

Incomplete Tours: Causes, Trends, and Differences

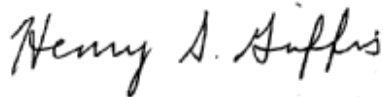
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A handwritten signature in black ink that reads "Henry S. Griffis". The signature is written in a cursive style with a large initial 'H'.

Henry S. Griffis, Director
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Executive summary

N13 sponsored this study to help determine the extent to which enlisted tours are completed and extended, the sources of incomplete tours, and what policy options might effectively increase completions. A 2002 CNA study found that, averaging over time and tour length, 67 percent of first-term and 51 percent of career tours were not completed [1]. These statistics raised alarm. We were asked to update the study and improve understanding of tour completion. Depending on the type of analysis, we can add 4 to 8 years of data.

Completion rates

The first problem we address is how reasons for leaving tours influence completion rates. A high percentage of Sailors do not complete their tours because they leave the Navy. Tours that are not Navy losses end because Sailors roll to shore duty early.

Distinguishing why tour obligations are not met is important because when most people think about completion rates they are thinking about Sailors' willingness to complete sea tours. This focuses on people who roll early and policies designed to induce Sailors to remain at sea rather than seek shore tours. Tours that end because of Navy losses, however, are primarily retention problems. Different issues and policies are relevant for Navy losses and early rolls.

Most of the analysis in this paper removes Navy losses and considers only tours that end with a move to shore duty. This adjustment makes the biggest difference for first-term tours; the percentage of incomplete tours drops from 61 to 21 percent for 48-month tours and from 79 to 45 percent for 60-month tours.

There are also differences in completion rates across terms and Prescribed Sea Tours (PSTs). In every case we examine, longer PSTs have more incomplete tours. Only 21 percent of first-term 48-month tours are incomplete compared with 45 percent of 60-month tours.

The 2002 study found that career tours are more likely to be completed. Actually, this is because of a different PST mix rather than higher completion rates within a given PST. Comparing 48-month tours, career Sailors have 33 percent incomplete tours compared with 21 percent for first-termers. The reason overall completion rates are higher is that more career Sailors have shorter PSTs where more tours are completed.

We analyze two groups of fiscal years: 1994 to 1999 and 2000 to 2006. We chose these groups because the number of tours per year and patterns of losses and completions become more stable in the later years. There are several differences between the two time periods. First, for all PSTs and terms, the fraction of tours that end in rolls to shore increases. Then, looking only at the early rolls, the percentage of incomplete tours decreases for 48-month tours and increases for 60-month tours. In addition, timing changes so that first-term Sailors on 48-month tours leave later and those on 60-month tours leave earlier. Taken together, this means that the gap in average months served is larger in the later period.

Reasons for leaving tours

First-term Sailors are much more likely to end tours because they leave the Navy. Only about 30 percent of first-term tours ended with a return to shore duty. More than half of career Sailors, however, left their tours with a return to shore duty. Although we focus on Sailors who roll to shore, tours that are incomplete due to a Navy loss should not be ignored. If these Sailors remained, they would provide more sea duty by experienced personnel. We will explore different policy options for Navy losses and for early rolls.

Timing of losses

The timing of losses refers to the percentage of tours still going on at a point in time. We look at tours that are ongoing at three-quarters through because, in most cases, there is little difference in losses at earlier points. For 48- and 60-month first-term tours, the differences in timing are pronounced. At the three-quarter point, 92 percent of 48-month tours were ongoing compared with 72 percent of 60-month tours.*

Average time served per tour

Average actual months per tour gives a measure not just of completing tours but also of when Sailors leave incomplete tours and how many months are contributed by personnel who stay in their tours beyond the completion point.

For first-term, 48-month tours, the 49.5 average months per tour exceeds the PST.* This reflects the high number of tours completed and the high number of months contributed by Sailors who serve at least 7 months beyond their Projected Rotation Date (PRD). For first-term, 60-month tours, however, months served is 51.4—86 percent of the prescribed tour length. Because there are more extensions of 48-month tours and fewer completions of 60-month tours, the difference in actual sea duty is only 2 months compared with a 12-month difference in obligated sea duty.

All other tour types, terms, and PSTs come close to fulfilling their obligations, with actual months served ranging from 93 to 99 percent of the PST.

Sea-intensive and shore tour comparisons

For comparison, we constructed data sets for sea-intensive ratings and shore tours. Our analysis does not support the hypothesis that there might be more difficulty with completion rates or time served for sea-intensive tours. In our analysis, we compare entire Navy averages to averages for a small group of sea-intensive ratings. Averages can always conceal differences between individuals, and we are not able to compare individual ratings because of data limitations. We do, however, show that Sailors in the small subgroup of ratings behaved virtually the same as those in all ratings, and it would be highly unlikely that one or two ratings in the group could drive this result.

*These calculations are based on data from the recent period, FY 2000 to FY 2006.

It is difficult to compare sea and shore tours because most sea tours are longer. Given what we can compare, shore tours have higher completion rates. Also, a high percentage of shore tours end in Navy losses. Eighty-nine percent of career Sailors on 36-month shore tours complete, but relatively few of them extend their shore tour or go to a sea tour. This suggests that Sailors may take these tours expecting to serve out their Navy careers.

Policy effects

Given the small difference in average sea time per tour between 48- and 60-month tours, it seems that lengthening PSTs may not be an effective way of increasing years of sea duty.

Even incentives for more Sailors to complete long sea tours are not cost-effective. This policy does not work well because it focuses on increasing completion rates rather than generating sea duty. In addition, it is targeted to Sailors on longer tours who are less responsive to extra compensation.

The most cost-effective way of increasing sea duty is a mix of sea pays and Selective Reenlistment Bonuses (SRBs). Sea pays can be structured to retain more Sailors on sea duty tours and/or to lengthen tours of Sailors who are not leaving the Navy. In addition, SRBs can be targeted at the reenlistment point to specific ratings/Navy Enlisted Classifications (NECs). In the current environment with many incomplete tours due to Navy losses and a subset of ratings needing extra sea time, SRBs may be particularly valuable.

Sea Duty Incentive Pay (SDIP) is a promising new option that pays Sailors to extend their sea tours or to cut shore tours short and go to sea. It can be targeted by skill and paygrade to Sailors who can best provide extra sea duty. The pay was started in March 2007, however, so its effectiveness has yet to be evaluated.

Recommendations

We offer the following recommendations:

- Know why tours are not being completed. Policies should be set based on whether incomplete tours are caused by leaving the Navy or rolling early.
- Use appropriate combinations of sea pays and SRBs as incentives to increase sea time voluntarily.
- Avoid prescribing longer sea tours to increase years of sea duty; this does not seem to be effective.
- Continue to pursue SDIP so that this promising pay can be tested and evaluated.

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Outline



- **Introduction and summary**
- Data and analytical approach
- Results for all sea tours
 - Raw completion rates
 - Loss types
 - Adjusted completion rates
 - Timing of losses
 - Average months of sea duty per tour
- Comparison with sea-intensive tours
- Comparison with shore tours
- Effect of policy changes
- Conclusions and recommendations

Introduction



- Part of N13's Personnel and Compensation Policy Analysis study
 - Determine the extent to which enlisted tours of duty are completed and extended
 - Address the concern that completion rates are strikingly low
- Followup to 2002 CNA paper
 - The previous paper's main concern was with how responsive completion and extension rates are to compensation
 - We do not revise this statistical analysis
- What we do in this paper
 - Update data from FY98 to FY06, adding 8 years
 - Look deeper into what causes incomplete tours and variations over time and type of tour
 - Compare all sea tours with sea-intensive and shore tours
 - Make specific policy recommendations

N13 sponsored this study because the Navy devotes considerable resources to personnel policies that facilitate the retention and distribution of its enlisted Sailors. Some of these policies are monetary incentives, and others are non-pay-related quality-of-service policies. Given the magnitude of the resources expended, the Navy must examine whether it is using policies in a way that produces the desired effect in the most cost-effective manner.

In this paper, we will examine the issue of tour completion and which specific Navy personnel and compensation policies may affect the number of tours that are completed. We will also examine alternative policies that increase sea duty without addressing the specific issue of completing tours.

A 2002 CNA study found that, averaging over time and tour length, 67 percent of first-term and 51 percent of career tours were not completed [1]. Given the high levels of incomplete tours and the fear that things may have gotten worse, we were asked to update the study and improve understanding of tour completion.

Findings of 2002 CNA study



- Overall, 67% of tours were incomplete, and the percentage increased with tour length
 - 29% for 36-month Prescribed Sea Tours (PSTs)
 - 64% for 48-month PSTs
 - 73% for 60-month PSTs
- Most incomplete tours were terminated by a Navy loss
- Response to sea pay
 - A \$50 increase in monthly sea pay decreased incomplete tours by
 - 4 percentage points for 36-month PSTs
 - 6 percentage points for 48-month PSTs
 - 2 percentage points for 60-month PSTs
- Using 48-month tours and FY01 dollars, the \$50 sea pay increase implies \$31,600 per additional sea year vs. \$37,200 compensation for an E4

The 2002 CNA study reported some alarming statistics regarding tour completion. Although the authors did their analysis and show some statistics for 36- and 60-month tours, most of the results they report concern 48-month tours because those were the most prevalent at the time. Also, they rarely separate first-term and career tours, which makes a substantial difference in completion rates.*

Their results for the responsiveness of completion and extensions to sea pay are a significant contribution, and we will use them in this annotated briefing to evaluate the effect of different policy initiatives.

One of the key points in this document is to update the data of the previous study.** Depending on the type of analysis, we can add 4 to 8 years of data. For some simple statistics, they used all the fiscal years in their data, or up to tours ending in FY 2002. For another analysis, they had to cut off the data at tours ending in FY 1998. This is because they wanted to track tour lengths up to 4 years past the Projected Rotation Date (PRD). Since we track tour lengths only up to 1 year past the PRD, and our data continue into FY 2007, we can look at tours ending as late as FY 2006.

*We define first-term as Sailors who are in Zone A and on the first tour; career is Zone B or higher on the second or third tour.

**Both papers report all results using the fiscal year in which a tour ended because, if we count tours using the begin date, there will be many that are ongoing at the end of the data.

Summary: Unadjusted and adjusted completion rates



- Without adjusting for why a tour is terminated, a high percentage of tours are incomplete*

PST	Term	
	First term	Career
36 month	N/A	28
48 month	42	41
60 month	78	N/A

- But many tours end because the Sailor leaves the Navy
- If Navy losses are excluded, the percentage of incomplete tours falls

PST	Term	
	First term	Career
36 month	N/A	18
48 month	15	29
60 month	52	N/A

*FY 2000-06 data. Not Applicable (N/A) means that there are too few data in the cell to be analyzed.

Our results highlight the importance of several factors. First, the reason for leaving a tour is a major determinant of completion rates. A high percentage of Sailors do not complete their tours because they leave the Navy before their PRD. Tours that are not Navy losses end because Sailors change their type of duty before the end of the tour. This is referred to as “rolling early.”

Differentiating why tour obligations are not met is important because when most people think about completion rates they are thinking about Sailors’ willingness to complete sea tours. This focuses on people who roll early and policies designed to induce Sailors to remain at sea rather than seek shore tours. Tours that end because of Navy losses, however, are primarily retention or attrition problems. The importance of tours that are not completed due to Navy losses should not be ignored, but different issues and policies are relevant for Navy losses.

The second important issue is that differences in incomplete tours vary by term and PST. In every case we examine, longer PSTs have more incomplete tours. Some important findings follow:

- For first-term Sailors, 48-month PSTs have among the fewest incomplete tours and 60-month PSTs the most.
- Longer tours are also more likely to be incomplete for career Sailors.
- Comparing adjusted data where we can look at tours with the same PST (48-month), career Sailors have more incomplete tours than first-term Sailors. The reason overall completion rates are higher is that more career Sailors serve in shorter PSTs where more tours are completed.

Summary: Reasons for leaving tours



- There are two broad reasons why tours are terminated (either before or after the PRD)
 - Navy losses
 - End of contract
 - Attrition
 - Moving to another type of duty
- Here are the percentages of tours that end with Navy losses*

PST	Term	
	First term	Career
36 month	N/A	30%
48 month	56%	29%
60 month	64%	N/A

*FY 2000-06 data

First-term Sailors are much more likely to end tours because they leave the Navy. Only about 30 percent of first-term tours ended with a return to shore duty. More than half of career Sailors, however, left their tours with a return to shore duty—58 percent with 48-month tours and 69 percent with 36-month tours.* This is one reason why the adjusted percentage of incompletes, shown on the previous slide, changes more for first-term than career tours.

From here on in the summary, we will examine only the tours that end with a roll to another type of duty (shore duty here). That way we can concentrate on tours that are left incomplete due to early rolls rather than Navy losses.

Tours that are incomplete due to a Navy loss should not be ignored. If these Sailors remained, they would provide more sea duty by experienced personnel. Also, these losses would not have to be replaced by new recruits who would incur recruiting and training costs. Many issues and policies that apply to early-rollers, however, would be different for Navy losses.

*These data are for all year groups, FY 1994-99 and FY 2000-06, and for all sea tours.

Summary: Timing of losses



- The timing of losses adds information to completion rates
 - For example, two tour types may have the same percentage of incomplete tours, but the percentage ongoing $\frac{3}{4}$ into the tour is 90 for one and 70 for the other
- Differences in timing between 48- and 60-month first-term tours are the most pronounced
 - Here is the percentage of first-term tours still ongoing at the $\frac{3}{4}$ point*

		1994-99	2000-06
All sea	48 months	80	92
	60 months	81	72
Sea intensive	48 months	89	90
	60 months	83	74

*For this chart and the rest in the summary, the results are for adjusted tours.

The timing of losses refers to the percentage of tours that are still ongoing at any point in time.

In this table, we show summary statistics from the cases where the difference in losses is most pronounced. At the $\frac{3}{4}$ point in the tour (36 months for 48-month tours and 45 months for 60-month tours), differences in losses between 48- and 60-month tours were rather small in the earlier period.* By the more recent period, however, the percentage of ongoing tours rose for 48-month PSTs and fell for 60-month PSTs. The result was a pronounced difference in timing: the percentage of tours ongoing at the $\frac{3}{4}$ point was 20 points greater for 48-month compared with 60-month tours for all sea and 16 points greater for sea intensive.

*We will discuss how we chose these year groups when we provide details on our data set.

Summary: Average time served per tour



- The average number of months per tour depends on completion rates and when Sailors leave tours
- Here are average months per tour*

PST	Term	
	First term	Career
36 month	N/A	35.7
48 month	49.5	45.3
60 month	51.4	N/A

- For first-term, a 12-month difference in PST length is associated with only 2 more months of sea time
- For career, the same difference in PST length is associated with 10 more months of sea time

*FY 2000-06 data

Average actual months per tour gives a measure not just of completing tours but also when Sailors leave incomplete tours and how many days are contributed by personnel who stay in their tours beyond the completion point.

- For first-term, 48-month tours, months served exceeds the PST (FY 2000-06 adjusted data). This reflects the high number of tours completed and the high number of months contributed by Sailors who serve 7 or more months beyond the PRD.
- For first-term, 60-month tours, months actually served is 86 percent of the prescribed tour length.
- As a result, Sailors on 48-month tours spent an average of 49.5 months in their tours compared with 51.4 months for 60-month tours—a difference of only 2 months in actual time compared with a 12-month difference in obligated sea duty.
- All other tour types, terms, and PSTs come close to fulfilling their obligations with actual months served ranging from 93 to 99 percent of the PST.

For the average career tour, 36-month obligations were almost always met. With average actual months served of 45.3 months, 94 percent of the obligation for 48-month tours was met.

A comparison between first term and career can be made for 48-month tours. The average time is 4 months lower for career tours.

Summary: Sea-intensive and shore tour comparisons



- There is little difference between sea-intensive ratings and all ratings
 - The greatest difference is in loss types: sea-intensive tours are 4-7 percentage points more likely to end in Navy losses
 - The only difference in completion rates is for 60-month tours, and here sea-intensive tours are more likely to be completed
 - Examining individual ratings would strengthen these conclusions
- Completion rates are higher for shore tours, and there are also differences in loss types and extended tours
 - For 36-month career tours, 18% of sea tours are incomplete compared with 11% of shore
 - More shore tours (11 percentage points) end with Navy losses
 - Most Sailors fulfill their obligations, but few return to sea or extend tours

Our analysis does not support the hypothesis that there might be more difficulty with completion rates or time served for sea-intensive tours. In fact, the only difference in completion rates is that, for 60-month tours, 5 percentage points more sea-intensive tours are completed. Another finding for sea-intensive tours is that they are more likely to be terminated by the Sailor leaving the Navy.

In our analysis, we compare entire Navy averages to averages for a small group of sea-intensive ratings. Averages can always conceal differences between individuals, and we are not able to compare individual ratings because of data limitations. We do, however, show that Sailors in the small subgroup of sea-intensive ratings behave virtually the same as those in all ratings. It is unlikely that one or two ratings in the group could drive this result.

We cannot compare sea and shore tours for first-term Sailors because sea and shore PSTs do not overlap. There are not enough data to analyze 36-month sea tours or 48-month shore tours. All we can do is to compare sea and shore for 36-month career tours and then compare 36-month first-term and career shore tours.

Given what we can compare, shore tours have high completion rates. Only 11 percent of 36-month, career shore tours are not completed. Also, a high percentage of shore tours end in Navy losses rather than rolling to a sea tour. Finally, out of the 89 percent of successful shore tours—meaning tours that at least meet the completion point—relatively few continue more than 6 months beyond the PRD. So, Sailors almost always complete shore tours; after completing, however, relatively few stay on in their shore tour or go to a sea tour. This suggests that Sailors may take these tours expecting to serve out their Navy careers.

Summary: Policy effects



- Goal is to generate more years of sea duty
- Options
 - Increasing mandatory sea duty may not be an effective strategy
 - Incentives for completing long tours are relatively expensive
 - Using combinations of sea pays and reenlistment bonuses is cost-effective and allows Sailors to choose
 - New incentive pays, Sea Duty Incentive Pay (SDIP) in particular, are promising but as yet untested

Using the most recent data, the difference in average months of sea duty served on 48- vs. 60-month PSTs was only 2 months—much less than the 12-month difference in PSTs. Given this, it seems that lengthening PSTs may not be effective. Even paying incentives so that more Sailors complete long sea tours is not cost effective. We estimate that this would cost \$73,000 per year of sea duty compared with the \$59,000 enlisted programming rate for E4s. One reason the policy does not work well is that it focuses on increasing completion rates rather than generating sea duty. Another is that Sailors on longer tours seem to be less responsive to extra compensation. An extra \$50 per month of sea pay reduces the percentage of incomplete tours by 6.2 and 2.3 points on 48- and 60-month tours, respectively [1].

The most cost-effective way of increasing sea duty is a mix of correctly structured sea pays and SRBs. Sea pays can be structured to retain more Sailors on sea duty tours or to lengthen tours of Sailors who are not leaving the Navy. In addition, SRBs can be targeted to specific ratings/NECs that have sea manning problems. SRBs are also targeted at the reenlistment point so that they can reduce tours that are incomplete because of Navy losses. If these tools are designed optimally and used in the right combinations, they can provide extra sea duty at fairly low costs. Analysts found that, using these policies, an extra year of sea duty costs from \$10,000 to \$50,000. This policy recommendation follows the often suggested combination of offering incentives and allowing Sailors with the greatest inclination to accept them. Choice-based policies are usually less costly and better for morale.

There are also several newer options for increasing sea duty. SDIP may be the most promising option because it can be targeted by skill and paygrade right to the Sailors who can best provide extra sea duty. SDIP pays Sailors to extend their sea tours or to cut shore tours short and take on a sea tours. This pay was started in March 2007, however, so there has not yet been time to test and evaluate it.

We consider mostly the options of mandating more sea duty or offering monetary incentives to voluntarily induce more sea duty. There are, of course, other policy options that can be used in conjunction. Nonmonetary incentives, such as homebasing, may be a good way to compensate for longer sea tours. In addition, changing the nature of sea duty or the quality of work may be important.

Outline



- Introduction and summary
- **Data and analytical approach**
- Results for all sea tours
 - Raw completion rates
 - Loss types
 - Adjusted completion rates
 - Timing of losses
 - Average months of sea duty per tour
- Comparison with sea-intensive tours
- Comparison with shore tours
- Effect of policy changes
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Data description



- Data set of 445,783 tours provides detail by
 - Fiscal year
 - Length of prescribed sea tour (PST)
 - Term
 - Rating
 - Reason for terminating the tour
- Covers tours ending in FY 1994 to 2006
- Exclusions are made for interrupted sea duty, female Sailors, small PSTs, ratings with CONUS/OUTUS rotations, and other irregularities
- Data sources
 - PST lengths are taken from NAVADMINs on Sea-Shore Rotation policies
 - CNA's Enlisted Master Record (EMR) data identify and track tours

We define first term as Zone A Sailors on their first sea tours. Career tours are those in Zone B or higher with two or three sea tours.

Type duty codes are 1 and 6 for shore and 2 and 4 for sea; 3 and 5 are eliminated.

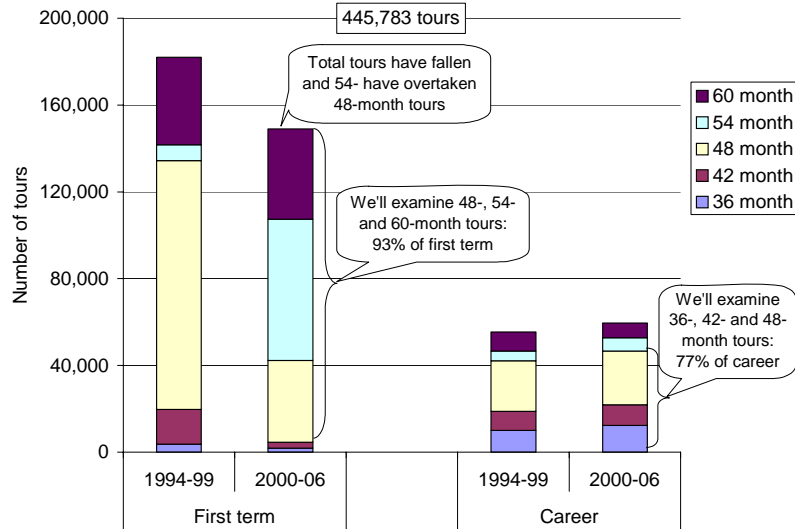
The NAVADMIN Sea-Shore Rotation policies are issued at irregular intervals and assign tour lengths by rating/rate and NEC. The latest revision is NAVADMIN 130/06. We did not use this new instruction, however, because our latest tours end in FY06 and would have begun at least 3 years before this.

We exclude tours based on several criteria:

- An interrupted tour is one that goes into a non-full-duty status, such as training, medical, or legal. We exclude interrupted tours because it is difficult to determine whether changes are the continuation of the original tour or the beginning of a new one.
- We exclude female Sailors because many (especially back to tours ending in FY 94) still serve in tours that are structured differently.
- For different times and ratings, there are a sizable number of entries in the Navy's rotation instructions with nonstandard PSTs. We exclude these because the number of tours in any one of these PSTs is too low to analyze.
- We exclude ratings that have rotations from continental United States (CONUS) to outside the United States (OUTUS) because tour lengths and the type of duty differ from standard sea-shore rotations.

For more detail, see "Backup 1: Data description" and "Backup 2: Exclusions."

All sea tours: Distribution by PST, term, and fiscal year groups



This slide shows distributions by PST, term, and two FY groups. Here we see that different PSTs contained most of the observations for the two different terms. To avoid trying to analyze small sample sizes, we focus on the 48-, 54-, and 60-month PSTs for first term and 36-, 42-, and 48-month PSTs for career.

To analyze changes over time, we divide the data into tours that end between FYs 1994 and 1999 and tours that end between FYs 2000 and 2006.* This division is somewhat arbitrary, but it reflects some important distinctions between the later and more recent periods. In particular:

- The total number of tours per year becomes stable in the later period. It declines from around 29,000 in FY 1994 to 20,000 in FY 1999. The number then levels off at around 18,000 per year in FY 2000–06. In this slide, the decline in the number of first-term tours is immediately apparent. This is neither a change in the intensity of sea duty nor a shortcoming in our data. Instead, the decline corresponds to falling endstrength over this period.**
- In many cases, completion rates become relatively stable across years in the later period and range from 30 to 40 percent. Rates are more volatile in the earlier period, especially for FYs 1994–95 when completion rates were around 20 percent.

We will commonly describe time trends with these two year groups. At appropriate points, we will describe only the recent period. Year-by-year measures are given in backup pages.***

*We define the FY for all tours as the FY in which the tour ends.

**See “Backup 3: Decline in tours corresponds to decline in endstrength.”

***For example, Backups 4 and 5 provide detail on PST distributions.

Defining tours, completing, and extending



- Tours end when a Sailor moves from one full-duty status to another or leaves the Navy
- Complete tours fall within a 12-month window around the PRD
 - Allows leeway for distribution issues and recording errors
 - Departure dates are clustered in this window and previous researchers have used it
- Extended tours are those that continue beyond the end of the completion window
 - Extensions are merely long tours; we have no information on whether papers are signed
 - With a 12-month completion window, extensions begin 6 months after the PRD
 - To use tours that end in the most recent FYs, we cut off measuring tour length at 1 year after the PRD
 - Exact dates for extensions longer than 1 year are not recorded; instead, we combine, and give the same length to, all tours that are still ongoing after 1 year

We define a tour as the time between a Sailor entering one type of duty and switching to another type of duty or leaving the Navy. For example, if a Sailor switches from shore to sea duty, he has begun a sea tour and we assign him a PRD based on the PST length for his rating or Enlisted Management Community (EMC). At the last date of full-duty sea status, we compare the duration of time on sea duty with the assigned PRD. We define tours by moving from one type of duty to another rather than by assignments to specific commands because changes of Unit Identification Code (UIC) are irrelevant. A Sailor can move from one command to another (e.g., split sea tours) without interrupting his or her sea obligation.

We chose a 12-month window in part to be consistent with [1]. To illustrate, a 48-month tour would be counted as complete if it were terminated between 42 and 53 months. To see the effects of wider or narrower completion windows, consider the results using adjusted completion rates for first-term, 48-month PSTs with averages over 2000–06:

- Using a 12-month window, 52 percent complete their tours.
- Using a 6-month window, 35 percent complete their tours.

Extended tours are simply long tours; they do not reflect formal extension agreements. For example, with a 48-month tour, extensions would begin at 6 months after PRD, or 54 months into the tour. We count the exact length of all extensions up to 12 months after PRD, or, in this case, month 60. All tours still ongoing after 60 months are placed in a 61+ category. Although we get truncated data on the length of long extensions, this approach has the advantage of making more recent data available because one does not have to allow more years to see how many tours continue past further points.

“Complete” vs. “incomplete” is an imperfect metric



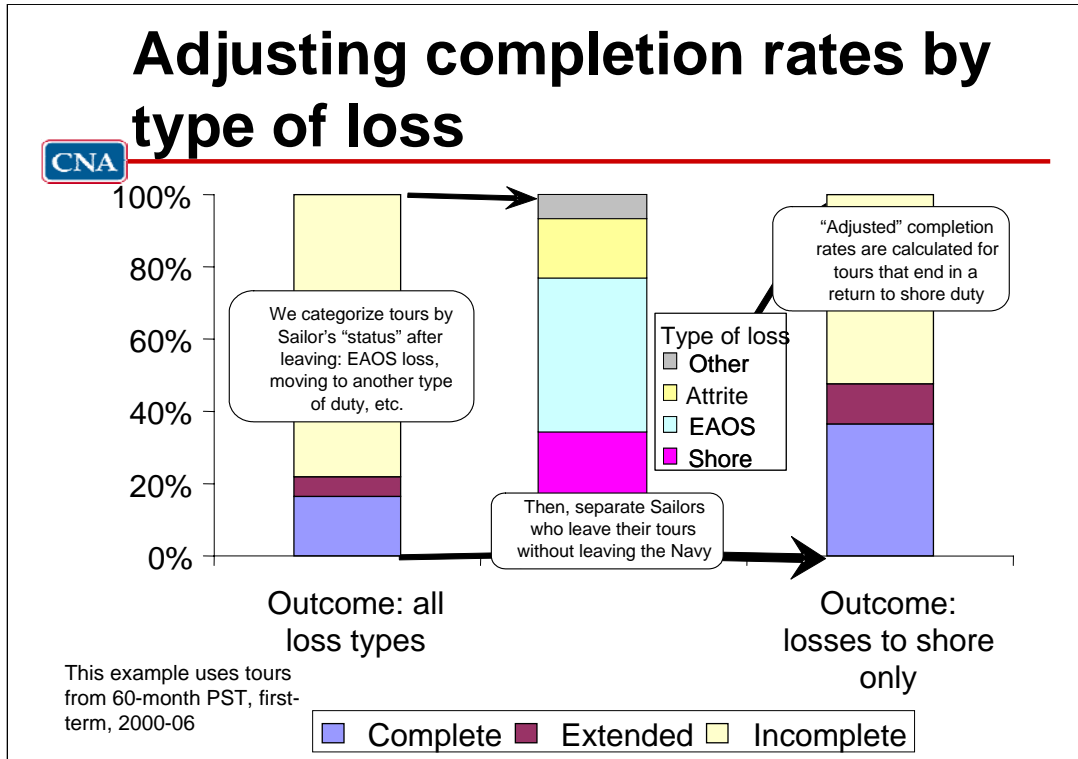
- A better metric is the average amount of sea duty per tour
 - Completion rate is one element
 - How long Sailors stay on tour (either before or after completing) is another element
- Also important: Are tours incomplete due to Navy losses or rolls to another type duty?
 - We focus on tours that aren't completed due to rolling early
 - Tours that aren't completed due to Navy losses should not be ignored
 - Different loss types require different policies

Simply measuring whether a Sailor meets his or her initial obligation goes only part way to determining how much sea duty is provided by each Sailor; when a Sailor leaves the tour is also important. The timing of losses refers to the percentage of tours that are still ongoing at any point in time. The timing of losses adds information to completion rates. A Sailor who does not complete and leaves early in the tour provides less sea time than one who does not complete but leaves later in the term. Another factor is that some Sailors not only complete their tours but remain after the completion point.

Distinguishing why tour obligations are not met is important because when most people think about completion rates they are thinking about Sailors' willingness to complete sea tours. Some tours are not completed because Sailors change their type of duty (sea to shore or shore to sea) before the end of the tour. This is referred to as “rolling early.” One set of policy concerns addresses inducing Sailors to remain at sea rather than seek shore tours.

A high percentage of Sailors who do not complete their tours, however, are leaving the Navy. This occurs most often with the end of active obligated service (EAOS), but attrition also plays a role for first-term Sailors.

It is important to know if the tour ended because the Sailor left the Navy or because he or she rolled. Either reason for leaving represents a loss in sea duty relative to the original PST. Some losses due to leaving the Navy, however, are inevitable and others would best be addressed by retention policies.



This chart gives a graphical representation of how we go from “raw” to “adjusted” completion rates.* The idea is to isolate tours that ended with a return to shore duty.

On the left, we see the percentage of tours that are complete, extended, or incomplete using raw data that include every reason for leaving. We then look at the Sailor’s next status after leaving the tour. Many can be seen as having an end-of-contract or an attrition status when they leave the tour. These are counted as Navy losses.* Sailors who have none of the loss codes are assumed to have rolled back to shore duty. (This rolling can be either early or after an obligation is met).

Of the data that include all loss types, we isolate tours that end without the Sailor leaving the Navy. We can then calculate completion rates, timing of losses, and average amounts of sea duty per tour using only the adjusted data.

Many losses occur on reaching the end of a contract. One policy option considered because of this is to vary contract lengths by exercising short-term extensions so that PRD and EAOS coincide. Another is to set contract lengths to 48 months past the end of training. All such policies have implementation issues and compensation costs. In general, offering incentives for more sea duty, regardless of contract or PST length, is likely to be the most cost-effective and best accepted policy.

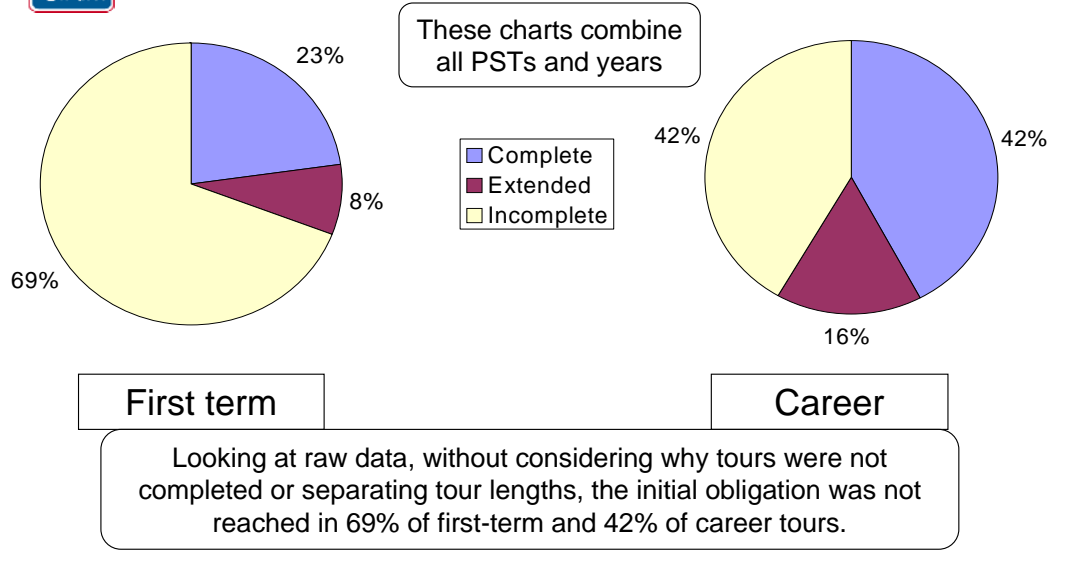
*We defined two more categories that we refer to as “limbo.” We consider losses to be clearly EAOS or attrition if the Sailor is out of the Navy by 3 months after the loss code. There are other records, however, that record an EAOS or attrition loss, but the Sailor remains in the Navy after 3 months. We recorded both EAOS and attrition limbo losses. In our summary charts, though, we will combine the two categories into “Other.”

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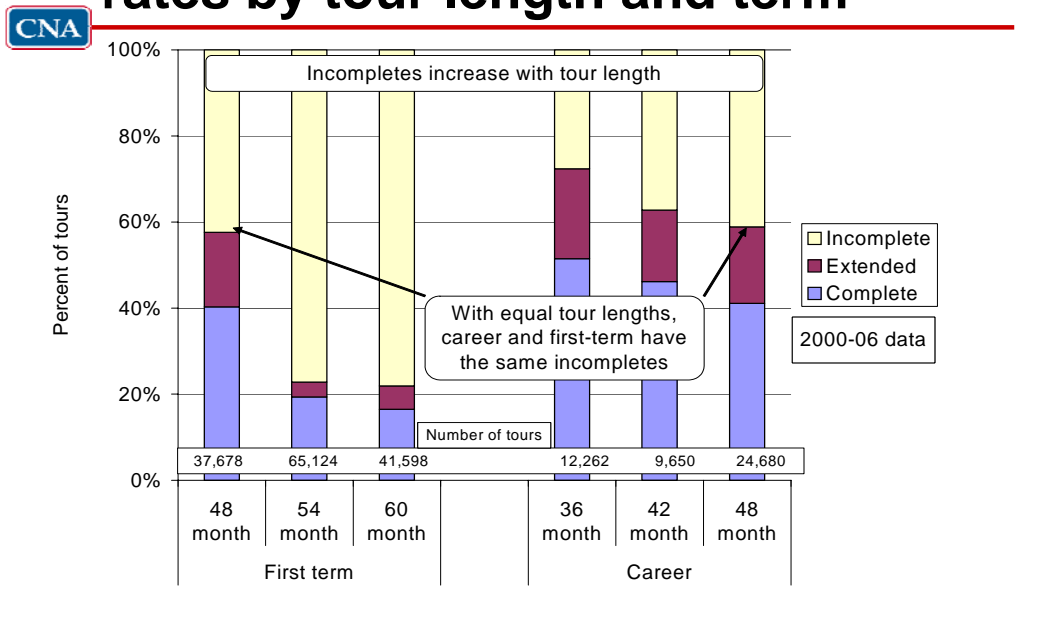
Sea tour completion without adjusting for Navy losses



For comparison, we will look at a few results on tour completion using raw data that still include tours that were ended by Navy losses. It is important to remember that incomplete tours will become lower with the adjusted data. Also, this figure obscures differences by tour length. This figure shows the most general results that we will consider, combining all the years and PST lengths with only first-term and career comparisons.

Using this highly aggregated, unadjusted data, it appears that career Sailors are more likely to complete their tours than first-term Sailors. The difference is quite large: About 70 percent of first-term tours are incomplete compared with about 40 percent for career tours. As we will see, this difference disappears once we look only at Sailors who are rolling to shore and compare equal prescribed tour lengths.

Variation in unadjusted completion rates by tour length and term



This chart shows results from the most recent time period, tours ending in FY 2000 through FY 2006. These rates vary from the earlier time period (FY 1994 through FY 1999) in that the percentage of incompletes falls for 48-month tours, both first term and career.* One striking result here is that the percentage of incomplete tours increases for longer tours. This pattern will remain for the adjusted data, although the overall percentage of incomplete tours will be lower.

We have seen that, looking at aggregate data, career tours are more likely to be completed. This chart, however, shows that the percentage of incomplete tours is virtually the same for 48-month career and first-term tours. The lower percentage of incomplete career tours when PSTs are combined happens because career Sailors are concentrated in shorter PSTs where completion rates are higher.

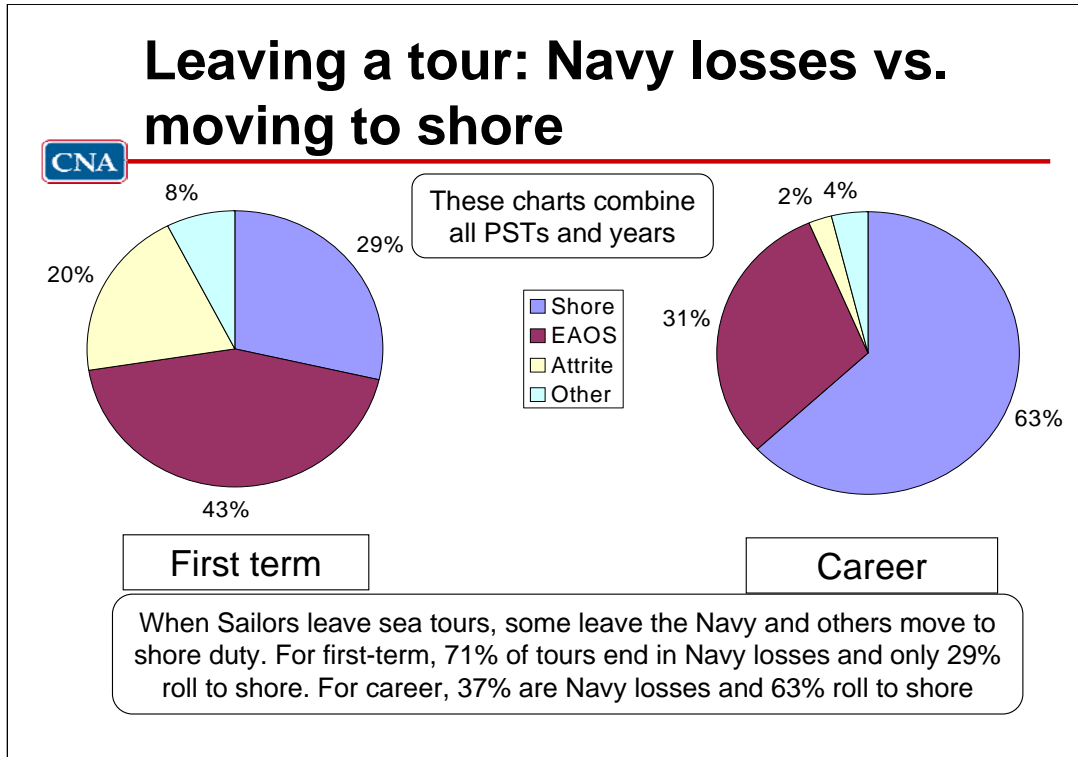
*See "Backup 6: Unadjusted sea tour completion by year group."

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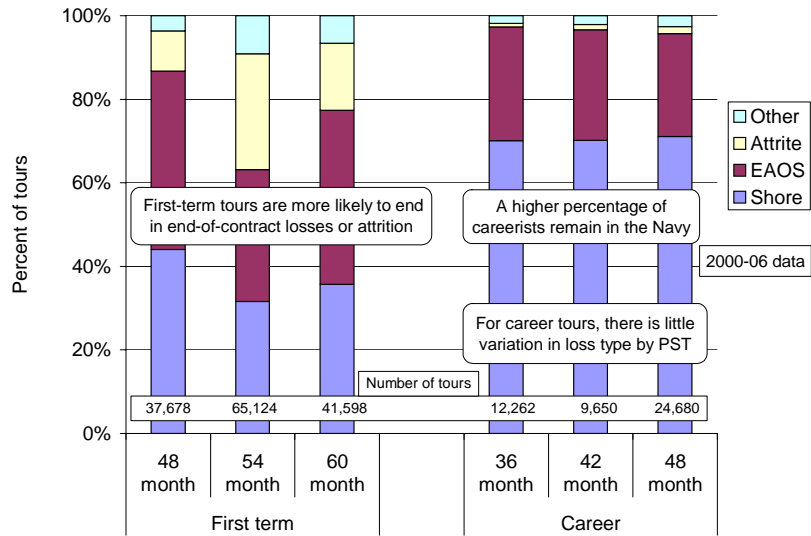
It is important to look at how tours are ended because it gives an idea of the magnitude of the change we make when focusing on tours that end in rolling to another Navy tour rather than leaving the Navy.

These aggregate data show a large difference between first-term and career tours.* The percentage of tours ending in Navy losses rather than rolling to shore duty almost reverses for the two terms. First term has about 70 percent of tours ending in Navy losses and 30 percent going to shore. Career has about 35 percent Navy losses and 65 percent going to shore.

The high percentage of first-term tours that will be removed from our analysis because they are Navy losses indicates that differences between raw and adjusted completion rates may be especially large in the first term.

*These charts combine all PSTs and year groups. They also include all outcomes (complete, extend, and incomplete) from the raw data. Navy losses combine EAOS, attrition, and other.

Variation in loss types by tour length and term



This slide looks at the distribution of losses from sea tours over different tour lengths within the first-term and career samples. First-term tours are more likely than career tours to terminate with a Navy loss.* This is true for all PSTs, although 48-month tours have a lower percentage of Navy losses.

For career tours, the higher percentage rolling to shore duty is almost constant across tour lengths. For loss types, there is a real difference between career and first term—not just a difference caused by aggregating different PSTs. If one compares 48-month rates (the only PST that the two terms have in common), there is a 27-percentage-point difference in tours ending with a Navy loss.

Implications of the differences in loss types by term follow:

- Tour types that have a higher fraction of Navy losses will have more tours removed when we move to the adjusted data.
- Tours ending with Navy losses are likely to have a higher percentage of incomplete tours.
- Removing a greater fraction of these tours with high loss rates will mean a larger improvement in completion rates.

*These data are for the more recent group, FY 2000–06. Backup slides 7 and 8 give variation by year group. The main difference between the two year groups is that Navy loss percentages increase for both first-term and career 48-month tours and first-term 60-month tours.

Incomplete tours caused by Navy losses should not be ignored



- In this paper, we focus on tours that are incomplete because the Sailor rolls to shore early
- Total years of sea duty can also be improved by reducing Navy losses from sea tours
 - Depending on term and PST, 30% to 70% of incomplete tours are due to Navy losses
 - Reducing EAOS and attrition losses during sea tours will reduce incomplete tours
 - Improving completion rates by reducing Navy losses during tours, however, depends on attrition and retention policies

We have seen that a high number of tours are not completed because Sailors leave the Navy. For most of our analysis, we will remove these Navy losses and focus on completion rates for Sailors who remain in the Navy. Total years of sea duty, however, can also be raised by increasing the number of Sailors who stay in the Navy.

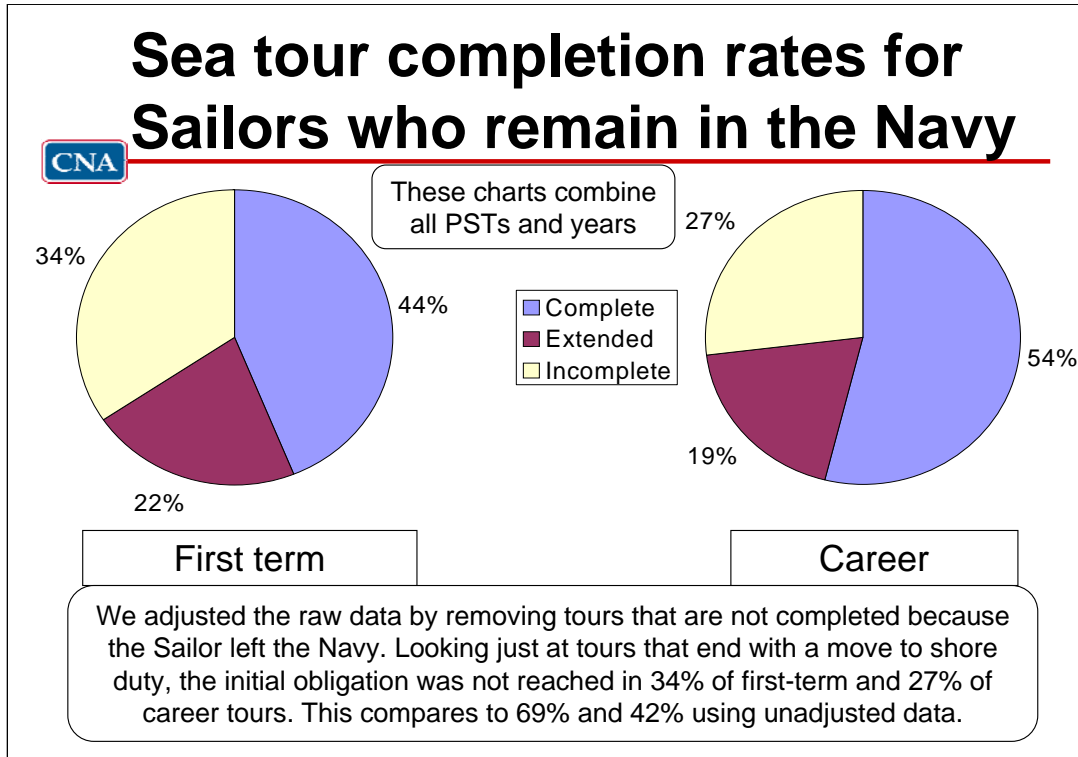
The optimal mix of policies to decrease the number of Sailors who leave the Navy while on sea tours will be different, however, from the mix of policies to increase the amount of sea duty contributed by Sailors who remain in the Navy. There is obviously some overlap because incentives to serve more sea time will also induce some Sailors to stay in the Navy. References [2, 3, and 4] discuss how different combinations of sea pay and Selective Reenlistment Bonuses (SRBs) affect retention and additional sea duty. We will return to these issues in the section on the effect of policy changes.

There are, of course, also differences between Navy losses caused by reaching the end of a contract and those caused by attrition. On one hand, EAOS losses reflect reenlistment rates and misalignments between contract and tour lengths. Attrition losses, on the other hand, can be lowered by effective attrition policies.

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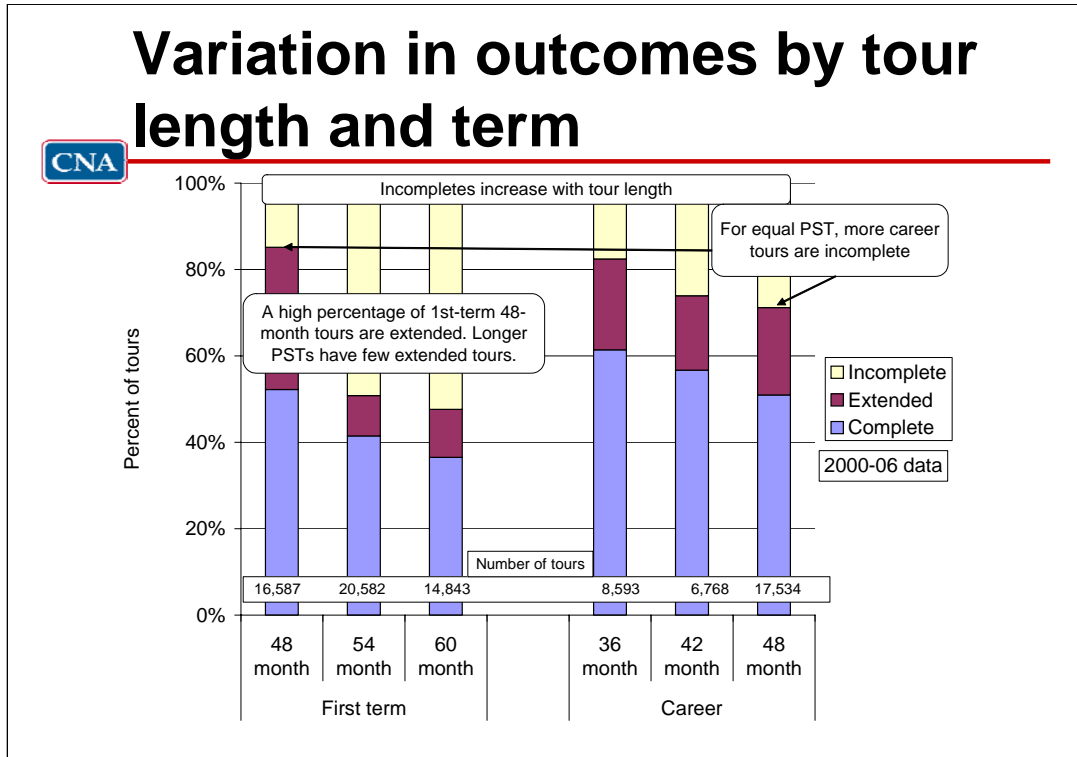


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With this highly aggregate data, we can already see the improvement in completion rates that comes about when tours ending in Navy losses are removed. It is not necessarily the case that Navy losses have a higher percentage of incomplete tours than tours that end with a return to shore duty. It could be that more Navy losses occur after the point at which tours are completed, or that Sailors roll to shore early in their contracts. However, common sense dictates, and our data confirm, that completion rates improve when tours ending in Navy losses are excluded. Why is it important to make this distinction? Reporting that 70 percent of first-term tours are not completed seems to imply that a very large number of Sailors are not fulfilling their commitments. If Sailors do not fulfill their tour obligations because they reach the end of obligated service before the PRD, however, this is something different.

Here we see that, if the Navy loss tours are removed, the percentage of incomplete first-term tours is cut in half, from around 70 percent to 35 percent. The percentage of incomplete career tours also drops, a little less dramatically, from roughly 40 to 25 percent.



Here we add differences by tour length to the aggregate picture on the previous page. As with the unadjusted data, the percentage of incomplete tours is uniformly higher for longer tours.

The percentage of successful (complete or longer) tours is remarkably high for 48-month first-term tours. Many of these successful tours are still ongoing at the end of the completion window (i.e., 7 or more months after PRD). The only other tour type with close to the same completion rate is 36-month career tours, but there are not as many tours continuing past the completion window. Extension rates are the lowest for the long first-term tours, but it is hardly surprising that few people want to serve past the completion window for 60-month tours.

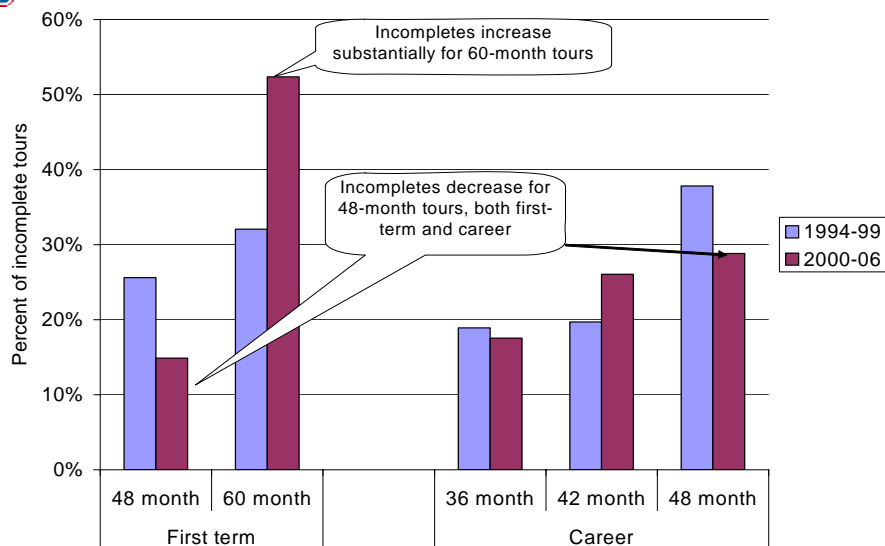
Comparisons of first-term and career tours must be properly evaluated here, too. The overall percentage of incomplete tours is 34 for first-term and 27 for career—a difference of 7 percentage points. If we compare equal tour lengths, 48-month because that is the only PST that first term and career have in common, career tours actually have more incompletes than first term. Looking at the aggregate numbers, it is tempting to conclude that career Sailors do a better job of fulfilling their commitments. The truth, however, is that career Sailors have more tours with short PSTs and that completion rates are higher for shorter tours.

Of the many possible explanations for early rolls from sea tours, one is that a rating may be overmanned at sea, so that fulfilling PSTs becomes less necessary and some Sailors are sent to shore tours early. This explanation may not fit with our finding that completion rates for all ratings and sea-intensive ratings do not differ. One would expect fewer sea manning surpluses in the sea-intensive ratings and, therefore, fewer Sailors being sent back to shore early.

This study deals mostly with presenting the statistics about tour completion so that policy debates can be better informed.

*This slide shows tours ending in FY 2000–06 only. The following slide looks at changes over time.

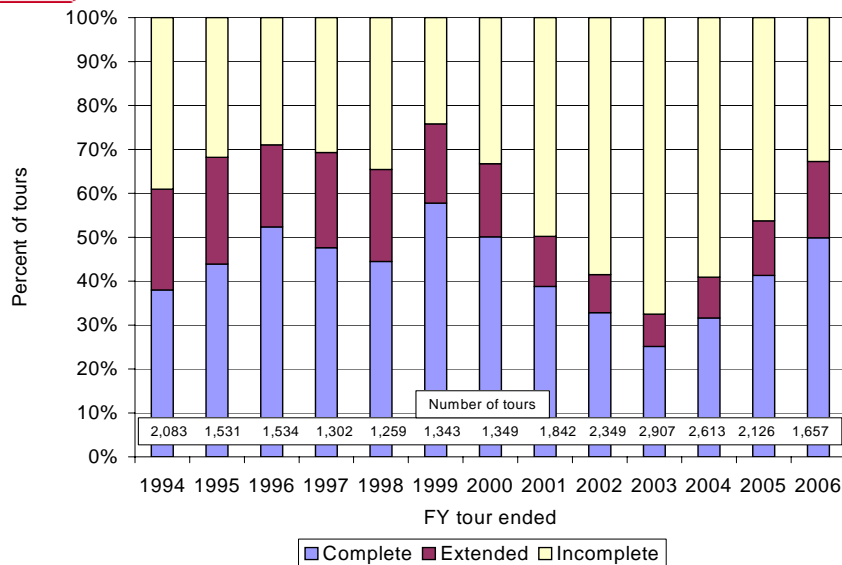
Changes in incomplete tours over time



The most interesting changes between the two time periods are in first-term 60-month tours and 48-month first-term and career tours.* These are interesting both for their large magnitude and because they are in the longer tours that are of most interest to policy-makers. The percentage of incomplete tours falls over time for 48-month tours, both for first-term and career Sailors. Sixty-month PSTs are becoming more common because of the need for more sea time in some ratings. For this reason, the increase in the percentage of Sailors who do not fulfill 60-month obligations is disturbing. We will now look at year-by-year changes for 60-month tours.

*We cannot compare 54-month tours over the two time periods because there are too few 54-month tours ending in FYs 1994-99.

Changes over time in completion rates for first-term 60-month PST tours



The percentage of incomplete tours was fairly stable at around 30 to 40 percent from FY 1994 to FY 2000. After FY 2000, incomplete tours rose dramatically to 67 percent in FY 2003, then steadily recovered again to 33 percent in FY 2006. It is probably too early to say that the improvement in completion rates in the past 3 years is a trend that will continue or even a level that can be sustained. It is interesting to note, however, that the low completion rates reported for the FY 2000–06 period probably result from the unusually low rates from FY 2002 to FY 2004 and that things seem to be improving again lately.

The pattern of incomplete tours for other PSTs and terms looks much different.* In particular, 48-month first-term and career tours do not have the dip from FY 1999 to 2006.* Instead, the percentage of incomplete tours falls gradually from FY 1994 to about 1999 and then levels off at the lower rate until FY 2006.

It is difficult to explain why this pattern occurs. First, since it is unique to first-term, 60-month tours, it must be explained by factors that did not affect 48-month first-term and career tours. Also, these data are only for tours that end in early rolls. Therefore, we cannot use explanations that include changes in completion rates caused by retention or attrition changes. The pattern of incomplete tours also does not seem to align well with other events and trends. For example, times of retention problems coincide with high completion rates and vice versa. Even if retention problems have an indirect effect on early rolls, it is hard to understand this link. Also, a 9/11 effect may be reflected in low completion rates, but the rates began to fall before 2001 and the effect is not present for 48-month tours. In some cases, a lack of demand for sea duty may affect how many tours are cut short. To test this hypothesis, we would have to compare manning at sea with completion rates and see if differences across tour lengths, time, and ratings make sense.

*Backup slides 9 and 10 show changes over time for first-term and career 48-month PSTs.

Where does excluding Navy losses make the greatest difference?



		Percent of incomplete tours*		
		Unadjusted	Adjusted	Delta
First term	48 month	42	15	-27
	54 month	77	48	-29
	60 month	78	52	-26
Career	36 month	30	28	-2
	42 month	36	37	1
	48 month	49	41	-8

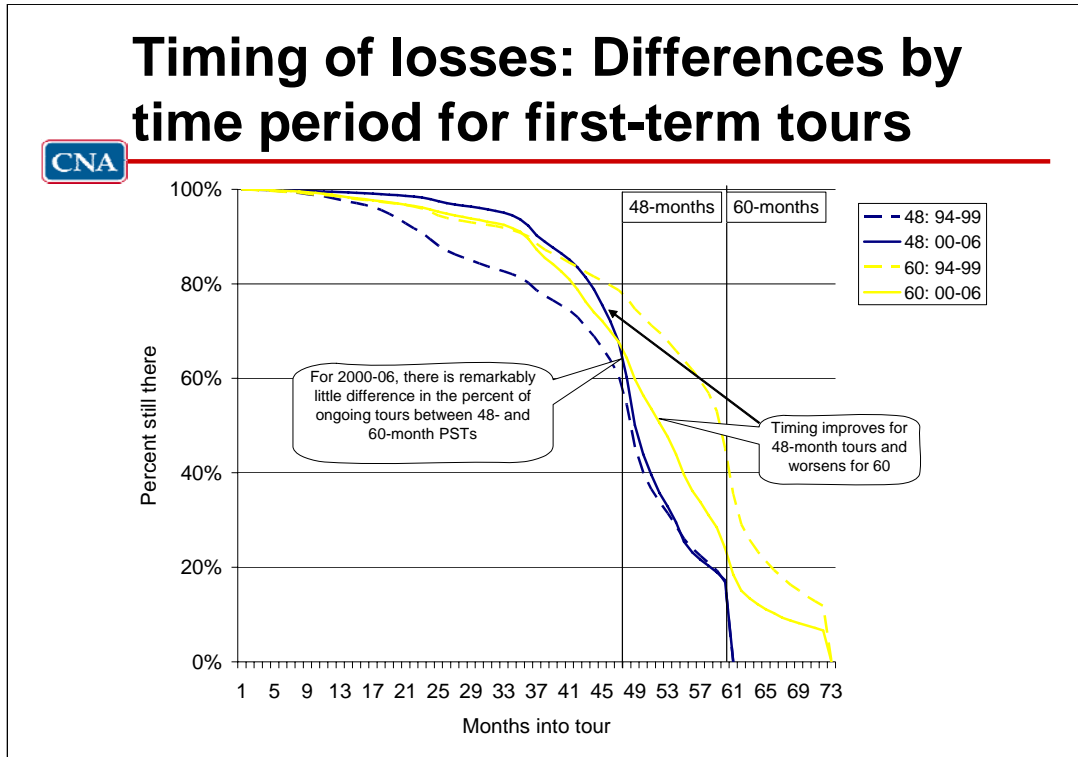
FY 2000-06 data

First-term changes are very pronounced: decreases in incomplete tours range from 26 to 29 percentage points. Career adjustments make much less difference. The only substantial decrease is 8 percentage points for 48-month tours.

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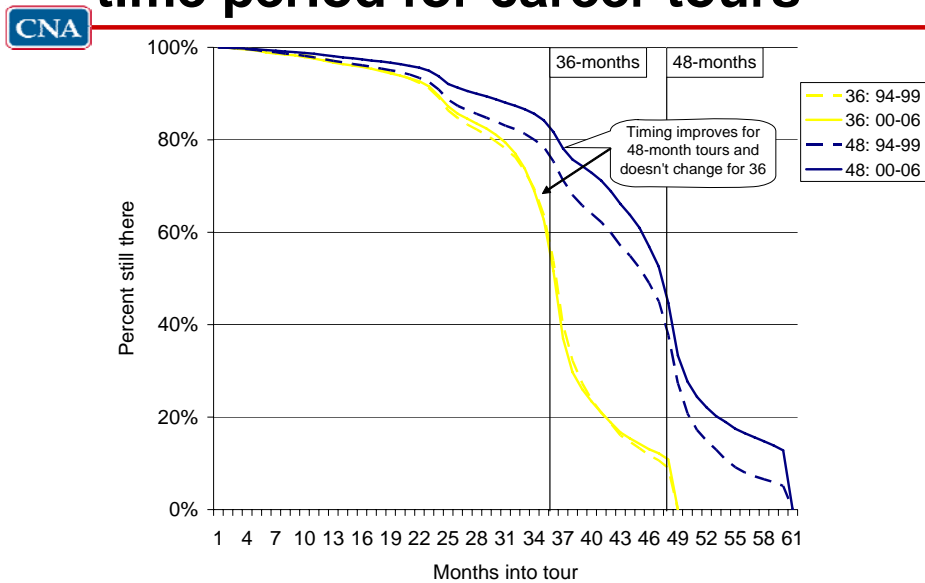
This slide shows the timing of losses—that is, the percentage of tours that are still ongoing at increasing months into the tour. The data here are for all first-term sea tours with 48- or 60-month PSTs. The chart illustrates how the timing of losses varies by tour length and time period.

For 60-month PSTs, loss timing becomes worse in the later period, and the discrepancy occurs fairly late in the tours. By 36 months into the tour, 90 percent of tours are still ongoing for both 1994–99 and 2000–06. By 48 months, however, the discrepancy in losses has become greater so that 77 percent of 1994–99 tours remain vs. 64 percent for 2000–06. By 48-months into the tour, the number of tours still ongoing begins to fall sharply. By the end of the 12-month completion period, (60 months into the tour), 21 percent of 1994–99 Sailors are still there compared with 11 percent of 2000–06 Sailors.

For 48-month PSTs, the timing of losses improves in the later period, and much of the improvement occurs early in the tours. By 24 months, 89 percent of 1994–99 tours remain vs. 98 percent for 2000–06. By 36 months, 80 percent of 1994–99 tours are still ongoing compared with 92 percent in 2000–06. For both time periods, most losses occur during the 12-month completion window, so that 31 percent of 1994–99 Sailors and 33 percent of 2000–06 Sailors still remain at the end of this window, or at 53 months.

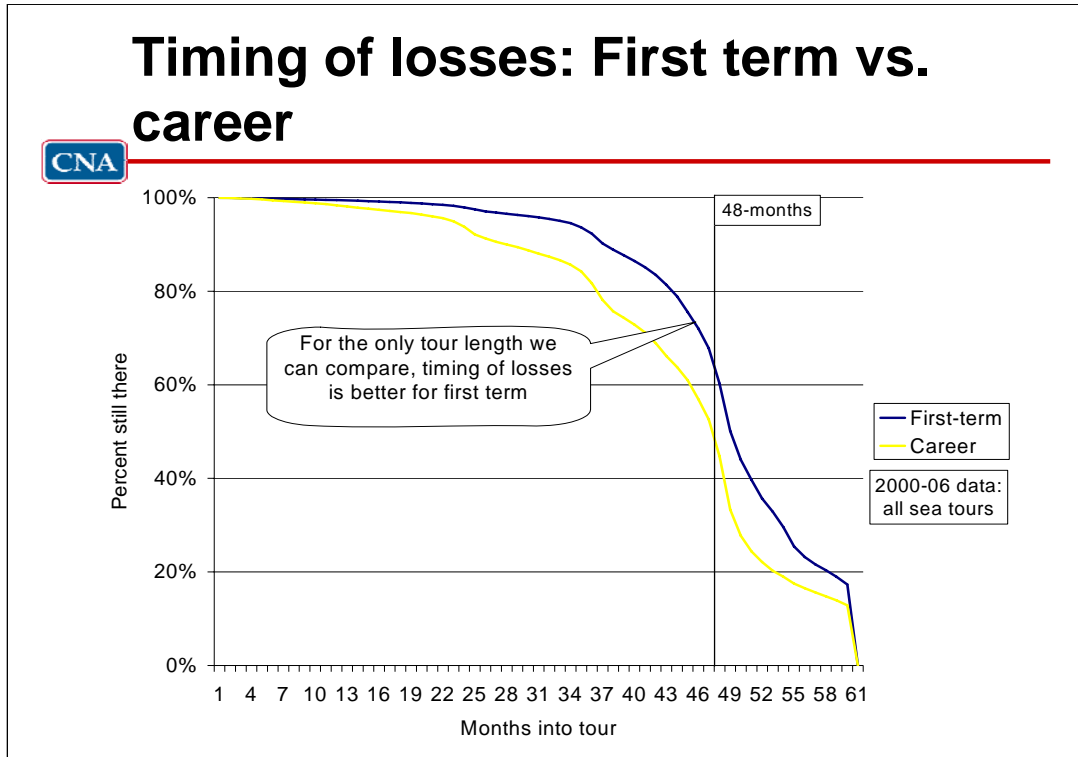
An interesting finding is the similarity in the number of Sailors still in their tours between 48- and 60-month PSTs for the most recent period. In the 2000–06 data, at 48 months into the tour, 60 percent of Sailors with a 48-month obligation were still there compared with 64 percent of those with a 60-month obligation.

Timing of losses: Differences by time period for career tours



For career tours, timing improves slightly for 48-month PSTs and does not change for 36-month tours.

Comparing career and first term, there is more of the expected gap between 36- and 48-month PSTs than there was between 48- and 60-month PSTs for first-term Sailors.



Comparing first term and career for 48-month tours, loss timing is better for first term.* That is, Sailors tend to leave career tours earlier than first-term tours.

The difference in timing worsens gradually. The difference between the percentage of first-term and career tours that are still ongoing at various times follows:

- 24 months: 4 percentage points
- 36 months: 11 percentage points
- 48 months: 16 percentage points (about the maximum difference).

When you get to the long extension point, 61+ months, 17 percent of first-term tours and 13 percent of career tours are still ongoing.

*This chart uses 2000–06 data only.

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Average actual vs. prescribed months on sea tour



2000-06 data

Only 2 month difference

PST	Average months per tour	Months under (over) PST	Months served as % of PST
36 month		N/A	
48 month	49.5	-1.5	103%
60 month	51.4	8.6	86%
<hr/>			
36 month	35.7	0.3	99%
48 month	45.3	2.7	94%
60 month		N/A	

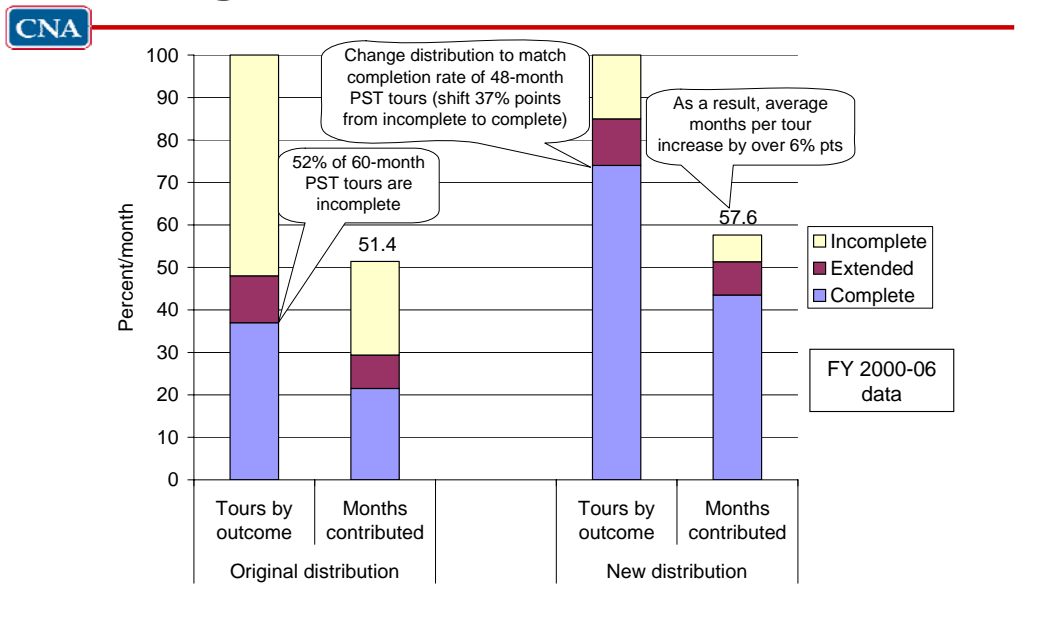
4 months lower than first-term tours

Perhaps the most remarkable result in this table is that there is only a 2-month difference in average sea duty time between 48- and 60-month PSTs. This is in contrast to a 12-month difference in the obligation. For 48-month PSTs, the 49.5 actual months per tour is 103 percent of the 48-month obligation. Time served per tour exceeds the prescribed length because so many Sailors complete their tours and many continue beyond the end of the completion window. For 60-month PSTs, the 51.4 actual months per tour is 86 percent of the 60-month obligation.

For the average career tour, 36-month obligations were almost always met. With average actual months served of 45.3 months, 94 percent of the obligation for 48-month tours was met.

A comparison between first term and career can be made for 48-month tours. The average time is 4 months lower for career tours.

Effect of changing completion rates on length of 60-month PSTs

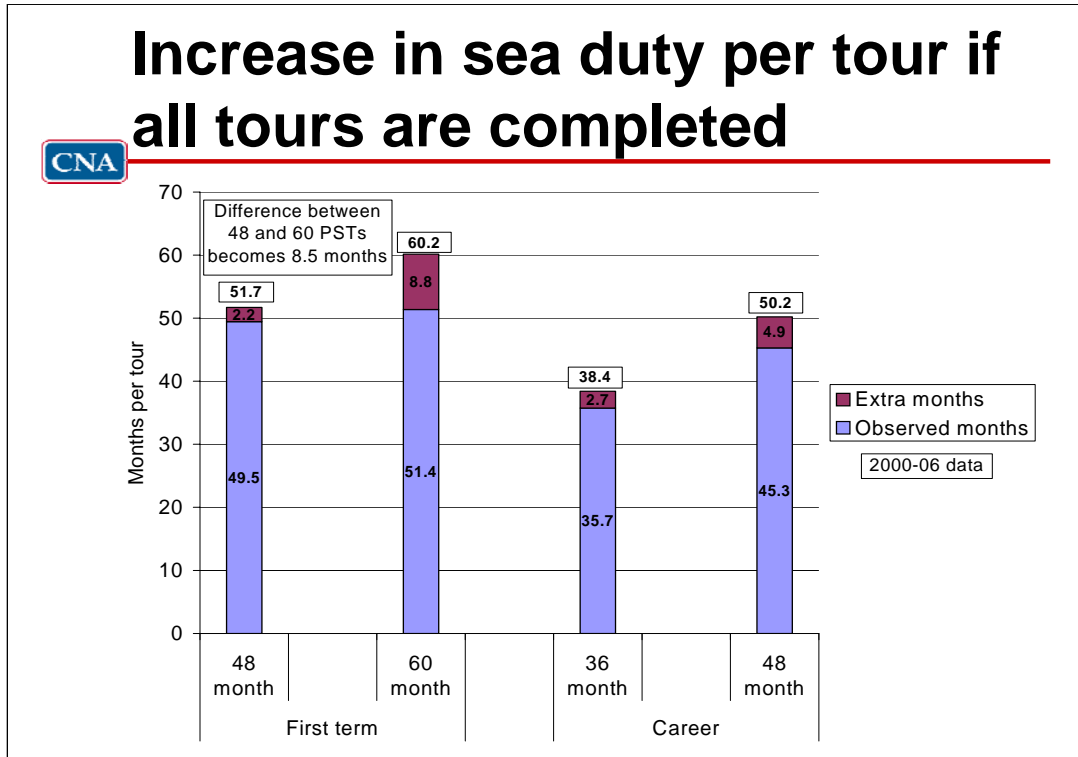


Average months of sea duty depends on two factors: (1) the average amount of sea duty contributed in each outcome and (2) the distribution of outcomes. For example, assume two tour types have the same percentages of complete, extended, and incomplete tours. In the second tour type, however, the incomplete tours occur later. This would give the second type more average days per person for incomplete tours and, hence, increase its total average months of sea duty.

Let us look at the difference in average months of sea duty for 48- and 60-month first-term tours from this perspective.* First, any difference in averages cannot be attributed to differences in average months per outcome. The two tour types have almost the same percentage of PST fulfilled for incomplete and complete tours (average days by outcome are higher for 48-month extensions; however, since extensions are so low for 60-month tours, this has little effect).

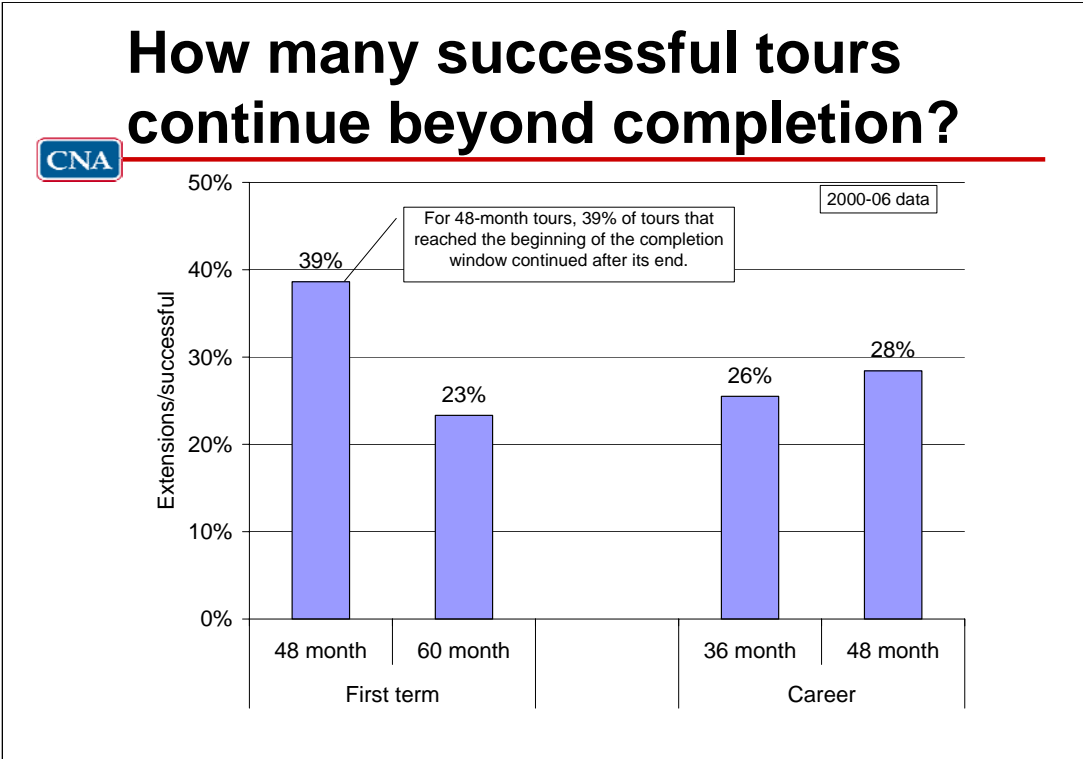
Differences in average months, therefore, must be caused by the differences in outcomes. In this graph, we illustrate how average months per tour would change if the distribution of outcomes for 60-month tours was the same as for 48-month tours. To begin with, 52 percent of 60-month tours are incomplete compared with 15 percent of 48-month tours—a difference of 37 percentage points. So, we increase the percentage of complete 60-month tours to 89 percent. Using this improved distribution of outcomes and the original months per tour in each outcome increases the average months served on 60-month tours from 51.4 to 57.6, an increase of over 8 percentage points. This means the difference between 48- and 60-month tours widens from 2 to over 8 percentage points.

*Backup slide 11 gives more detail on how completion rates and months served in different outcomes (incomplete, complete, and extended) influence average months served per tour.



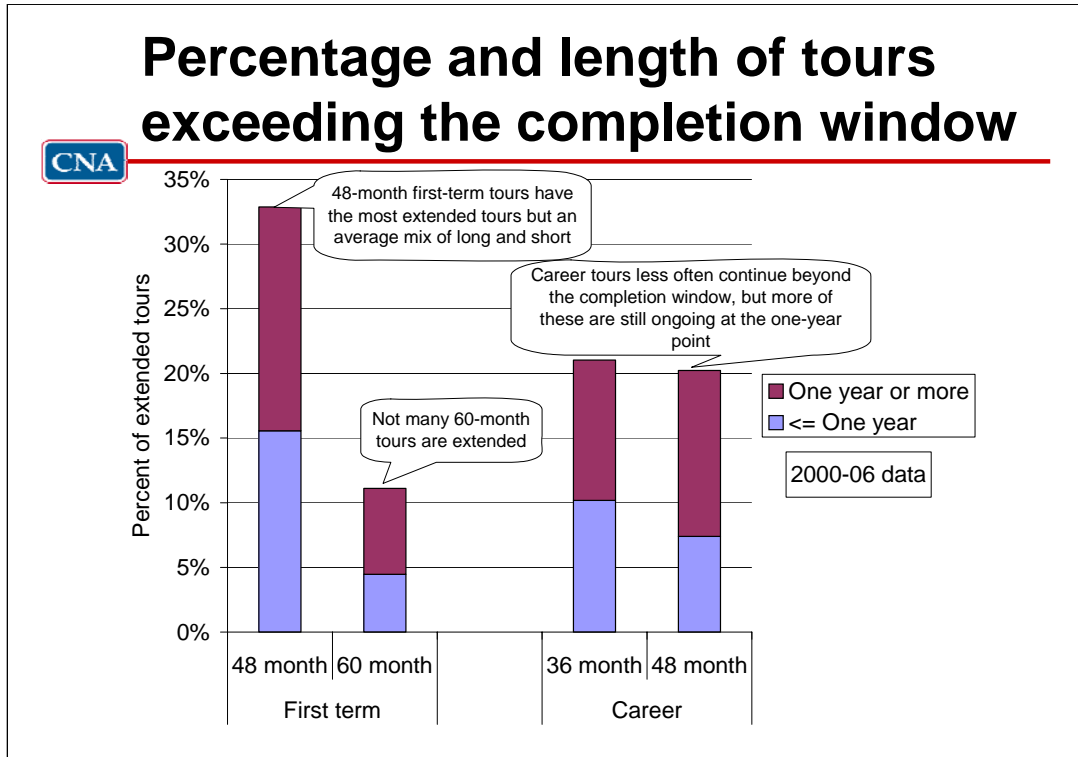
This figure shows how average sea time per tour would increase if all tours are completed. The increase is greater for tour types that have relatively more incompletes, so the difference between the first-term tours becomes 8.5 months. The months of sea duty also increase for 48-month tours so that now average months exceed prescribed months by 8 percent rather than the original 2 percent.

We do not show changes over time in the extra months because they are predictable. Since incompletes decrease from 1994–99 to 2000–06 for 48-month first-term and career tours, the improvement from eliminating them also decreases. Sixty-month tours, however, have substantially more incomplete tours in the later period, so the improvement from removing them is greater in the later period.



An important factor in the average length of sea tours is the number of tours that continue beyond completion and how long they continue. This chart shows tours that continue beyond the end of the completion window relative to all successful tours (tours that reach at least the start of the completion window). Defining extended tours as those that continue beyond the completion window, tours for first-term 48-month PSTs have a 39-percent probability of extending if the obligation is fulfilled—the highest of any tour length or term. The probabilities for other tour types do not vary much and are in a lower range of 25 to 30 percent. Sixty-month tours aren't likely to be extended because the initial obligation is long. Career tours, even when they are the same length or shorter than first-term tours, also have relatively few long tours.

Our findings regarding the percentage of successful tours that are extended differ from the results in [1], which reported 45 percent for 48- and 60-month tours.



In addition to the number of tours that exceed the completion window, the length of these tours obviously affects the average amount of sea duty per tour. This chart shows tours that end more than 6 months but less than 1 year beyond the PRD and tours that end 1 year or more beyond the PRD. These tours are given as a percentage of all tours in their term and PST. We have seen before that 48-month first-term tours have more long tours than any other term and PST. Here we look more closely at the length of extended tours.

Forty-eight-month first-term extended tours are divided fairly evenly between long and short (53 percent are long). Thirty-six-month career tours have the same mix. The difference is for extended 48-month career tours; 63 percent of the extensions are long.

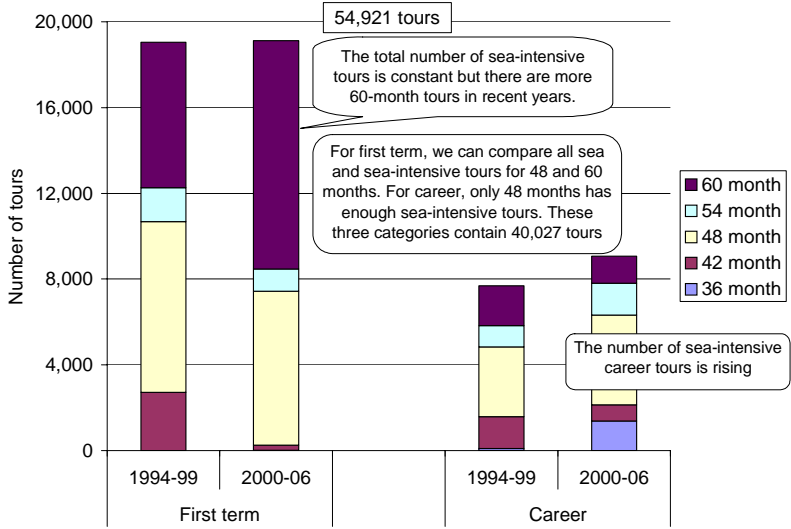
We truncate the length of tours that continue more than a year beyond the PRD. For example, 48-month tours reach the 1-year extension mark at 60 months. All tours that are still ongoing at that point are recorded as having a length of 61 months. This means that where there are relatively more long extensions, as for 48-month career tours, the total contribution of these tours to average months served will be understated.

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Sea-intensive tours: Distribution by PST, term, and year group

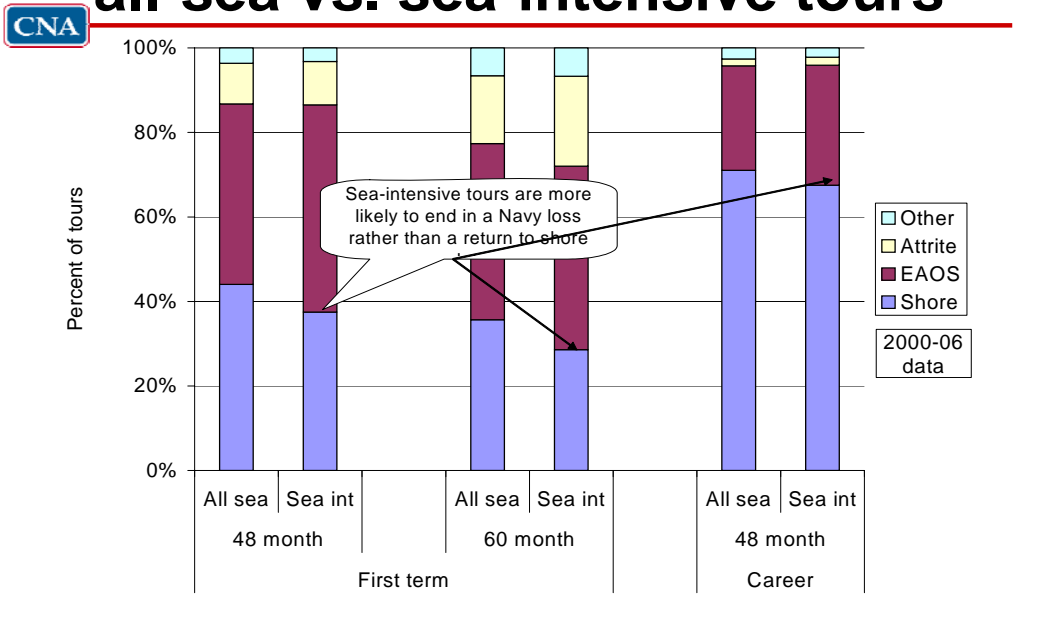


We made the same exclusions for the sea-intensive data set that we made for the full data set. These are described in “Backup 2: Exclusions.” After these exclusions, we have a data set of 54,921 sea-intensive tours that provides detail by FY tour ended (1994 through 2006), 36-, 42-, 48-, 54-, and 60-month PSTs, first term vs. career, and reason for terminating tour (EAOS loss, attrition, rolling to shore, and other).

The sea-intensive ratings and EMCs we use were provided by N13 staff. They are ratings or EMCs that currently have very high ratios of sea to shore billets. The ratings and EMCs are ABE, ABH, AT, AZ, GSM, OS, ENSW, EMSW, FCAEGIS, and ICSW.

We ended up analyzing only 48- and 60-month first-term tours and 48-month career tours because there are too few tours in other term and PST cells. These three categories contain 40,027 tours, or 73 percent of the original 54,921 tours.

Comparison of loss types for all-sea vs. sea-intensive tours

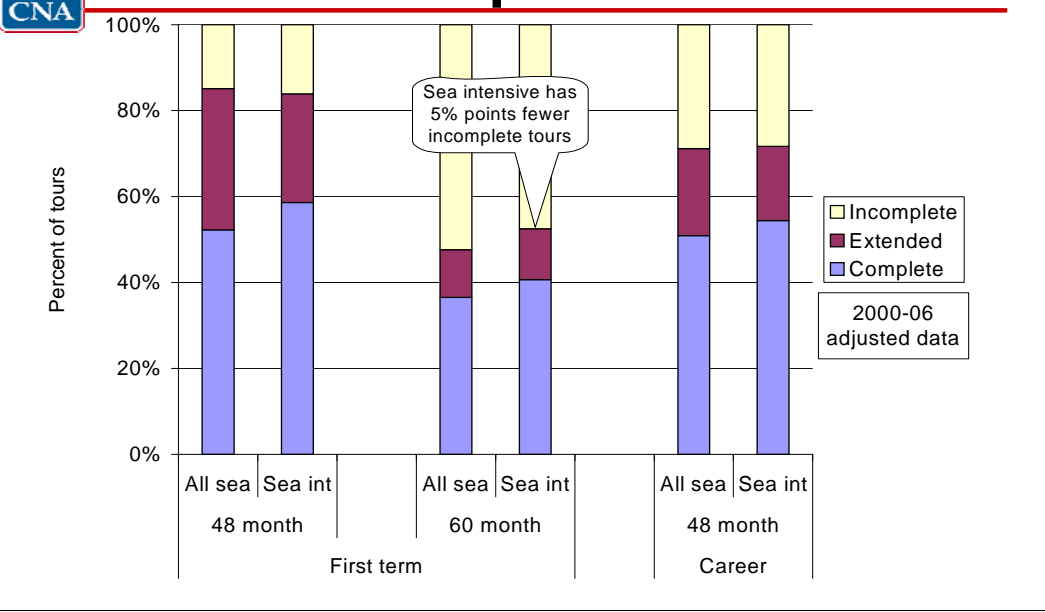


The major difference in loss types between sea-intensive and all-sea tours is that sea-intensive tours are more likely to end in a Navy loss rather than rolling to shore. This difference is 7 percentage points for first term and four for career. Also, within the increased Navy losses, sea-intensive tours displayed increased attrition from 60-month tours.

There are changes between FY 2000–06 and FY 1994–99 loss types. All tour types have a higher percentage of tours ending with a roll to shore duty in the more recent time period. The increase is somewhat lower for sea-intensive tours.*

* See “Backup 12: Loss types over time for all sea vs. sea-intensive tours” for more detail on 2000–06 loss types vs. 1994–99.

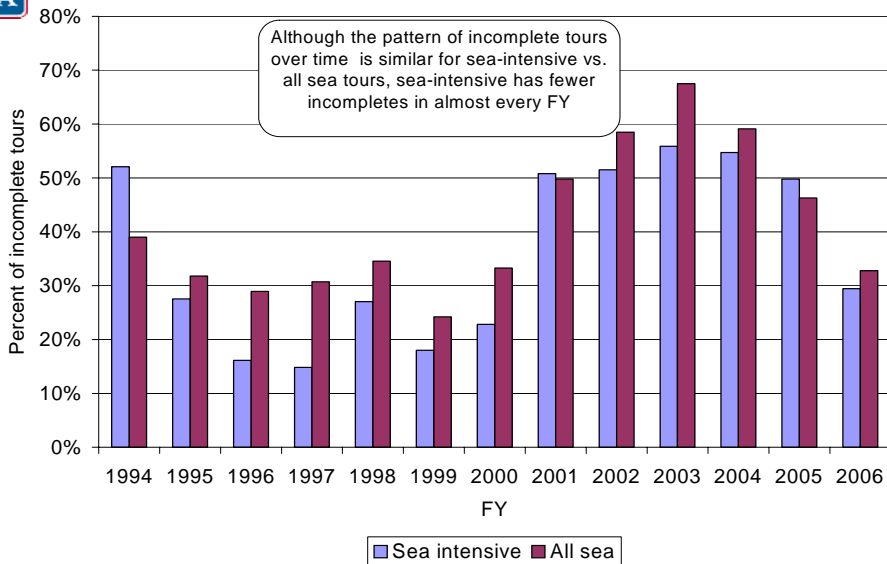
Comparison of all-sea and sea-intensive completion rates



For 48-month first-term and career tours, the percentage of successful tours (completed plus extended tours) do not vary much for sea intensive and all sea. The one difference is that, although total rates are similar, sea-intensive tours have relatively more tours that are just completed rather than extended.

For 60-month tours, there is a difference in completion rates, with sea intensive having 5 percentage points fewer incomplete tours.

Percentage of incomplete tours for 60-month sea intensive vs. all sea



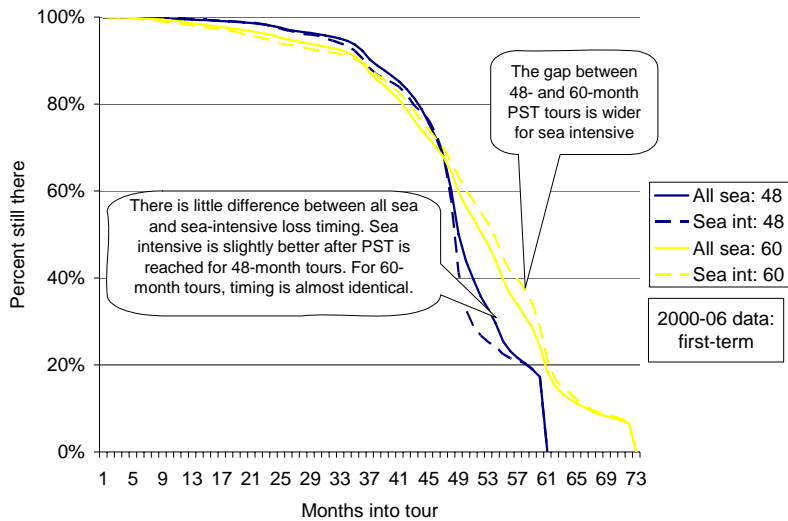
Since the difference between sea-intensive and all-sea tours is most pronounced for 60-month tours, this slide compares differences by FY in incomplete tours.

The pattern of incomplete tours over time is almost identical for the two groups: the percentage decreases for tours ending in FYs 1994 to 1996, levels out for 1996 through 2000, climbs from 2000 to 2003, and then drops again until 2006.

The percentage of incomplete tours, however, is consistently lower for sea-intensive tours except for three scattered years (FYs 1994, 2001, and 2005). The difference in the percentage of incomplete tours for sea-intensive ratings ranges from 3 to 16 percentage points.

A caveat to these results is that the sample sizes are rather small, especially for the sea-intensive data. Sea-intensive tours range from 150 to 575, and all-sea tours range from 1,250 to 2,900.

Timing of losses for all-sea vs. sea-intensive tours



This slide compares the timing of losses between sea-intensive and all-sea tours. We look only at first-term tours and use 2000–06 data.* There are some differences between the timing of losses in the FY 1994–99 and 2000–06 time periods. The largest change is that the timing of losses for 60-month tours gets worse in the more recent period for both all-sea and sea-intensive tours. In addition, the timing gets better for 48-month tours, but only for all sea.**

Looking at the recent period, there is very little difference in the timing of losses for tours in sea-intensive communities relative to all sea tours:

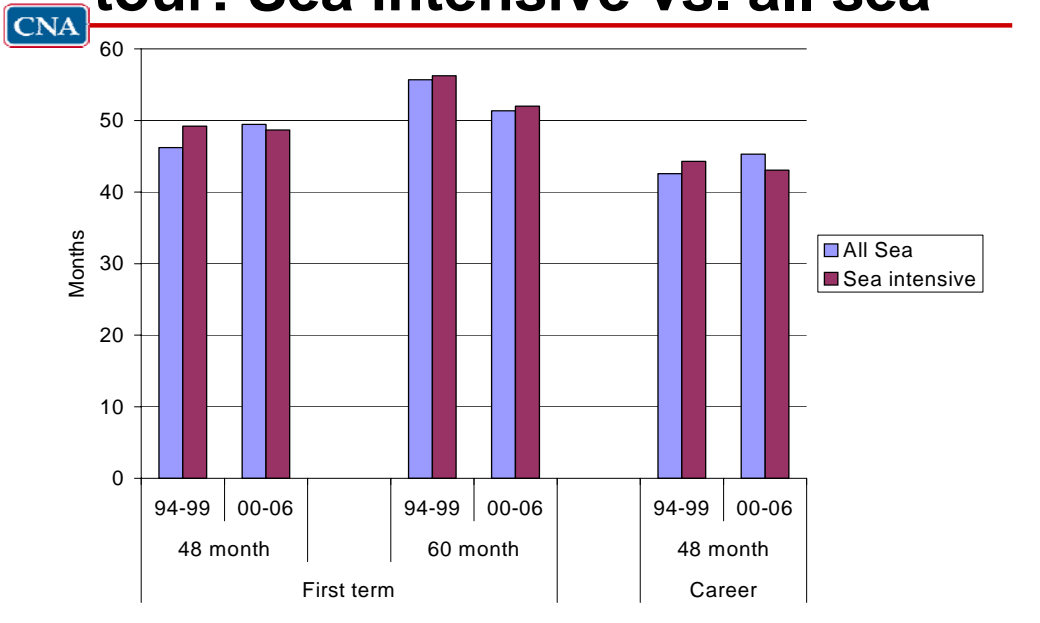
- Up to 46 months into the tour, the timing of losses is virtually the same in all categories. The percentage of tours still ongoing ranges from 70 to 73 percent for sea intensive vs. all and for 48- vs. 60-month PSTs.
- After 46 months
 - For 48-month PSTs, all sea improves relative to sea intensive.
 - For 60-month PSTs, sea intensive improves relative to all sea.

These changes are small, but taken together they widen the difference in timing by PST for sea-intensive relative to all-sea tours.

*There is no difference in timing between the two year groups for 48-month career tours.

**For all-sea tours, these changes are discussed on page 36 (“Timing of losses: Differences by time period for first-term sea tours”) and for sea-intensive tours in “Backup 13: Timing of losses: differences by time period for sea-intensive tours.”

Average months of sea duty per tour: Sea intensive vs. all sea



The differences in average months on tour between sea-intensive and all-sea tours are not dramatic. The biggest differences are that sea-intensive months are 6 percent higher for 48-month, first-term tours in the earlier period, while sea-intensive months are lower by 4 percent for 48-month, career tours in the more recent period.

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Outline



- Introduction and summary
- Data and analytical approach
- Results for all sea tours
 - Raw completion rates
 - Loss types
 - Adjusted completion rates
 - Timing of losses
 - Average months of sea duty per tour
- Comparison with sea intensive tours
- **Comparison with shore tours**
- Effect of policy changes
- Conclusions and recommendations

Shore tour comparisons



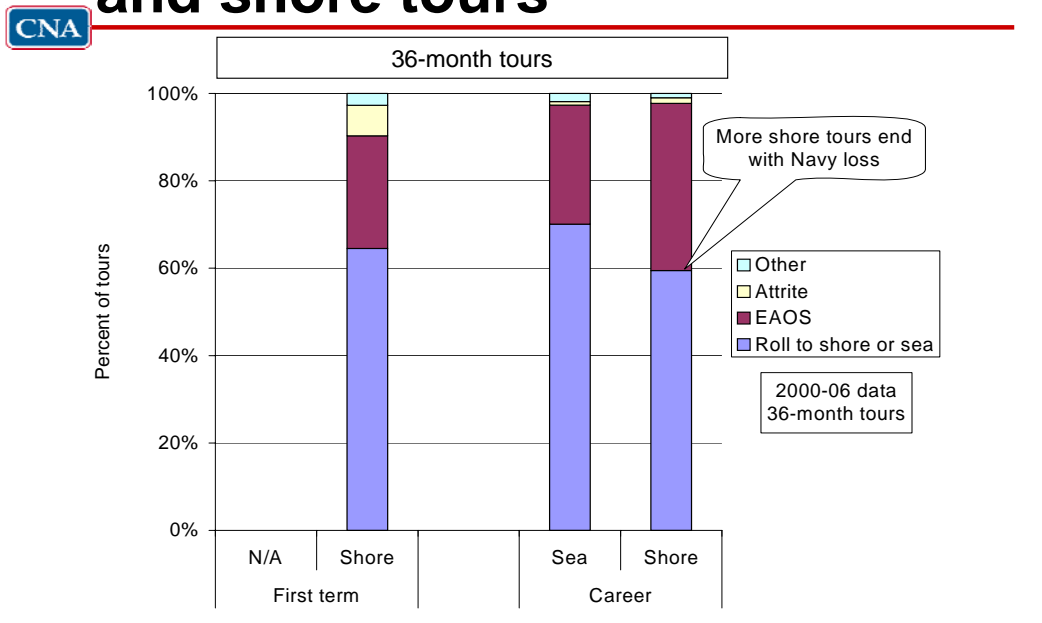
- 36-month shore tours total 176,153
 - 75,460 are first term
 - 100,693 are career
- No comparisons can be made between sea and shore tours for first-term Sailors
 - The longest shore tour PST for which we have enough data is 36 months
 - The shortest sea tour PST is 48 months
- First-term 36-month shore tours are distributed across a wide range of ratings

The shore tour data set was constructed using the same exclusions as the all-sea and sea-intensive data. Only 36-month PSTs are analyzed because there are too few tours in any other term by PST cell.

On one hand, it is difficult to make comparisons between sea and shore tours for first-term Sailors. Their sea tours are almost all 48 months or longer. On the other hand, the only significant number of first-term shore tours are of 36 months. In addition, the sea tour that is closest to the length of the 36-month shore tour, which is 48-month shore tour, has much different completion rate patterns.

There was a concern that first-term 36-month shore tours were concentrated in a few ratings or communities. This is not true, though the tours are distributed over a wide number of ratings. Even after excluding ratings with fewer than 100 tours, which removes 1 percent of the sample, 64 ratings are left. Of these 64 ratings, 23 have at least 1,000 tours.

Comparing loss types for sea and shore tours



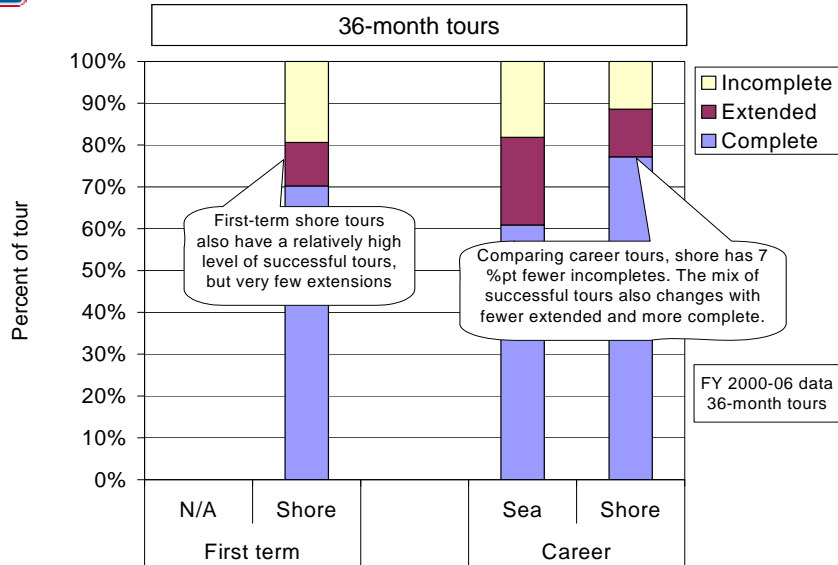
The most remarkable feature of this chart is that, comparing 36-month career tours, more shore tours end with Navy losses.* The difference is about 10 percentage points. This implies that more Sailors leave the Navy from shore than from sea tours.

Comparing 36-month first-term and career shore tours, career tours once again have more tours ending with Navy losses. The difference here, however, is only half as much.

For first-term Sailors, we cannot make comparisons of shore and sea tours with equal PSTs. This is because there are not enough 48-month shore-duty observations or enough 36-month sea-duty observations.

*We use FY 2000–06 data in this figure. There are no differences between the two year groups for career tours. However, first-term tours had a 10-percentage-point increase in tours ending with a change to sea duty.

Comparing adjusted completion rates for sea and shore tours



The percentage of incomplete tours is 7 percentage points lower for shore than sea tours comparing 36-month career tours.* For both 36-month first-term and career shore tours, the percentage of tours that continue past the completion window is very low—almost as low as that for 60-month tours. Remember that we define extensions as simply remaining in the tour beyond the completion window rather than executing a formal extension. Therefore, even if first-term Sailors are not, by policy, allowed to extend shore tours, a small fraction do remain in their tours for at least 6 months beyond their PRD.

*This chart uses adjusted completion rates—that is, only tours that ended with a return to sea duty rather than in a Navy loss. It uses 2000–06 data and only 36-month PSTs.

Timing of losses and average months per shore tour



- The timing of losses does not differ among 36-month tours, either by sea and shore or by term
- Average months per tour are the same for sea and shore and vary only by term
 - For career, 35 to 36 months are served whether sea, shore, FY 94-99 or FY 00-06
 - For first-term, the average is 33 months

The timing of losses for 36-month tours does not differ much by sea, shore, career, or first term. The only difference is slightly better timing for career shore tours. There is also little difference over time period for either first-term or career shore tours.*

*See “Backup 14: Timing of losses for shore vs. sea tours” and “Backup 15: Timing of losses: differences by time period for shore tours” for more detail.

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Policies to increase years of sea duty



- Goal is to generate more years of sea duty
- Policy alternatives
 - Lengthen prescribed tour lengths
 - Buy higher completion rates for long PSTs
 - Use different structures of monetary incentives
 - Sea pay
 - SRB
- Enlisted programming rate is the baseline for comparing costs per extra year

The ultimate goal of any policy should be to increase years of sea duty, particularly for skills and paygrades that are undermanned at sea. Although more tours will be completed and extended as a result of increasing sea time per tour, the focus should be on how much sea time is increased rather than how many more tours are completed.

We consider mostly the options of mandating more sea duty or offering monetary incentives to voluntarily induce more sea duty. There are, of course, some other policy options that can be used in conjunction. Nonmonetary incentives, such as homebasing, may be good ways to compensate for longer sea tours. In addition, changing the nature of sea duty or the quality of work may be important.

Given what we now know about completion patterns, we can examine the costs and benefits of different policies designed to increase man-years of sea duty. All of the policies can be compared with the cost of paying one more Sailor, that is, increasing endstrength. For this baseline comparison, we use the FY 2008 enlisted programming rate for E4s of \$59,344.

Prescribing longer tours



- Increasing mandatory sea duty may not be an effective strategy
- The results of increasing PSTs by 12 months are
 - Only 2 more average months of sea duty per tour for tours that end by rolling to shore
 - Including tours that end in Navy losses, months of sea duty only increases by 0.3
- Shorter PSTs combined with incentives allow Sailors with higher preferences for sea duty to supply the extra man-years
 - Sailor choice helps morale
 - Less costly because Sailors who like sea duty require lower incentives

At least for first-term Sailors, it seems that making more sea duty mandatory may not be the most effective strategy. As we have seen, the average months of sea duty per tour are 49.5 for 48-month tours and 51.4 for 60-month—a difference of only 2 months.* This is primarily because more 48-month tours are extended and fewer 60-month tours are completed. These averages take into account only tours that end in a return to shore duty. When tours that end in Navy losses are included, averages become lower for both tour lengths, but the comparison becomes even worse. Including all reasons for incomplete tours, the average months of sea duty for 48-month tours is 41.3 compared with 41.6 for 60-month tours; increasing tour lengths by 12 months only increases actual sea duty by 0.3 month. The difference becomes smaller because EAOS and attrition losses are so much higher for 60-month tours. In the recent period, using unadjusted data, the percentage of incomplete tours was 42 percent for 48-month tours compared with 78 for 60-month tours.

Not only are increases in mandatory tour lengths ineffective, they do not allow Sailors to choose how long they serve at sea. If the Navy relies on shorter tours and incentives for voluntary choices of more sea duty, it will induce Sailors with greater preferences for sea duty to serve longer. In general, voluntary choice is preferable to mandates because it increases morale and decreases costs. Costs are lower because less money is needed to induce people with greater propensities to serve more sea time.** The high proportion of Sailors on 48-month tours who extend shows that there are people who are willing to serve longer tours. These Sailors are extending either in response to the existing Sea Pay Premium (SPP) or because they prefer sea duty enough they do not need extra monetary incentives.

*All results are based on FY 2000-06 data.

**Reference [5] discusses the benefits of incentive pays and voluntary choice.

Increasing completion rates for long PSTs



- Reduce the percentage of incomplete 60-month tours by 5 percentage points
- Start with elasticities from previous paper
 - For 60-month tours, \$50 extra sea pay per month decreases incomplete tours by 2.3 percentage points
 - A 5-percentage-point decrease requires \$108.50 extra sea pay
- Assume that there are 10,000 tours and that the timing of losses within outcome categories stays constant
- The results are:
 - Amount of sea duty increases by 15 man-years
 - Total cost is \$1,085,000
- The cost per extra year of sea duty is about \$73,000
- Policy is not cost-effective compared with programming rate of roughly \$59,000
- Sailors on 60-month tours are less responsive to pay; this makes policy costly

In this exercise, we will start with the 60-month tours that have 45 percent incomplete tours and 51.4 average months of sea duty per tour. One policy alternative is to retain the 60-month PST and increase compensation in a way that improves completion rates. Here we determine the cost and benefits of reducing the percentage of incomplete tours by 5 percentage points, or to 40 percent.*

We start with the elasticities estimated in CNA's previous paper on tour completion [1]. The authors estimated that, for 60-month PSTs, a \$50 increase in sea pay per month would increase completions by 0.8 percentage point and extensions by 1.5, meaning incomplete tours would go down by 2.3 percentage points. Converting the reduction in incomplete tours from 2.3 to 5 percentage points requires a \$108.50 rather than a \$50 increase in sea pay.

We assume that there are 10,000 tours and that the timing of losses within outcome categories remains constant. That is, a portion of incomplete tours are moved to complete, but the distribution of losses over time for the remaining incomplete tours remains constant..

*We use first-term, 60-month data from 2000–06 for this exercise. The data are adjusted by removing tours that end in Navy losses.

The result is that sea duty increases by 1.25 months, or 15 years. Given that the extra sea pay is \$108.50 per tour and there are 10,000 tours, the total cost of the policy is \$1,085,000. Dividing by the increase of 15 man-years gives a cost of \$72,575 per year of sea duty. Compared with the \$59,344 E4 enlisted programming rate, this policy is not cost-effective

One reason that a policy designed to increase completion rates among Sailors who roll to shore will be relatively costly is that it is not targeted correctly. Giving a bonus designed to meet a completion goal would provide the same extra money to a Sailor who moves from three-quarters through his tour as to a Sailor who is only 1 month into the tour. A better policy would aim to achieve the same amount of extra sea duty from both.

Another reason is that here we have tried to induce more completions and extensions on 60-month PSTs. In reference [1], Sailors on 48-month PSTs were more responsive to extra compensation than those on 60-month PSTs. The same extra \$50 of sea pay would increase completions by 3.3 percentage points and extensions by 2.9, thereby reducing incomplete tours by 6.2 percentage points rather than the 2.3 for 60-month tours. This reflects our finding that 48-month tours have greater completions and extensions than 60-month tours.

There are several caveats to our estimates. The elasticities of 1.5 and 0.8 were estimated based on all incomplete tours, not just tours that were incomplete due to rolling early. Here we have applied the increased sea pay just to those who are rolling early. Obviously, it would be impossible to identify Sailors who were going to roll early and offer the pay only to them. If the extra sea pay is offered to everyone, two things will happen. First, some of the Sailors who left the Navy will stay in and provide additional sea duty; this will increase the extra man-years of sea duty generated. Second, costs increase by the additional number of Sailors who take the sea pay. Whether the cost per extra year of sea duty increases or decreases depends on how Sailors who reenlist to get the extra pay behave. That is, do they contribute more or less than the 1.2 extra months of sea duty per tour contributed by those who rolled to shore?

Using sea pay and SRBs



- CSP and SPP can be used in different ways, depending on the goal
 - Not the best retention tool, but aligning increases with retention points could help
 - Tours of Sailors who do not leave the Navy could increase by further skewing payments toward Sailors with more consecutive sea duty
 - A graduated SPP, in which payments increase as consecutive years of sea duty increase, could also help extend tours
- SRB varies across skills and is targeted at reenlistment points
 - Superior tool when a subset of ratings have sea-shore imbalances
 - It may be valuable given that a high percentage of incomplete tours are due to EAOS losses
- Previous analysts have found that sea pay and SRB policies can generate extra sea time at costs of \$10,000 to over \$50,000 per extra man-year
 - Most combinations are cost-effective compared with programming rate

The most cost-effective way of increasing sea duty is a mix of correctly structured sea pays and SRBs. Sea pays can be structured to retain more Sailors on sea duty tours or lengthen tours of Sailors who are not leaving the Navy. In addition, SRBs can be targeted to specific ratings or NECs that have fewer sea billets filled. SRBs are also targeted at the reenlistment point so that they can reduce the high number of tours that are incomplete because of Navy losses. If these tools are designed optimally and used in the right combinations, they can provide extra sea duty at fairly low costs. Analysts found that, using these policies, an extra year of sea duty costs from \$10,000 to \$50,000. This policy recommendation follows the often suggested combination offering incentives and allowing Sailors with the greatest inclination to accept them. In general, choice-based policies are less costly and better for morale.

Several studies have examined the results and cost-effectiveness of using differently structured sea pay packages, or different combinations of sea pays and SRBs [2, 3, 4]. Reference [5] summarizes these and other studies and gives a detailed description of sea pays and policy changes.

Sea pay has two components. Career Sea Pay (CSP) varies by paygrade and cumulative months of sea duty. The Sea Pay Premium (SPP) is given to Sailors who have served at least 3 years of consecutive sea duty. Different sea pay structures accomplish different goals. Simply put, there are two goals for sea pay: increasing retention of Sailors on sea tours and increasing the amount of time served on sea tours by Sailors who are not leaving the Navy. These goals are not exclusive, but one structure of CSP and SPP will have better retention effects and another will have better tour-lengthening effects.

The retention effects of sea pay are enhanced by targeting a given increase in aggregate sea pay to Sailors who are close to the reenlistment point. Another way to increase sea duty per tour for people who are getting ready to leave their first sea tour would be a graduated SPP that offers incentives to stay that increase as Sailors serve longer. A graduated SPP would be one that starts, for example, at \$200 per month after 3 consecutive years and then increases to \$250 after 4 and to \$300 after 5. It is because the package becomes more attractive each year that it may keep more Sailors on sea duty.

Tour lengthening effects of sea pay are enhanced by shifting payments toward Sailors with more consecutive sea time. The graduated SPP would also provide a good incentive to lengthen sea tours.

To quantify the cost of generating an extra year of sea duty, reference [3] began with the Navy Homebasing Survey of 1996. This survey asked if Sailors would extend sea duty, and for how long, given different combinations of additional income and the promise of homebasing. Using this and EMR data, the analysts constructed measures of how many additional Sailors would extend for various levels of incentive pay. One finding was that over 30 percent of Sailors would extend their sea duty by at least 1 year for a sea pay increase of \$150 per month.

Reference [2] examines a policy that pays \$100 per month in SPP after 3 consecutive years and \$200 after 4 or more. The authors estimate that this policy would cost from about \$12,000 to over \$50,000 per extra year of sea duty. The cost depends on sensitivity of sea duty to sea pay.

In [3], the authors evaluate proposals that include different SPP policies. The different options for SPP range from none, to a straight \$100 per month, to a graduated SPP. They consider scenarios in which \$93 million is spent on different levels of SPP. Graduated SPPs always work the best, and the two best levels generate 9,113 and 9,493 extra man-years of sea duty, meaning costs per man-year of \$9,797 to \$10,205. All of these policies are cost-effective compared with the programming rate of \$59,000.

Since CSP and SPP are paid to all ratings, SRB is sometimes a superior tool. The inability to fill sea billets varies greatly across ratings and NECs. There is commonly a subset of ratings for which extra incentives are required. In this case, paying sea pay to everyone wastes money. In addition, SRBs are targeted at reenlistment points. If the shortage of sea time is restricted to a few ratings and to paygrades that would be achieved just after the first reenlistment point, SRBs would be the best policy. Reference [6] discusses SRBs and other reenlistment policies.

The analysts also consider a combination of policies that includes an SRB, concluding that SRBs are more cost-effective if sea-shore imbalances are confined to a subset of ratings but that SPPs become more effective as the imbalances become more wide-spread. Since current Navy needs are for more sea time in specified sea-intensive ratings, setting high SRBs in these ratings would make sense. Also, policy-makers are evaluating a Differential SRB that would be higher for Sailors reenlisting in sea billets. This is a potentially valuable compensation tool not only because it could be targeted but because so many tours are incomplete due to losses at the reenlistment point.

New policy options

CNA

- Sea Duty Incentive Pay (SDIP)
 - Paid to Sailors who extend sea tours or roll from shore early
 - Can be targeted by rating/NEC and paygrade
 - New pay (2007), so effectiveness has not been quantified
- Differential SRB (D-SRB)
 - SRB targeted to Sailors on sea tours
 - Higher payments if reenlisting to sea
- Assignment Incentive Pay (AIP)
 - Allows Sailors to set their price for taking on a job
 - Potentially provides the least costly incentives
 - A new and not totally proven pay and would have to be adapted to this new use
- Sea Tour Extension Program (STEP)
 - Pays for Sailors in selected ratings or skills to voluntarily extend their sea tours
 - Adds a sea pay with the flexibility to vary by rating

SDIP, which was first introduced in March 2007 and extended to more ratings in June, consists of two incentives and pays up to \$750:

- SDIP-Extension provides an incentive to voluntarily extend sea duty assignments by a minimum of 6 months and a maximum of 24 months either on board the current sea command or by accepting a sea duty assignment at another command.
- SDIP-Curtailment provides Sailors an incentive to voluntarily leave their shore duty assignments a minimum of 6 months early in order to take on a sea duty assignment of at least 12 months.

D-SRB increases the SRB rate for Sailors who reenlist and remain in or enter sea duty.

AIP allows Sailors to set their price, through a "bid" system, for an assignment to selected hard-to-fill jobs. The qualified Sailor submitting the lowest bid receives the assignment. The Navy establishes a maximum payment for type of billet. So far, the Navy has used this pay to fill some overseas billets. The instruction for this pay was written loosely, however, so it can be adapted to many different types of hard-to-fill jobs. The other Services have used AIP in a number of creative ways. It would be feasible to adapt AIP to provide more sea duty. Although this use of AIP may be hard to implement and would have to be tested and evaluated, it has the advantage of being very finely targeted. It can also reduce costs by letting Sailors set their own premiums for extra sea duty and then selecting the Sailors with the lowest premiums.

STEP was an earlier proposal [7]. This pay would induce Sailors in selected ratings or skills to voluntarily extend their sea tours beyond their PRDs. Adding the flexibility to vary pay by rating would increase the Navy's ability to target dollars to ratings that have sea-shore imbalances.

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Conclusions



- Reasons for leaving tours influence completion rates; the percentage of incomplete tours decreases dramatically for tours that end by rolls to shore
- Differences in the percentage of incomplete tours
 - Incomplete tours are always higher for higher PSTs
 - Making equal comparisons, first-term and career completion rates are the same; differences are in the type of loss and percentage of long tours
- Completion rates are an imperfect measure of sea duty per tour; how long a Sailor stays (either before or after completion) is also important
- Differences in sea duty per tour do not always correspond to differences in PSTs
- There is surprisingly little difference in the behavior of Sailors in sea-intensive vs. all-sea ratings
- Although comparisons are limited, Sailors on shore tours have higher completion rates. Of the many who complete their tours, though, most leave the Navy rather than extending or returning to sea
- Using a combination of sea pays and SRBs to encourage voluntary choice is a cost-effective way to get more sea duty per tour

Recommendations

CNA

- Know why tours are not being completed. Policies should be set based on whether incomplete tours are caused by leaving the Navy or rolling early
- Use appropriate combinations of sea pays and SRBs as incentives to increase sea time voluntarily
- Avoid prescribing longer mandatory tours to increase sea time; this does not seem to be effective
- Continue to pursue SDIP so that this promising pay can be tested and evaluated

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Backup

Backup 1: Data description



- Data set of 445,783 tours provides detail by
 - FY tour ended (1994-2006)
 - 36-, 42-, 48-, 54- and 60-month PSTs
 - First term vs. career
 - Reason for terminating tour (EAOS loss, rolling to shore, etc.)
 - Rating
- Time period covered
 - Our earliest tours end in FY94
 - We look at tours ending as recently as FY06 because we cut off extension lengths at 1 year
 - All extensions longer than 1 year have their length truncated (48-month PSTs, for example, have a maximum recorded length of 61+ days)
- Data sources
 - Data on PST by rating and year are from NAVADMINs on Sea-Shore Rotation policies
 - CNA's EMR data used to identify and track sea tours
- We define completion as lasting until 6 months before PST ends
 - Allows leeway for distribution issues and data errors
 - Generous window but departure dates are clustered there
- Shore duty is defined to be type duty codes 1 and 6. Codes 3 and 5 are dropped, and all other duty codes are considered sea duty

We define first term as Zone A and on 1st sea tour. Career is Zone B or higher and on 2nd or 3rd sea tour.

Type duty codes are 1 and 6 for shore and 2 and 4 for sea. Codes 3 and 5 are eliminated.

Due to the size of the data set, we cannot provide detail by type of loss and rating at the same time. We do, however, present results for a subset of sea-intensive ratings and EMCs.

The NAVADMIN Sea-Shore Rotation policies are issued at irregular intervals and assign tour lengths by rating/rate and NEC. The latest revision is NAVADMIN 130/06. In this document, tour lengths were increased in 150 out of 790 categories. Most of the increases were 6 months or less. The average sea tour for E5–E9 Sailors rose from 47 to 51 months. We did not use this new instruction in our data because our latest tours end in FY06 and would have begun at least 3 years before this.

Backup 2: Exclusions



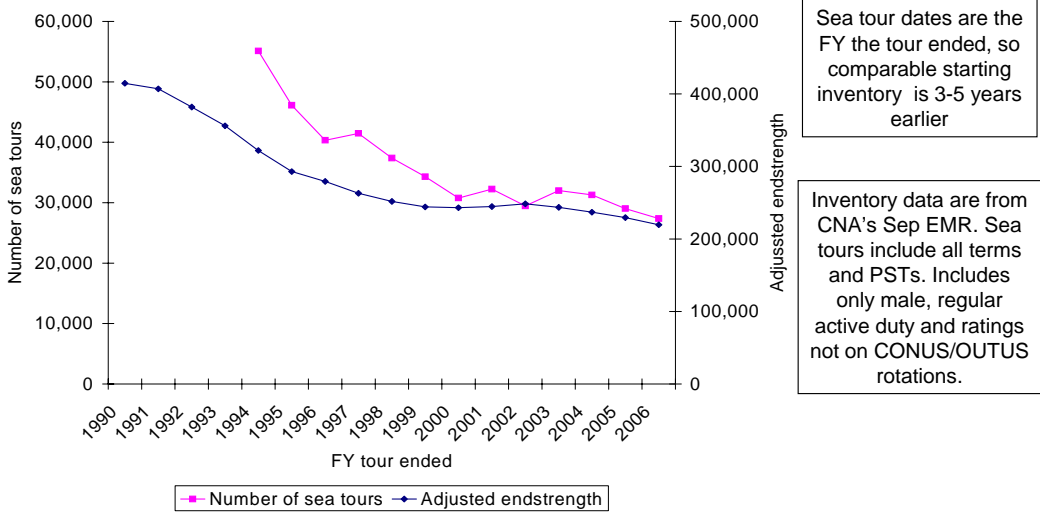
Original sample	613,937		
Exclusion events		Not enough time to complete sea tour	3,010
		Idle time interrupting sea tour	67,269
		Female	72,542
		Other than PSTs 36,42,48,54,60	33,233
		Ratings with CONUS/OUTUS rotations	42,119
		Not first term or career	20,308
		Total exclusion events	<u>238,481</u>
Final sample	<u>445,783</u>		
Dropped observations	168,154		

- Altogether, 27% of the original sample was dropped
- Exclusion events exceed dropped observations because one observation can meet more than one of the exclusion criteria

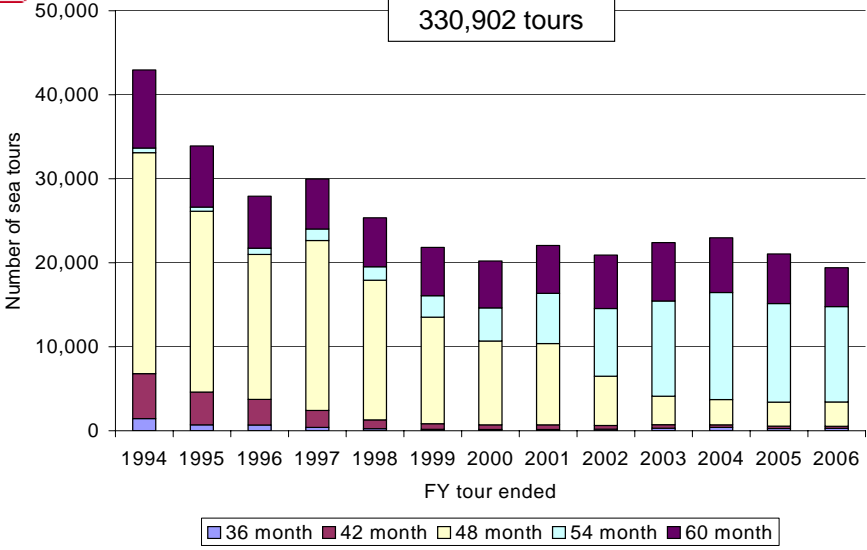
Exclusions are made for tours that don't have enough time to be completed, are interrupted, are served by female Sailors, have unusual PSTs, are in ratings with CONUS/OUTUS rotations, and aren't clearly either first term or career.

- An interrupted tour is one that goes into a status that is not "full duty." This can be Training, Transfer, Prisoner, and Holdee (TTPH) or other non-full-duty codes. We exclude interrupted tours because it is difficult to define and track criteria that would determine whether their return to full duty should be counted as a continuation of the original tour or the beginning of a new tour.
- We exclude female Sailors because there are still many (and even more back with tours ending in FY94) who serve in different types of tours or tours that are structured differently.
- For different times and ratings, there are a sizable number of entries in the Navy's rotation instructions with PSTs of 24, 33, 39, 40, 43-45, 50, 51, and 57. Although the number of observations in all these PSTs adds up to 33,233, the maximum number in any one PST is too low to allow any meaningful analysis. The highest numbers are around 15,000 for PST 45 and 13,000 for PST 51.
- We exclude ratings that have CONUS/OUTUS rotations because tour lengths and the type of duty on the two tours differ from standard sea and shore duty ratings. The ratings we include in this category are CTA, CTI, CTM, CTO, CTR, CTT, DM, DT, HM, JO, LN, MU, PC, MN, OTA, OTM, and OT.
- We define first term as tours that are in Zone A and are on their 1st tour. Career is Zone B and on 2nd or 3rd tour. We exclude observations that don't fall into either of these categories (e.g., one that is in Zone A and on the 2nd or higher tour).

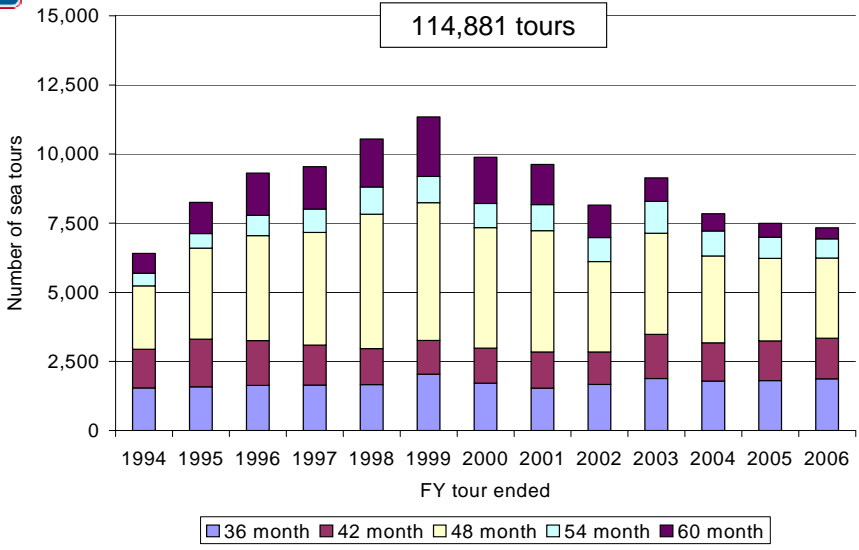
Backup 3: Decline in tours corresponds to decline in endstrength



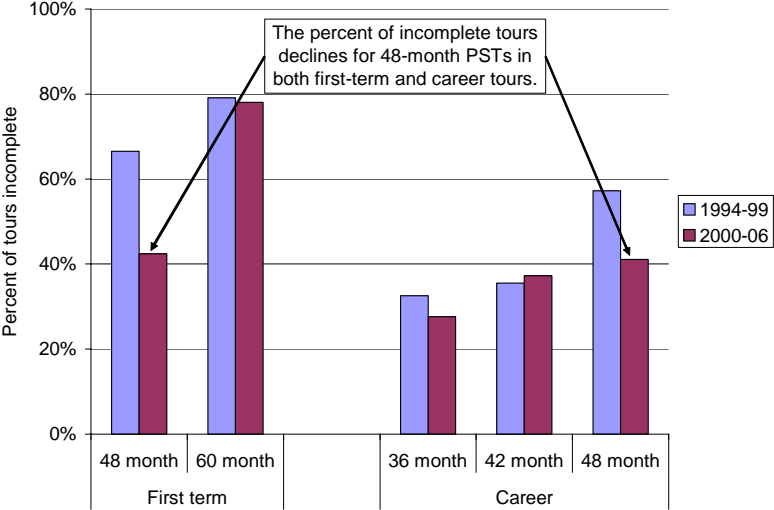
Backup 4: First-term sea tours by PST and year



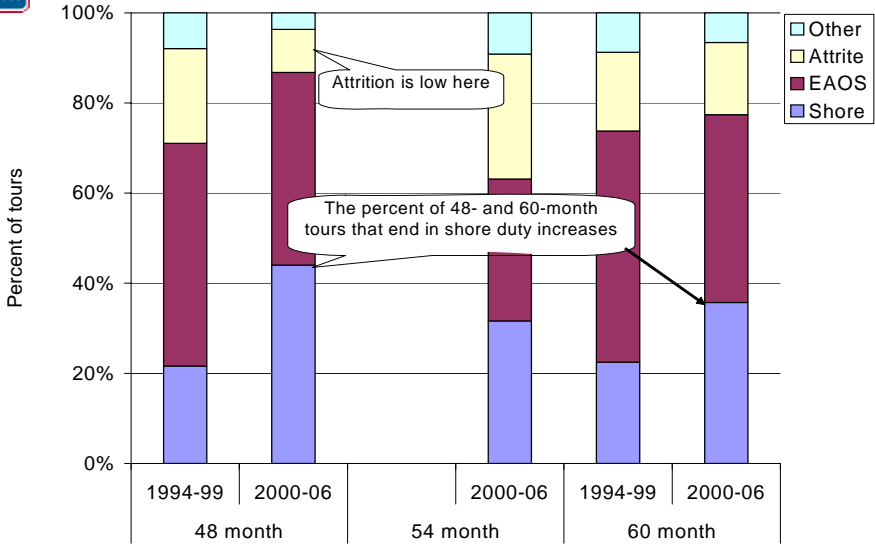
Backup 5: Career sea tours by PST and year



Backup 6: Unadjusted sea tour completion by year group

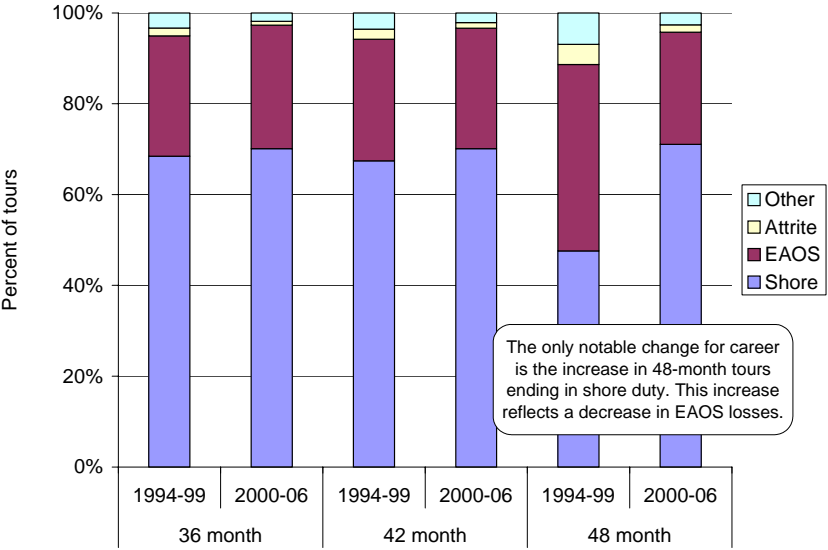


Backup 7: Loss types for first-term tours: changes by year groups



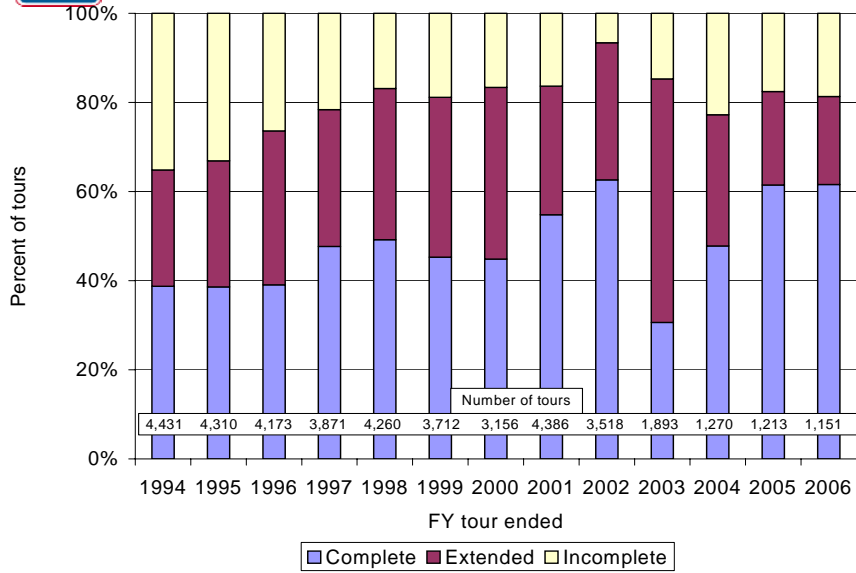
The only notable change for career is the increase in 48-month tours ending in shore duty. This increase reflects a decrease in EAOS losses.

Backup 8: Loss types for career tours: changes by year groups

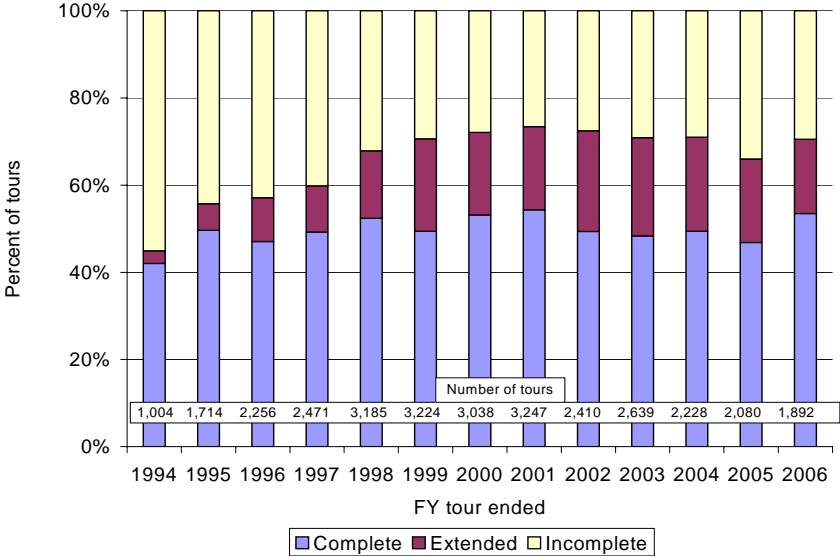


This is all outcomes from raw data (complete, extended, and incomplete).

Backup 9: Changes over time for first-term 48-month PST tours



Backup 10: Changes over time for career 48-month PST tours



Backup 11: Breakdown of 48- and 60-month first-term tour lengths



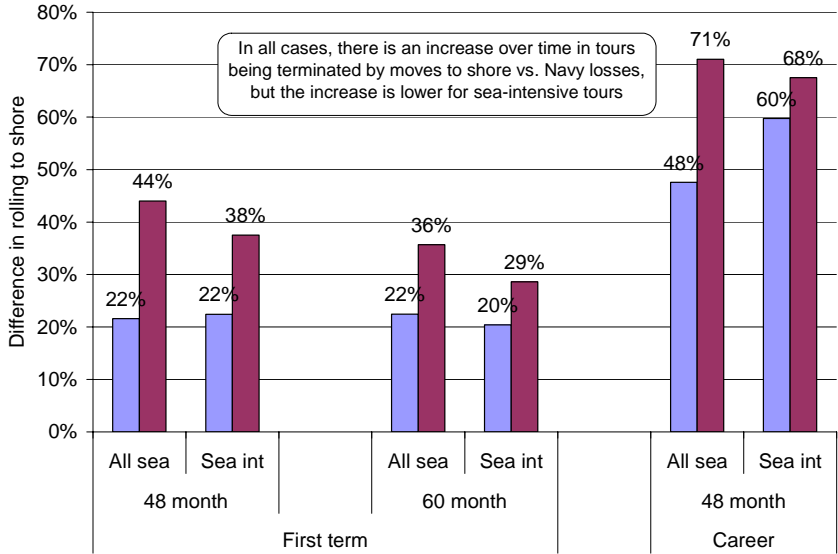
		2000-06 data				
		PST	Incomplete	Complete	Extended	Total
Distribution of outcomes	48-month		15%	52%	33%	100%
	60-month		52%	37%	11%	100%
	Delta		37%	-16%	-22%	0%
Average months per tour	48-month		33.2	48.3	58.8	49.5
	60-month		42.0	58.8	71.2	51.4
	Delta		8.8	10.5	12.5	1.9
Fraction of total months	48-month		4.9	25.2	19.3	49.5
	60-month		22.0	21.5	7.9	51.4
	Delta		17.1	-3.8	-11.4	1.9

- Time served on 48- and 60-month tours is greatly influenced by differences in outcomes
 - 60-month PST has 37 percentage points more incomplete tours
 - Many 48-month tours are extended
- Third row shows fraction of average tour length from each outcome: longer average time on 48-month tours comes from more completions and extensions

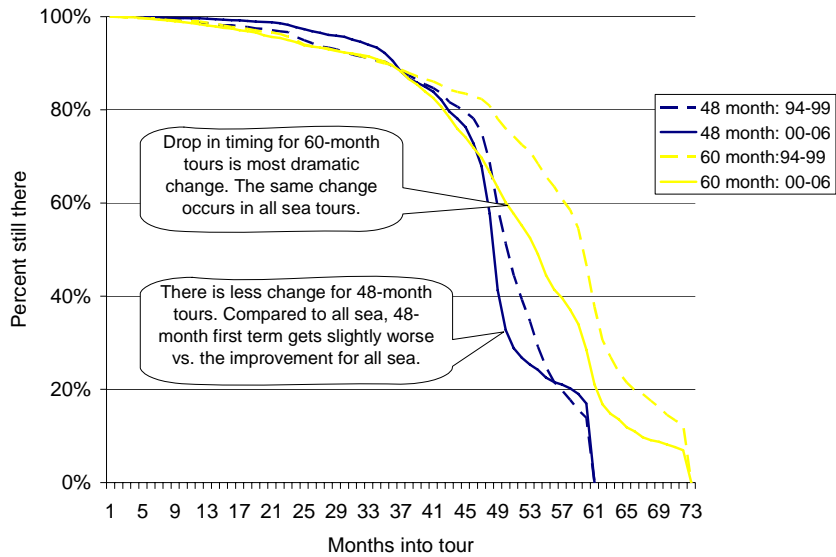
Taking an average of the time that each Sailor spends on his or her tour, Sailors with 48-month PSTs serve 49.5 months and those with 60-month PSTs serve 51.4 months. The average months per tour differs by only 1.9, while the difference in PSTs is 12 months. The average actual months per tour is determined by two factors: how many tours are incomplete, complete, or extended; and the average number of days served in each of these outcomes. That is, if there is a high percentage of incompletes, average months will be lower because the number of months served for each incomplete tour is less than the months for complete or extended tours. Also, if one PST has a lower number of average months served per incomplete tour, the average months will be lower (holding the distributions of outcomes constant).

In this case, a difference in months on incomplete tours cannot be contributing to the difference in tour lengths. Although Sailors who don't complete 60-month tours serve about 9 months more than those on 48-month tours, the days served relative to the tour length is almost identical at 69 and 70 percent. When the distribution of outcomes and the average months in each outcome are combined, we can see the influence of Sailors leaving earlier in their tour. The third column shows how much of the total average tour length comes from each outcome. The lengthening of the 48-month tours results not from the average months spent on complete or extended tours, but from more Sailors serving long enough to get into these categories.

Backup 12: Loss types over time for all-sea vs. sea-intensive tours



Backup 13: Timing of losses: Differences by time period for sea-intensive tours

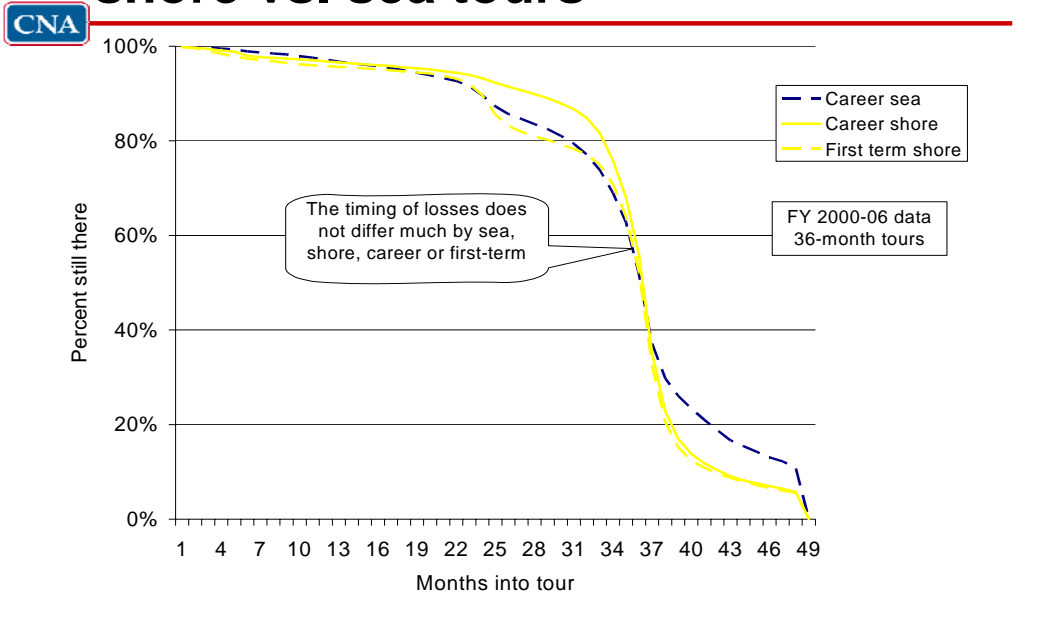


Comparing the time-period differences between sea-intensive and all sea tours, the difference over time for 60-month tours is virtually identical. That is, timing becomes much worse in the more recent period and this difference begins fairly late in the tour (after 36 months).

While timing for 48-month tours is better in the more recent period in all sea tours, however, the same improvement is not seen in sea-intensive tours.

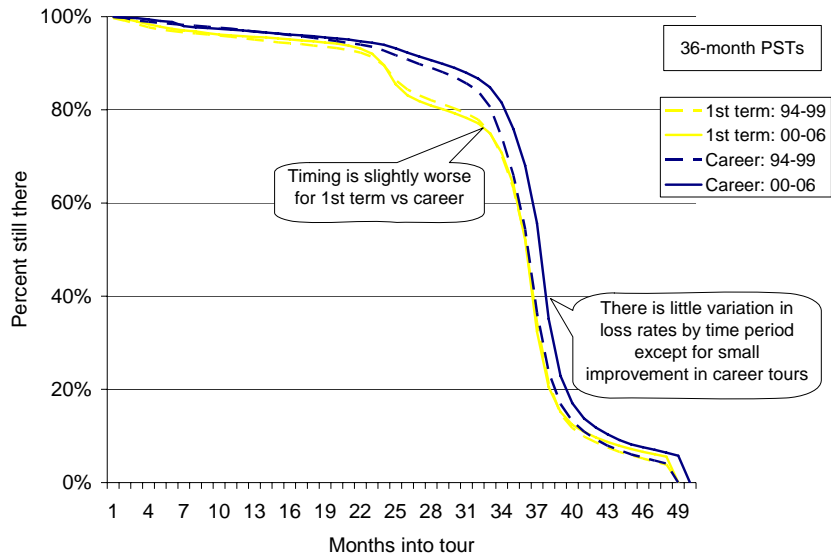
We have omitted career tours because the timing of losses is virtually identical for the two time periods.

Backup 14: Timing of losses for shore vs. sea tours



The timing of losses for 36-month tours does not differ much by sea, shore, career, or first term. The only difference is slightly better timing for career shore tours.

Backup 15: Timing of losses: Differences by time period for shore tours



References

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- [2] Henry S. Griffis and Heidi L. W. Golding. *Sea Pay Premium for Navy Enlisted Personnel*, Jul 1997 (CNA Annotated Briefing 97-63)
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- [4] Henry S. Griffis and Heidi L. W. Golding. *Outsourcing Initiatives, Tour Lengths and a Sea Pay Premium*, Jul 1998 (CNA Annotated Briefing 97-109)
- [5] Michael L. Hansen and Martha E. Koopman. *Military Compensation Reform in the Department of the Navy*, Dec 2006 (CNA Research Memorandum D0012889.A2)
- [6] Martha E. Koopman. *Improving Reenlistment Incentives and Processes*, Jan 2007 (CNA Research Memorandum D0015254.A2)
- [7] Heidi L. W. Golding and Henry S. Griffis. *Analysis of Proposed Sea Tour Extension Program*, Jan 1999 (CNA Annotated Briefing 98-129)

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