferred payments at a fairly high rate. Examples of why a lump-sum payment may be preferred to a monthly payment include cash for a large consumer purchase, concerns over unexpected changes in future AIP payments, and cash to pay off debt.

For the Navy, lump-sum payments are attractive since they allow for greater control over the budget in the case of unexpected congressional budget cuts, and they may be more cost-effective than monthly payments. In the next slide, we present examples of how a lump-sum payment may be more cost-effective than monthly payments, ignoring the cost to the Navy of reneging.

However, the issue of reneging is an important one. In deciding whether to implement a lump-sum program, the Navy needs to consider the cost of recouping AIP money from Sailors who leave their assignment early and what mechanisms would be most effective in encouraging Sailors to complete their AIP tours. For example, a lump-sum payment scheme that includes a portion of AIP being paid at the end of the tour acts as an incentive for Sailors to complete their assignment.




If Sailors discount future streams of payments more than the Navy, it may be cost-effective for the Navy to implement a lump-sum payment method. How much Sailors value current payments relative to deferred payments is indicated by their discount rate. Research has found that military enlisted personnel have a personal discount rate that ranges between 15 and 20 percent. This rate is much higher than the government's official real discount rate for 3-year projects of 1.6 percent [3, 4].*

In this slide, we show the monthly equivalent to Sailors and the Navy for four potential lump-sum payment plans. We assume a discount rate of 17 percent for Sailors and 2 percent for the Navy. For the first set of stovepipes, we assume a 36-month tour and a $10,000 upfront payment. A Sailor with a 17-percent discount rate is indifferent between that lump-sum payment and 36 monthly payments of $352. From the Navy's perspective, the $10,000 upfront payment is equivalent to paying just $286 a month over the 36 months—far less than the $352 "value" the Sailor perceives from the upfront payment. This difference is a measure of the cost-effectiveness of the lump sum over the monthly payments. For each of the four lump-sum payment examples, an upfront lump-sum payment is more cost-effective to the Navy than a monthly payment plan, but less so as less of the lump-sum payment is paid up front. Thus, there may be little or no cost benefit to implementing a lump-sum payment scheme if the end payment required to prevent reneging is a significant portion of the overall payment.

*The forecasted 3-year real interest rate for Treasury notes and bonds for 2004 is 1.6 percent.

## Cost of Assignment Process Prior to AIP

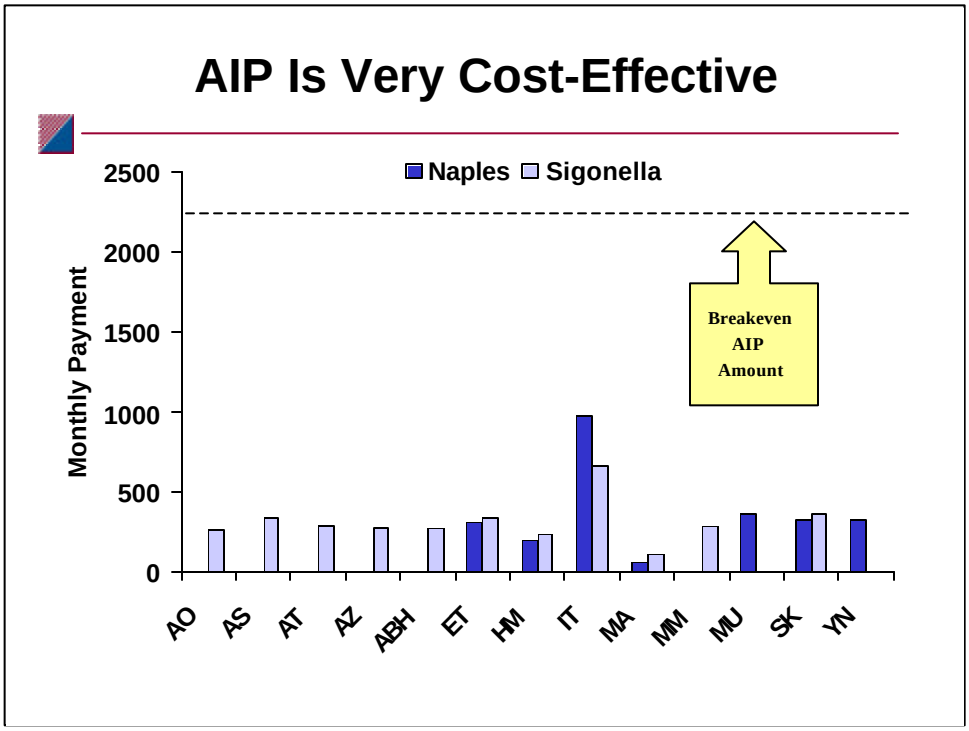
- Previous CNA research found:
  - Cost of sea duty credit incentive
    - Approach 1: Sea duty credit requires higher endstrength
      - $195 million annually
      - Approxmately $2,200 per month
    - Approach 2: Sea duty credit reduces Sailors' available for true sea duty
      - $83 million annually or $785 per month
- CNO's goal of cutting endstrength makes approach 1 the most relevant

We turn now to a discussion of the cost-effectiveness of AIP. Two rationales for implementing the AIP program were to increase volunteerism within the assignment system and to eliminate Type 3 duty. Previous CNA research estimated various costs associated with maintaining Type 3 duty, and with involuntarily assigning Sailors [1, 2].

The first approach assumed that, in order to maintain Type 3 billets, the Navy maintains a higher endstrength than is necessary, in terms of shore billets for rotational purposes to support these sea duty billets. They estimate that, to maintain the same sea/shore ratio, converting all of the 8,800 Type 3 billets to shore billets would allow a total of 14,250 shore billets to be outsourced. Using the composite rate for an E5, and an estimate of 30 percent savings from outsourcing, they estimate a cost of all Type 3 billets of $195 million annually. Using an updated composite rate for an E5 for FY03 ($55,858), and maintaining the same factor (1.6) of shore jobs that could be outsourced for each Type 3 billet that converted to Type 6, this translates to roughly $2,200 per month per Sailor.

The second approach is based on the assumption that, instead of maintaining higher endstrength, the Navy is able to fill these Type 3 billets by sacrificing fleet manning and readiness. In order to buy higher fleet manning to compensate, the Navy must use an incentive, such as sea duty pay, to encourage Sailors to remain on or extend sea duty. The cost of supplementing sea manning by 8,800 extra work-years would cost approximately $83 million annually, or $785 per month, in sea pay.

Given the CNO's goal of cutting endstrength, we believe that the costs associated with the first approach are the most relevant.




In this slide, we illustrate the average winning bids for a number of ratings in Naples and Sigonella through the first cycle of May 2004. We restrict our sample to include only those ratings for which there were at least 10 winning bids. We contrast these averages with the breakeven value of $2,200 per month described in the previous slide. The difference between the average AIP award for each rating and this $2,200 value is the net benefit to the Navy in converting the billet from a Type 3 to a Type 6. Thus, the benefits of AIP for these locations far exceed the costs, across all ratings. We will return to this point in the next slide.

This slide also illustrates a few additional points. First, it shows that ITs are outliers in terms of the overall AIP experience; their average winning AIP bid far exceeds those of other ratings. In fact, the average winning bid for ITs ($980 in Naples and $664 in Sigonella) is almost twice that of the average winning bid in the next highest rating in both locations. In contrast, the average winning bid for Sailors in the MA rating for Naples has been just $52, and $108 in Sigonella.

This graph also illustrates that, with the exception of ITs, Sailors in the same rating require a higher AIP incentive for Sigonella than for Naples.

What this does not illustrate, however, is that these averages include only “successes” and are not a true reflection of the AIP levels necessary to entice Sailors in certain ratings and locations to bid. In other words, we have observations only on how much it took to get at least one Sailor to successfully bid on these jobs, and not on what it would take to fill jobs that have gone unfilled (or were filled with slammed Sailors). The IT Sailors are a case in point.

## AIP Is More Cost-Effective Than Type 3 Duty

| Location | Number of jobs | Average monthly AIP | Annual cost of AIP | Estimated savings | Ratio of Benefits to Costs |
|---|---|---|---|---|---|
| Sigonella | 218 | $291 | 761K | 5,882K | 7.7 |
| Naples (non-NCTAMS) | 188 | $320 | 722K | 5,072K | 7.0 |
| Naples - NCTAMS | 26 | $811 | 253K | 701K | 2.8 |

In this slide, we estimate the costs and savings (using the $2,200 per month figure) accruing from AIP to date in Naples and Sigonella, using the average bids from voluntarily filled AIP jobs (through the March 9, 2004 requisition cycle). We differentiate NCTAMS jobs in Naples because their bids have been so much higher than for other billets. We will look at these jobs in more detail later.

For non-NCTAMS jobs, we calculate that savings in Sigonella and Naples are at least 7 times as great as the costs. And for NCTAMS jobs, the ratio of savings to costs is 2.8. For the Navy to realize these savings, however, they must ultimately outsource this number of shore billets.

Estimating the benefits for Misawa is more problematic since these jobs were Type 6 both before and after AIP began. The savings that accrue from offering AIP in these locales include, at the least, retention savings from increasing the rate of volunteerism for these jobs. An estimate of these savings is beyond the scope of this study. However, we note that the average winning bid for all ratings with voluntarily assigned Sailors in Misawa is at or below $150, with 4 exceptions, involving 15 Sailors. These ratings and the average awards are as follows: BU ($200), CE ($200), ET ($633), and IT ($1,120).

## Some Additional AIP Issues

- When is converting Type 3 cost-effective?
  - If shore billets in the rating are good candidates for outsourcing – average awards of $2,200/month or less
  - If not good candidates - if difference in incentives to achieve volunteerism under Type 6 versus Type 3 is less than $785
- What should be done to fill NCTAMS jobs?
  - Short term: Increase cap to $1,500
  - Long term: Increase cap up to $2,200
  - Address other reasons for lack of applications

We turn now to a more detailed discussion of some issues that have been raised concerning AIP. First, we have noted several times that because IT Sailors require a much higher AIP incentive to be attracted to certain jobs, particularly NCTAMS, it may be more cost-effective to revert those jobs, or any job in which the level of incentive that is necessary to ensure voluntary fills reaches a particular threshold, back to Type 3. But just what is that threshold?

In the last slide, we noted that, even for NCTAMS jobs, AIP is very cost-effective in terms of savings from outsourcing. But is this true for all billets? In other words, is it reasonable to assume that there are sufficient IT shore jobs that are good candidates for outsourcing? And if so, is the 30-percent savings from outsourcing appropriate in this case? Answers to these questions are beyond the scope of this project, and we believe that they warrant further study. However, this is an adequate approximation to the savings for the remainder of this discussion.

Conversely, if IT shore jobs are not good candidates for being outsourced, the main savings from converting Type 3 billets to Type 6 is in the savings from sea duty pay, which is invariant with respect to rating. In this case, according to the CNA study cited earlier, the estimated savings is $785.

Even when the average award necessary to ensure total voluntary assignments exceeds $785, it may still be cost-effective to keep the jobs as Type 6 if the Navy wants to minimize involuntary assignments. Unless these NCTAMS jobs were filled 100 percent with volunteers when they were Type 3, which is a heroic assumption at best (but we have no way of knowing), the problem of involuntary assignments has not been resolved if they are reverted to Type 3. The average AIP award necessary to ensure that an equivalent proportion of assignments to these jobs are filled voluntarily as Type 3 must be at least $785 less than the average required when they are Type 6 (the difference is the savings in sea duty pay as Type 6) for it to be cost-effective to revert these jobs to Type 3.

In any event, the current cap on NCTAMS IT jobs is not high enough to promote sufficient volunteerism. Given the Navy's interest in outsourcing shore billets, we submit that the Navy should incrementally increase the caps on any formerly Type 3 billet to ensure adequate volunteerism, up to $2,200. Since the congressional limit has been set at $1,500, this may take some time. If there is still insufficient interest at this level, a decision to revert the jobs back to Type 3 would require estimating the cost to ensure equivalent volunteerism as a Type 6 billet, as we discussed above.

AIP and duty type may not be the only incentives or factors affecting the relative desirability of these jobs. There may be other, more cost-effective strategies to increase volunteerism for these jobs if the lack of applications are due to factors that could be addressed by other means, such as shortening the workday, automating some activities, adjusting rules on overseas assignments, increasing manning overall, and so on. While these factors are beyond the scope of this study, we suggest that a more comprehensive understanding of the reasons for such low application rates for the most difficult-to-fill jobs is warranted.

## Summary

- AIP should continue
  - Savings are 2 to 7 times greater than costs of AIP in non-NCTAMS jobs in Naples and all jobs in Sigonella
  - Increase in the cap is correlated with an increase in both applications and fill rates
  - AIP caps should vary by location, rating groups, and type of job
- Increase caps for NCTAMS jobs to $1,500 in short term
  - Determine whether shore jobs in ratings assigned to NCTAMS are good candidates for outsourcing
  - If so, caps should be raised even higher in the long run

Our findings conclude that the AIP program should continue. We have found AIP to be cost-effective, especially for billets that were previously Type 3. We have also found that raising the AIP cap is related to an increase in applications and the fill rate of these traditionally hard-to-fill billets.

When we control for other factors, we find that larger incentives are necessary to fill NCTAMS jobs (regardless of rating), and for all jobs in certain ratings, but larger incentives are not necessary across paygrades. We also find that, all else equal, Sigonella requires higher caps than either Misawa or Naples.

NCTAMS jobs have been the most difficult to fill to date. It is clear that the cap is not high enough to ensure adequate volunteerism. In the short term, we recommend that the Navy increase the cap on NCTAMS jobs to the congressional limit of $1,500. However, the Navy needs to determine the breakeven point at which the cost of AIP to voluntarily assign Sailors to these jobs (and that includes all ratings, not just ITs) exceeds the benefits. If shore jobs in these ratings are good candidates for outsourcing, this breakeven point is on the magnitude of $2,200 per month, and Congress would need to increase the caps. If they are not good candidates, and the Navy still wants to ensure volunteerism to these jobs, it is only cost-effective to revert them back to
Type 3 if the average AIP award as a Type 3 is lower than the average award as Type 6 by more than $785 per month (the savings from sea duty incentives as Type 6) for the same level of voluntary assignments.

## Summary (Continued)

- General access to JASS is not an issue
- Converting Type 3 billets in locations with highest probability of receiving any applicant has potential for the greatest savings
- Type 6 duty locations in Japan have largest percentage without any application of all Type 6
- Metric for flagging job types is first step in cap adjustments
- Lump sum may be more cost-effective than monthly AIP payments

We also conclude that overall access to JASS is not an issue in terms of restricting application activity. However, we find that certain categories of Sailors appear to prefer to be detailed directly by the detailer rather than by applying on JASS. This can actually be beneficial to AIP if detailers, in their conversations with Sailors, urge them to consider AIP jobs.

Since Type 3 jobs are the most expensive to the Navy, in terms of reduced sea manning and other costs, we recommend that the Navy consider converting more Type 3 billets to AIP before any other billet conversions. In particular, converting those with the greatest percentage with at least one applicant will most likely result in the greatest net savings.

Our analysis shows that all ten of the current non-AIP Type 6 locations with the lowest application rate are in Japan. We therefore recommend that they be considered for AIP before other Type 6 locations.

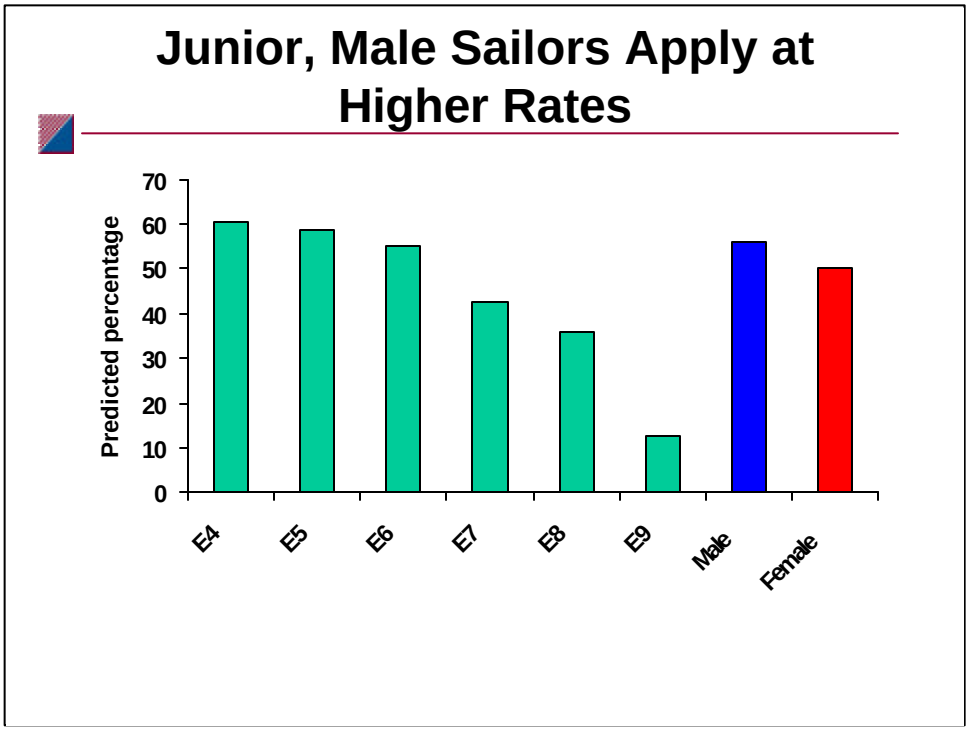
In order to adjust AIP caps in a timely manner, we recommend a cap adjustment metric and methodology to use in assessing which jobs (and locations), if any, may require a cap adjustment. After jobs have been flagged by this metric, they need to be assessed in terms of priority, available funds, manning, and so forth, to make a final judgment as to whether they should have the cap increased, whether Sailors should simply be slammed into the jobs, or whether to leave the job unfilled.

Our analysis has also shown that paying Sailors a lump sum for AIP up front may be more cost-effective to the Navy than comparable monthly payments. However, our analysis does not take into consideration the cost of Sailors leaving their AIP billet prematurely, or how the Navy could recover a prorated award in such an event.

# Appendix A: Summary Statistics for JASS Use Logit Regressions

| Variable | Statistic |
|---|---|
| **Mean:** | |
| Age | 30.5 |
| Years of education | 12.2 |
| Months to EAOS | 23.7 |
| AFQT | 58.4 |
| **Proportion of Sample:** | |
| Caucasian | .56 |
| African American | .23 |
| Hispanic | .10 |
| Male | .87 |
| E4 | .20 |
| E5 | .37 |
| E6 | .28 |
| E7 | .12 |
| E8 | .03 |
| Seashore 1 to shore | .04 |
| Seashore 2 to sea | .07 |
| Seashore 2 to shore | .37 |
| Seashore 3 to sea | .03 |
| Seashore 3 to shore | .04 |
| Seashore 4 to sea | .03 |
| Seashore 4 to shore | .04 |
| Seashore 6 to sea | .03 |
| Seashore 6 to shore | .01 |
| March | .32 |
| June | .31 |
| Single | .38 |
| Military spouse | .06 |
| Any children | .54 |
| **Sample size** | 18,205 |
| **Pseudo R-squared** | .0835 |

# Appendix B: JASS Use



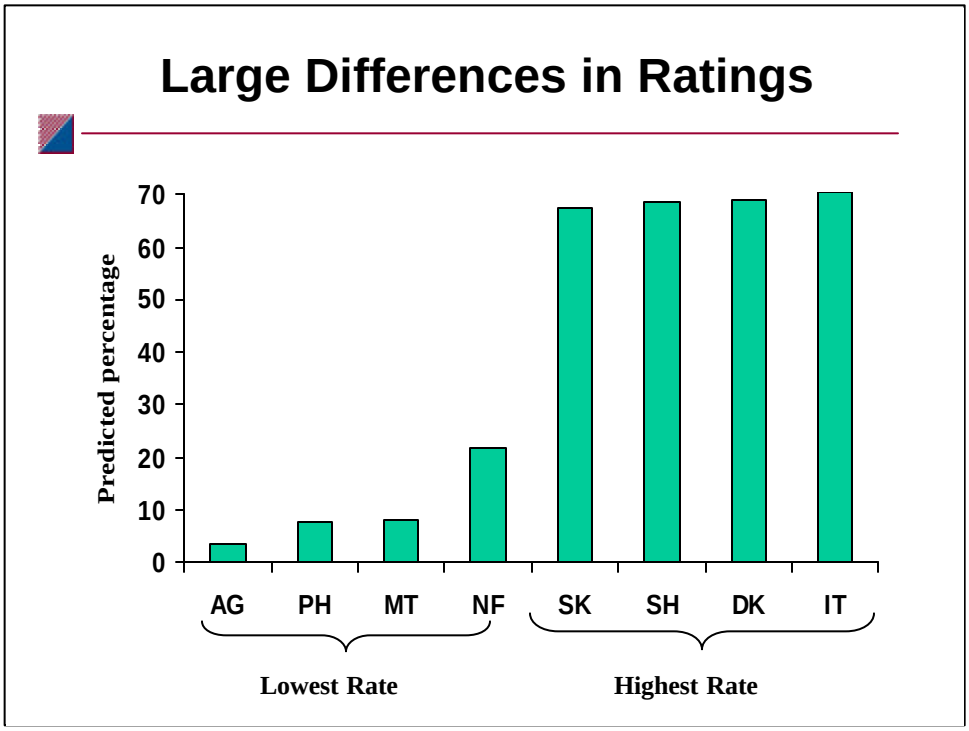

When we control for other factors, we conclude that Chief Petty Officers apply on JASS far less frequently than do junior Sailors. We emphasize that these results control for retention and for time remaining in obligated service. The difference in application rates between E4 and E5 is not statistically significant, which means that E4 and E5 Sailors apply at an equivalent rate on JASS. However, the difference between each consecutively higher paygrade is statistically significant. In other words, E6 Sailors apply at a lower rate than either E4 or E5 Sailors, E7s apply at a lower rate than E6s, and so on. This decreasing rate of use with increasing paygrade may be a reflection of a reduction in options for Sailors in higher paygrades, particularly in terms of career-enhancing moves. In other words, senior Sailors may feel that they have a better chance of obtaining their first choice job if they speak with a detailer in person. However, this phenomenon may also be due to the fact that senior Sailors are more accustomed to being detailed directly through a detailer and prefer detailing in the same way that it has been done for most of their career.

We also find that female Sailors apply on JASS less often than do males. The 8-percentage-point differences translates into an 11-percent higher percentage of male Sailors than female Sailors who apply on JASS. Again, it is not possible to determine whether, for instance, these differences are due to gender-specific preferences to be detailed by a detailer directly, or due to the need for discussions with the detailer about availability of jobs for female Sailors—perhaps because of berthing constraints.

While we do not illustrate it, we found that 17 percent more non-African-American or Hispanic minority Sailors apply on JASS than Caucasians, and this difference is statistically significant. Likewise, almost 5 percent more African-American Sailors ever apply on JASS than Caucasians. We find no statistical difference between application rates of Caucasians and Hispanics. Again, these results are net any differences in paygrade, rating, marital status, and so on. It is not clear why a difference exists by race and ethnicity, other than one that is based purely on preferences.

We have found that there is no difference in application rates between single Sailors and those with a nonmilitary spouse, but it is not surprising that those with a military spouse apply on JASS far less frequently. This is because co-location of military spouses requires special detailing that cannot be easily accommodated with JASS.

Small but statistically significant differences exist in application rates based on the age of the Sailor (even when we control for paygrade, presence of children, marital status, and so on) and time left in obligated service. In particular, older Sailors, holding all else constant, apply on JASS at a slightly higher rate, as well as Sailors with a longer time remaining on obligated service.




While we included over 50 different ratings in our analysis, we report the 4 ratings of the extremes, in terms of high and low predicted application rates, when we control for paygrade, sea/shore code, and so on. Less than 8 percent of Sailors in the AG, PH, or MT ratings ever apply on JASS, and approximately 22 percent of those in the Nuclear Field do so. Conversely, over two-thirds of Sailors in the SK, SH, DK, and IT ratings ever apply on JASS. More in-depth analysis is beyond the scope of this work, but we surmise that some of these differences are attributable to differences in the overall size of the rating or community and the number of options available (which could also be related to the size of the community). However, we note that there is no clear correlation between the number of Sailors in the rating and the predicted application rate. For instance, there are about 45 percent more Sailors in the NF than in the DK rating, yet DK Sailors apply at a much higher rate. Conversely, Sailors in the HT rating, for instance, with about the same number of Sailors as the SH rating in our sample, have a lower than average predicted rate of use. Clearly, the size of the community is not the only factor determining application rates.

# Appendix C: Summary of AIP Caps by Location and Paygrade

| Location | Activity | Rating | Paygrade | Cap | Start date |
|---|---|---|---|---|---|
| Naples | All | All | E4-6 | $400 | 21 June 2003 |
| | | All | E7-E9 | $450 | 21 June 2003 |
| | | IT | E4-6 | $600 | 20 Sept 2003 |
| | | IT | E7-9 | $650 | 21 Sept 2003 |
| | | IT | E4-6 | $700 | 24 Nov 2003 |
| | | IT | E7-9 | $900 | 24 Nov 2003 |
| | NCTAMS | IT | E4-6 | $1,200 | 23 Dec 2003 |
| | COMSUBGRU 8 | IT | E4-6 | $1,200 | 23 Dec 2003 |
| | STRIKFORSOUTH | IT | E4-6 | $1,200 | 10 Feb 2004 |
| | HQ NATO AFSOUTH | IT | E4-6 | $1,200 | 10 Feb 2004 |
| | All | HM/DT/MA | E4-6 | $200 | 10 Feb 2004 |
| | | HM/DT/MA | E7-9 | $250 | 10 Feb 2004 |
| Sigonella | All | All | E4-6 | $400 | 21 June 2004 |
| | | All | E7-9 | $450 | 21 June 2003 |
| | | IT | E4-6 | $600 | 20 Sept 2003 |
| | | IT | E7-9 | $650 | 20 Sept 2003 |
| | | IT | E4-6 | $700 | 24 Nov 2003 |
| | | IT | E7-9 | $900 | 24 Nov 2003 |
| | All | HM/ DT/ MA | E4-6 | $200 | 10 Feb 2004 |
| | | HM/ DT/ MA | E7-9 | $250 | 10 Feb 2004 |

| Location | Activity | Rating | Paygrade | Cap | Start date |
|---|---|---|---|---|---|
| Misawa | All | All | E4-6 | $150 | 21 June 2003 |
| | | All | E7-9 | $200 | 21 June 2003 |
| | | IT | E4-6 | $350 | 20 Sept 2003 |
| | | IT | E7-9 | $400 | 20 Sept 2003 |
| | | ET | E4-6 | $250 | 20 Sept 2003 |
| | | ET | E7-9 | $300 | 20 Sept 2003 |
| | | IT | E4-6 | $550 | 24 Nov 2003 |
| | | IT | E7-9 | $850 | 24 Nov 2003 |
| | | ET | E4-6 | $550 | 24 Nov 2003 |
| | | ET | E7-9 | $850 | 24 Nov 2003 |
| | TS COMMS Det | IT | E4-6 | $1,200 | 23 Dec 2003 |
| | CPW 1 | IT | E4-6 | $1,200 | 10 Feb 2004 |
| | All | HM/ DT/ MA | E4-6 | $50 | 10 Feb 2004 |
| | | HM/ DT/ MA | E7-9 | $100 | 10 Feb 2004 |

## Appendix D: Summary Statistics for Application and Fill Rate Logit Regressions

| Variable | Statistic | |
|---|---|---|
| | Applications Sample | Fill Sample |
| **Mean:** | | |
| AIP Cap | 455 | 441 |
| Number of rollers | 192 | 161 |
| Number of jobs | 67 | 49 |
| **Proportion of Sample:** | | |
| E4 | .29 | .28 |
| E5 | .44 | .43 |
| E6 | .18 | .18 |
| E7 | .08 | .09 |
| E8 | .02 | .02 |
| NCTAMS | .14 | .12 |
| NEC | .53 | .45 |
| Sigonella | .43 | .46 |
| Naples | .44 | .42 |
| IT | .25 | .21 |
| ABF | .03 | .03 |
| AW | .01 | .01 |
| EO | .02 | .01 |
| ET | .10 | .07 |
| IS | .02 | .02 |
| PC | .01 | .02 |
| MS | .03 | .04 |
| YN | .06 | .05 |
| SK | .09 | .11 |
| AO | .02 | .02 |
| AZ | .01 | .02 |
| EM | .00 | .00 |

| Variable | Statistic | |
|---|---|---|
| | Applications Sample | Fill Sample |
| **Proportion of Sample:** | | |
| EN | .01 | .01 |
| MM | .02 | .01 |
| PN | .01 | .01 |
| **Sample size** | 5,449 | 11,957 |
| **Pseudo R-squared** | .1308 | .0634 |

## Appendix E: Sample Sizes and Pseudo R-squared for Other Type 3 and Type 6 Logit Regressions

| Variable | Other Type 3 | Other Type 6 |
|---|---|---|
| Sample size | 5,748 | 9,144 |
| Pseudo R-squared | .1514 | .1387 |

# References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