NAVAL POSTGRADUATE SCHOOL
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THESIS

COST EFFECTIVENESS ANALYSIS OF THE "SEA TO SWOS" TRAINING INITIATIVE ON THE SURFACE WARFARE OFFICER QUALIFICATION PROCESS

by

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December 2002

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13. ABSTRACT

The number of Surface Warfare Officers (111Xs) in a wardroom directly affects the combat readiness and effectiveness of a warship today. Preliminary research indicates that the "Sea to SWOS" training initiative is seen to have a positive effect on the amount of time it takes an 116X to attain the 111X designation. The initial qualitative analysis highlights a perceived increase in retention and readiness (combat effectiveness) while the quantitative analysis shows additional costs to the Navy Personnel Command and savings in training costs for the Naval Education and Training Command and OPNAV N76, the Surface Warfare Resource Sponsor.

This thesis examines the cost-effectiveness of the newly established "Sea to SWOS" training transformation on the Surface Warfare Officer qualification process. This initiative leverages shipboard on-the-job training experiences and interactive computer-based training replacing previously formalized classroom training. As a result, this initiative significantly alters the Division Officer Sequencing Plan (DOSP). Based on the qualitative data, the transformation to the DOSP in the Surface Warfare Officer qualification process will most likely have a positive effect on retention and the utilization of fully qualified 111X Division Officer resources through earlier numbers of 111X attainment and increased officer personnel readiness.

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TABLE OF CONTENTS

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LIST OF FIGURES

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LIST OF TABLES

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LIST OF ACRONYMS

111X	Unrestricted Line Officer Qualified Surface Warfare
116X	Unrestricted Line Officer in Training for Surface Warfare Qualification
BOLTC	Basic Officer Leadership Training Course
BST	Billet Specialty Training
CBT	Computer Based Training
CDO	Command Duty Officer
CRUDES	Cruiser/Destroyer Community
DOD	Department of Defense
DON	Department of the Navy
DOSP	Division Officer Sequencing Plan
DTIC	Defense Technical Information Center
EOOW	Engineering Officer of the Watch
FCA	Fleet Concentration Area
FY	Fiscal Year
FYDP	Future Years Defense Program
IDTC	Interdeployment Training Cycle
LDO	Limited Duty Officer
MPN	Military Personnel, Navy
NETPDTC	Naval Education and Training Professional Development and Technology Center
NSS	Navigation Seamanship and Shiphandling
OMN	Operations and Maintenance, Navy
OJT	On-The-Job Training
OOD	Officer of the Deck
OPTEMPO	Operational Tempo
PCS	Permanent Change of Station
POC	Privately Owned Conveyance
PQS	Personnel Qualification Standards
ROI	Return on Investment
SWO	Surface Warfare Officer
SWOCP	Surface Warfare Officer Continuation Pay
SWOS	Surface Warfare Officer School
SWOSCOLCOM	Surface Warfare Officer School Command
SWOSDOC	Surface Warfare Officer Division Officer Course
TAO	Tactical Action Officer
TDY	Temporary Duty
T-SWOS	Tailored Surface Warfare Officer School
URL	Unrestricted Line
YCS	Years Commissioned Service
YG	Year Group

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I. INTRODUCTION

A. BACKGROUND

1. The "Sea to SWOS" Training Initiative

Despite recent strides by Surface Warfare Officer (SWO) leadership to improve SWO retention, the Navy continues to lose the retention battle for the SWO community. In response to these negative trends, SWO leadership has decided to institute major changes to the initial SWO training and qualification process through the "Sea to Surface Warfare Officer School (SWOS)" training initiative. The primary transformation objective is to decrease the time it takes junior officers to qualify as Surface Warfare Officers, thus increasing the amount of time onboard their first ships as qualified 111Xs. Commanding Officers get qualified Surface Warfare Officers sooner and have them onboard longer to utilize their skills. The changes also address an ongoing effort to improve junior officer retention. Senior SWO leadership believes that "this transformation will be more engaging, motivating, and worthwhile for the community and newly qualified officers" [Ref. 1].

According to a 2001 survey of 2,113 junior Surface Warfare Officers, only 24 percent of those surveyed (less than one in four) felt that the Surface Warfare Officer School Command (SWOSCOLCOM) prepared them or very well prepared them as officers for their first at-sea division officer tour. Fifty-two percent of those surveyed felt that SWOSCOLCOM merely did a satisfactory job of preparing them for their first at-sea division officer tour, while 19 percent felt that SWOSCOLCOM poorly prepared them [Ref. 2]. The "Sea to SWOS" training initiative dramatically cuts down the amount of formal, schoolhouse training new accessions receive.

New accessions will report directly to their first ships instead of reporting to the Surface Warfare Officer School Division Officer Course (SWOSDOC), where they would have participated in mostly academic-oriented schoolhouse training. The shipboard environment will serve to replace the initial classroom-training environment. This will ensure that all new officers receive current, accurate, and practical training pertinent to their ship. After junior SWOs earn their Officer of the Deck (Underway)

qualification, they would report for temporary duty (TDY) to SWOS for three to five weeks for finishing school and leveling training. Upon their return from Newport, RI, junior SWOS should earn their SWO pins in 1-2 months.

2. 2001 Junior Surface Warfare Officer Survey Results

The 2001 survey of 2,113 junior Surface Warfare Officers also revealed that 32 percent of the respondents planned to leave the United States Navy after completing their minimum service obligation. However, barely 33 percent of those surveyed intended to remain in the SWO community [Ref. 3]. From this figure, it can be discerned that 35 percent of junior officers questioned planned to apply for lateral transfer to change their designator. More than half of the junior Surface Warfare Officers surveyed who expressed a desire to stay in the Navy found other officer communities more appealing than Surface Warfare [35 percent planning to lateral transfer / 68 percent of those surveyed planning to stay in the Navy past their minimum service obligation]. In addition, only 43 percent of all 2001 junior SWO respondents wanted to become Commanding Officers of ships, a percentage unchanged from 1999.

According to the Surface Warfare Officer Community Manager, the current inventory of SWO Lieutenants is 2,086, 248 more officers than the 1,838 SWO Lieutenants billets required. However, 130-180 officers lateral transfer to other officer communities each year. In addition, the 1,838 officers include 111Xs that have not reached their minimum service obligation. The 305-officer shortage in SWO Lieutenant Commanders (1,061 officers to fill 1,366 billets) more clearly illustrates the magnitude of the junior officer retention problem [Ref. 4].

The 2001 survey also showed that 38 percent of junior Surface Warfare Officers who planned to leave active duty made their decision during their first at-sea division officer tour, as compared to 24 percent from the 1999 survey, an increase of 14 percent [Ref. 5]. The primary focus of a junior SWO during his first at-sea division officer tour is to qualify as a Surface Warfare Officer. This qualification is the first step in a long training and qualification process in attaining Command at Sea. If the qualification process for junior Surface Warfare Officers improved, more officers might stay in the Surface Warfare community. Enhancements to the qualification process should provide

more satisfying division officer experiences, thus positively influencing the personal decisions of Surface Warfare Officers to stay in the community. This could lead to increased retention, which would provide more candidates for Command at Sea.

3. Surface Warfare Officer School Command Study

The Surface Warfare Officer School Command (SWOSCOLCOM) conducted a study of Year Group (YG) 1998 and found that it took them an average of just over 17 months to qualify as Surface Warfare Officers, after completing the Surface Warfare Officer School Division Officer Course (SWOSDOC) and Billet Specialty Training (BST) to attain the 111X designator. On average, YG 1998 first-tour division officers earned their SWO pins 26 months after commissioning [Ref. 6]. Division officers normally serve 24-months on their first sea tour. These junior officers on average only remain for seven months before detaching enroute to their second at-sea division officer tour. This leaves little flexibility for Commanding Officers or newly qualified officers to utilize their knowledge, skills, and abilities to pursue other advanced watchstanding qualifications or develop leadership opportunities.

4. Surface Warfare Officer Community Concerns

However, the "Sea to SWOS" training transformation is not without controversy, as evidenced by numerous discussions on SWONET, the Surface Warfare Officer community website. There are concerns about the lack of formal training received by newly commissioned officers when arriving at their first ship. The perception is that the ships' Commanding Officers will bear the burden of training junior Surface Warfare Officers from scratch. The quality of unproven SWO Computer Based Training (CBT) and lack of formal classroom instruction were other apprehensions voiced. The first cohort of Ensigns to participate in the "Sea to SWOS" initiative will use CBT technology that has not been vigorously field-tested. Increased workload to the ship and loss of leadership while officers are on temporary duty (TDY) for three to five weeks of training at Newport, RI, for finishing and leveling school training is another concern.

The execution of the "Sea to SWOS" transformation will require a major change in previous mindsets. Previously, when officers reported onboard after completing SWOSDOC, the officers and crew expected them to have baseline knowledge on various

Surface Warfare fundamentals and systems, ranging from divisional administration to weapons and engineering. However, under the "Sea to SWOS" transformation, newly reporting officers will only have knowledge obtained from midshipman academics and summer training. Afloat leadership must accept that these officers will take longer to adapt to their new environment. The lack of upfront training will affect their ability to immediately contribute to mission readiness. Perhaps this change will restore some of the Chief Petty Officer leadership, which has migrated to newly arriving officers over the past decades.

Successful implementation of the "Sea to SWOS" transformation could dramatically affect the Surface Warfare community and the United States Navy. A well-executed training initiative could leverage CBT and the shipboard environment to deliver training to the waterfront. The ramifications of "Sea to SWOS" could leave an indelible mark on the way the naval service delivers formalized training to the fleet.

B. RESEARCH QUESTIONS

1. What are the long-term costs and savings associated with the "Sea to SWOS" training initiative on the Surface Warfare Officer qualification process?

2. What improvements to the "Sea to SWOS" training initiative should be made to lower the overall costs and increase the overall benefits of training junior Surface Warfare Officers?

3. What potential impact will the "Sea to SWOS'" transformation have on retention in the Surface Warfare Officer community?

C. SCOPE, LIMITATIONS, AND ASSUMPTIONS

The scope will include: (1) reviewing the 2001 Junior Surface Warfare Officer Survey and SWOSCOLCOM study, (2) a description of the impact of the "Sea to SWOS" transformation on the Surface Warfare Officer training pipeline, (3) an analysis of the long-term costs and savings of this training initiative, and (4) a discussion of the potential impact of the "Sea to SWOS" transformation on retention. This thesis concludes by evaluating the overall costs and benefits of training junior Surface Warfare Officers.

The "Sea to SWOS" initial cohort starts in December of 2002, so an evaluation of officers completing the process is not currently available. Statistical data on junior SWO retention will be unknown for several years. This thesis also limits discussion of retention issues to those affiliated with the junior Surface Warfare Officer community, which will limit the discussion of retention issues to those associated with the initiative. Costs and benefits associated with other qualifications earned by junior SWOs, such as Command Duty Officer (CDO), Engineering Officer of the Watch (EOOW) and Tactical Action Officer (TAO), though briefly discussed, are beyond the scope of this thesis. Limited Duty Officers (LDOs) seeking SWO qualification, though impacted by the "Sea to SWOS" training initiative, are not included in this study because SWO qualification, though beneficial for their careers, is not mandatory.

This thesis assumes readers are conversant with the conventional Surface Warfare Officer pipeline and associated milestones from commissioning to Command at Sea. This thesis also assumes that completing shipboard Computer Based Training (CBT) adequately satisfies the 100 level (Fundamentals) and 200 level (Systems) items associated with the SWO Personnel Qualification Standards (PQS) book leaving 300 level (Watchstations) PQS line items for an 116X to complete under the discretion of afloat Commanding Officers. Previously, completing SWOSDOC was an acceptable substitute to fulfilling the majority of these line items. This thesis assumes that the SWO PQS book will not change significantly in the near future.

D. LITERATURE REVIEW AND METHODOLOGY

The results from the 2001 Surface Warfare Officer Junior Officer Survey and the most recent Officer Readiness and Retention Briefs were utilized to obtain junior SWO retention information. Guidance provided by senior SWO community leadership through articles on SWONET, naval messages and instructions, and interviews of key personnel charged with implementing the "Sea to SWOS" training initiative were used to develop background and make assumptions regarding impacts on junior SWO retention.

The long terms costs and savings incurred by the "Sea to SWOS" transformation were evaluated using cost data obtained from the Naval Education and Training Professional Development and Technology Center (NETPDTC), the Defense Technical

Information Center (DTIC), and the Department of the Navy, Budget Resources Directory.

E. DEFINITIONS AND ASSUMPTIONS

This thesis defines 116Xs as unrestricted line (URL) officers that are in training for Surface Warfare qualification and 111Xs as URL line officers that are Surface Warfare qualified [Ref. 7].

All 116Xs will be required to attend Tailored Surface Warfare Officer School (T-SWOS) before qualifying as an 111X, with no exceptions. They will also complete the two-week long Basic Officer Leadership Training Course (BOLTC) and variable length, job-specific Billet Specialty Training (BST), in Fleet Concentration Areas (FCAs) on their initial sea tours, instead of SWOS, Newport, RI, before being sent on TDY to T-SWOS. New accessions typically attended BOLTC as part of SWOSDOC and BST after the completion of SWOSDOC, but before reporting aboard their first ship. The costs incurred by attending BOLTC and BST in FCAs will be equivalent in cost and quality to the BOLTC and BST taught in Newport, RI. The SWO leadership's decision to suspend BST training in Newport and use cost savings to relocate courses to FCAs or develop an interactive course to replace BST supports the cost assumption.

F. ORGANIZATION OF STUDY

Chapter II explains the literature reviewed and theoretical framework surrounding the Surface Warfare Officer community and the possible impacts of the "Sea to SWOS" training initiative on the Division Officer Sequencing Plan. Chapter III describes the methods used to gather data involved in developing costs and benefits of the "Sea to SWOS" transformation. Chapter IV organizes and presents the financial and retention data collected for this thesis. Chapter V analyzes and interprets the information concerning cost savings, costs incurred, potential impact on retention, and return on investment. Chapter VI summarizes Chapters I-V in the form of conclusions, offers recommendations for further study, and makes suggestions for improving the "Sea to SWOS" training initiative.

G. OBJECTIVES

This thesis will determine the long-term costs and savings of the "Sea to SWOS" training initiative for the Surface Warfare Officer Qualification process. This thesis will also address the potential benefits of junior officer retention in the Surface Warfare Officer community.

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II. LITERATURE REVIEW & THEORETICAL FRAMEWORK

A. SURFACE WARFARE TRAINING STRATEGY

1. Training

The Surface Warfare Training Strategy provides long-term governing guidance for Surface Warfare training through the year 2010 and beyond. It explicitly states, "the Navy can build a more tailored core/strand/specialty training track which will have the net effect of more efficient use of resources (time, dollars, and training space) and better graduates" [Ref. 8]. Advances in CBT technologies will enhance On-the-Job training (OJT), and ensure junior Surface Warfare Officers develop and retain skills that rapidly deteriorate if not routinely exercised. The "Sea to SWOS" training initiative will leverage CBT and the shipboard environment to help junior officers learn shipboard fundamentals and systems once taught in a schoolhouse setting at SWOSDOC.

2. "Sea to SWOS" Performance Metrics

The primary stakeholders in the Surface Warfare Officer qualification process, the Director of Surface Warfare and the two Naval Surface Force Type Commanders, identified two training attributes as their primary measures of effectiveness for training 111Xs; reduce time to attain qualification while increasing the time onboard their first ships as qualified Surface Warfare Officers. These two measures of effectiveness were the primary factors in deciding to transform the qualification process [Refs. 9, 10, and 11]. However, cost was not a principal factor in the decision to implement the "Sea to SWOS" training initiative. Not using dollar cost contradicts the Surface Warfare Training Strategy, which states, "The Navy must obtain the maximum benefit from the limited resources (both dollars and people) available now and in the future" [Ref. 12]. In an era of constrained resources, the "Sea to SWOS" training initiative must get maximum value for the amount invested in the transformation. The SWO leadership goal is to minimize costs and maximize retention of junior officers.

B. DIVISION OFFICER SEQUENCING PLAN

1. SWOSDOC and BST

SWOs generally follow a standard career path from commissioning through Command at Sea. Previously, 116X accessions have reported to SWOSCOLCOM in Newport, RI, upon commissioning to attend SWOSDOC. SWOSDOC provided the tools needed for a successful first division officer tour. SWOSDOC consisted of two core phases. Core Phase I, common for all SWOSDOC students, consisted of eleven weeks of shipboard management, ship control, and combat systems fundamentals. During the final two weeks of Core Phase I, 116Xs attended the two week long Basic Officer Leadership Training Course (BOLTC). Core Phase II, six weeks long, focused on platform specific engineering training.

Upon completing SWOSDOC, students attended Billet Specialty Training (BST) designed to prepare the officers for their first shipboard assignment. BST length depended on the course attended and could range from three to six weeks, depending on their assigned billet [Ref. 13]. SWOSDOC students could spend anywhere from 22-25 weeks at SWOSCOLCOM.

2. Shipboard PQS

Once 116Xs report aboard their first ship, their primary focus should be on completing the SWO Personnel Qualification Standards (PQS) watchstations leading to the 111X Surface Warfare Officer designation. PQS completion meant than an officer satisfied a minimum level of competency required to perform specific duties. 116Xs had to complete these line items applicable to their own ship's capabilities and mission areas within 18 months of reporting onboard. Commanding Officers at sea could grant extensions up to six-months beyond the 18-month time window if events in the ship's schedule precluding an 116X from completing PQS line items [Ref. 14]. After granting an extension, Commanding Officers had to send a letter to the Chief of Naval Personnel explaining qualification delays.

The SWO PQS consists of three series and multiple qualifications. Completing SWOSDOC fulfilled the 100 and 200 series requirements, Fundamentals and Systems, through a series of classroom lectures, practical labs, and examinations. The 300 level

series, Watchstations, includes the line items that must be successfully demonstrated onboard the ship for SWO qualification.

116Xs must complete Basic Damage Control, SWO Engineering (not the same as EOOW), Small Boat Officer, Officer of the Deck (In-Port), Combat Information Center Watch Officer, and Officer of the Deck (Underway) qualifications to complete the SWO PQS. After completing PQS, an 116X must successfully pass an oral board, headed by their Commanding Officer. In the oral board, the 116X must successfully display a general knowledge of all aspects of surface warfare covered by the SWO PQS. Upon the Commanding Officer's approval, an 116X becomes an 111X and earns his gold Surface Warfare Officer pin after successfully passing their oral board. The Bureau of Naval Personnel also recognizes this achievement by sending a congratulatory letter (Appendix A) and noting the qualification in their officer master file.

3. Tour Lengths

After completing SWOSDOC and BST, typical 116Xs serve for 24 months on their first ship in a first-tour division officer billet. During this first tour, junior SWOs earn their SWO designators within 18 months and subsequently pursue other advanced qualifications that are career milestones, such as Engineering Officer of the Watch (EOOW), Tactical Action Officer (TAO), or Command Duty Officer (CDO) as time and the commanding officer's policy permit.

Afterwards, Division Officers serving in the Cruiser/Destroyer Community (CRUDES) or amphibious ships for their first tours transfer to other cruisers, destroyers, or amphibious ships, or serve on patrol craft, minesweepers, assault craft units, special boat units, or logistics ships. Officers serving on non-CRUDES and non-amphibious ships for their first tour had to serve their second tours on a CRUDES or amphibious platforms. SWOs normally served for 18 months during their second at-sea division officer tours. These officers continued to pursue other advanced qualifications and received greater responsibility once they qualified SWO. "This plan will ensure the broadest possible experience for all officers" [Ref. 15]. The current Division Officer Sequencing Plan (DOSP) has been in effect since 1995.

4. Recent Division Officer Sequencing Plan Enhancements

In January 2002, senior SWO leadership enhanced the DOSP by adding three options in addition to the standard 24-month/18-month rotation. These options may be offered by the ship's Commanding Officer to non-nuclear trained, SWO qualified, first tour division officers.

The first option allows an officer to "fleet-up" to a second-tour division officer billet onboard their first ship. The assignment, available to one or two people per ship, would involve 36 months of total sea time as a division officer, in contrast to the standard DOSP that called for 42 months of total sea time (24 months for first tour, 18 months for second tour).

The second option is oriented towards the career-oriented SWO. Surface Warfare Officers would extend for six months on their first ship, leading to a total of 30 months of sea time as a division officer. Afterwards, they would have the option to transfer to shore duty or immediately start Department Head training. This option would generally be offered to officers who are off to a fast start. It awards officers who qualify early as SWOs and subsequently, after qualifying in other career milestones like EOOW or TAO, rewards "hot runners" by putting them on a fast track to increased further responsibility.

The third option transfers officers at the 18-month point of their first division officer tour. After several months of advanced combat systems training, they would serve a 24-month tour on an AEGIS cruiser or destroyer as a Fire Control Officer or Combat Information Center Officer. Total sea time as a division officer would not change. Training requirements for the AEGIS combat system drove this option.

Vice Admiral Timothy LaFleur, Commander, Naval Surface Forces, U.S. Pacific Fleet said, "Both Commanding Officers and Junior SWOs indicated to the Surface Community leadership they wanted more options" [Ref. 16]. The three options helped the Navy fill future Department Head billets and increased wardroom continuity. These options also had the added benefit of improving morale by giving SWOs greater control over their own destiny.

C. SEA TO SWOS TRAINING INITIATIVE

1. Future Changes to the Division Officer Sequencing Plan

Under the proposed "Sea to SWOS" training initiative, newly commissioned officers, instead of reporting to SWOSDOC in Newport, for formal, schoolhouse training, will report directly to their first ships for a variable period ranging from six to fifteen months. After junior officers earn their underway Officer of the Deck (OOD) letters, a significant milestone in the SWO qualification process, they will be sent on TDY to Tailored SWOS (T-SWOS) for "finishing" school and "leveling" instruction, lasting from three to five weeks. After completing T-SWOS, junior officers will return to their ships where they will complete their Surface Warfare Officer qualification in 1-2 months. First tour lengths will increase to 27 months to account for the time away at T-SWOS in Newport, RI.

2. SEA to SWOS Training Triad

While onboard, junior Surface Warfare Officers will complete a training triad of Personnel Qualification Standards (PQS), Computer Based Training (CBT), and On-the-Job Training (OJT). 116Xs will be able to proceed through CBT curriculum lessons fashioned after the training units taught at SWOSDOC and PQS at their own pace and sequence, an option that was not feasible at SWOSDOC. 116Xs can capitalize on their shipboard experience through OJT to actively practice what they learn. Senior Watch Officers will monitor individual performance via CBT module tests taken aboard the ship and monthly PQS completion progress. A pre-SWOS exam will be administered upon completing the CBT based lessons. That exam will provide feedback to the officer, ship, and SWOS, and give input into the type and level of training the 116X will receive at T-SWOS [Ref. 17].

3. T-SWOS as a Finishing and Leveling School

While at T-SWOS, junior officers will receive tailored Navigation Seamanship and Shiphandling (NSS) instruction. They will also obtain training in combat systems, engineering, and other aspects of Surface Warfare. This training provides instruction to officers whose operational experience aboard some platforms might have been less opportunistic (i.e. Minesweepers vs. AEGIS platforms, ship's in dry dock vs. underway

time) [Ref. 18]. T-SWOS will serve to level the playing field between officers on different types of ships and standardize knowledge in the SWO qualification process.

4. Beneficial Outcomes

According to the leadership of the Surface Warfare community, "the payoff for both ship and officer is more time onboard as a Surface Warfare qualified officer" [Ref. 19]. "Hot-running" 116Xs could qualify as 111Xs in less than 8 months from commissioning (6 months to complete CBT and earn OOD letter + 3 weeks at T-SWOS + 1 month on the ship after returning from T-SWOS) with 19 months remaining onboard. This will provide greater flexibility to the command to train the junior officer in more advanced watch stations. Junior officers could spend time qualifying for Tactical Action Officer or Engineering Officer of the Watch, significant Surface Warfare qualification milestones. Commands, particularly on AEGIS class platforms, could assign qualified junior SWOs to train in critical, advanced ship class specific watch stations, like Surface/Subsurface or Air Warfare Coordinator.

The "Sea to SWOS" initiative will shorten the qualification process for Surface Warfare Officers dramatically and is a fundamental shift in Surface Warfare Training. Instead of focusing on investing in academic-oriented brick and mortar facilities, the community would focus on investing in CBT technologies. The long-term result of the "Sea to SWOS" initiative for Commanding Officers at-sea is increased flexibility in the utilization of qualified first-tour division officers. In addition, division officers qualified under this initiative benefit from increased opportunities to develop tactical and leadership skills. Finally, when first-tour division officers transfer to their second division officer tour, the Commanding Officers of those ships reap the rewards of a more experienced SWO.

D. SURFACE WARFARE OFFICER CONTINUATION PAY

Officers in the Surface Warfare community have started to receive Surface Warfare Officer Continuation Pay (SWOCP). SWOCP, initiated by the FY 2000 Department of Defense Authorization Act, pays up to $50,000 to a Surface Warfare Officer to stay in the SWO community and fulfill afloat department head requirements

[Ref. 20]. 111Xs may apply for the SWOCP when: 1) they screen for Department Head and, 2) are within 18 months of completing their minimum service requirement.

According to the Surface Warfare Officer Community Manager, "The SWOCP has the greatest potential to make a large and immediate impact" [Ref. 21]. Intuitively, the implementation of the bonus should help boost officer retention considerably. However, according to the 2001 SWO Junior Officer Survey, 60 percent of those surveyed indicated that the SWOCP was an insufficient motivator to stay on active service [Ref. 22]. This suggests that senior SWO leadership must continue to "take a round turn" on SWO culture and make other aspects of being a SWO more attractive.

E. BENEFITS OF THE STUDY

This research will provide a comprehensive overview of the long terms costs and savings associated with the "SEA to SWOS" training initiative. It will provide unique insight on what changes to the Surface Warfare qualification process would reduce costs and maximize benefits. A preliminary discussion concerning the impact of "SEA to SWOS" on retention should generate interest for further evaluation.

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III. METHODOLOGY

A. OVERVIEW

This chapter will describe the methodology used to gather data involved in developing costs and benefits of the "Sea to SWOS" transformation. This thesis compares the cost to train one 116X under the current DOSP against the costs to train an 116X under the "Sea to SWOS" initiative. The financial advantages and disadvantages of the current DOSP and "Sea to SWOS" training pipeline will stand out.

The following equation describes the qualification pipeline for 111Xs based on the current DOSP and will aid in explaining costs.

$$(1)\ 111X_1 = PCS_1 + SWOSDOC + BST_1 + PCS_2 + POST\text{-}SWOS$$

The costs associated with training a SWO under the current DOSP, "$111X_1$," are subdivided into several parts. $PCS_{1,\ 2}$ are the costs of the two associated Permanent Change of Station moves associated with the current DOSP. The first PCS move occurred from the 116X's commissioning source, either at the United States Naval Academy, Naval Reserve Officer Training Corps units, or Officer Candidate School to SWOSDOC in Newport, RI. The second PCS move transpires upon completing SWOSDOC and BST in Newport, RI to the 116X's first command. While in Newport, RI, the 116X also incurs costs while attending SWOSDOC and BST. 'SWOSDOC' and 'BST_1' represent the costs of attending the Division Officer Course and Billet Specialty Training, respectively. 'POST-SWOS' represents the pay of the perspective 111X earned while working towards qualifying as a SWO onboard the ship after SWOS.

However, when the "Sea to SWOS" transformation takes effect in December 2002, the DOSP will change dramatically. Equation (2) describes the qualification pipeline for 111Xs.

$$(2)\ 111X_2 = PCS + BST_2 + BOLTC + CBT + PRE\text{-}OOD\ TRAINING + TDY + T\text{-}SWOS + POST\text{-}OOD\ TRAINING$$

Based on the "Sea to SWOS" training initiative, there are two distinct phases of shipboard training. The first phase, 'PRE-OOD TRAINING,' represents the pay of the

116X earned while qualifying as Officer of the Deck (Underway), which for this thesis' purpose captures the relevant time before the 116X attends T-SWOS. For simplicity, this thesis assumes an 116X will immediately attend T-SWOS once qualified as OOD. 'POST-OOD TRAINING' indicates the pay of the 116X earned after qualification as Officer of the Deck; the relevant time after the 116X returns to his command from T-SWOS to qualification as a Surface Warfare Officer. Associated 'TDY' costs consist of transportation and per diem with an 116X's travel between homeport to Newport and back. 'T-SWOS' indicates the costs incurred by the 116X while participating in T-SWOS. 'BST_2' and 'BOLTC' represent the costs associated with attending Billet Specialty Training and the Basic Officer Leadership Training Course in FCAs that once occurred in Newport, RI. The costs incurred by attending BOLTC and BST in FCAs will be equivalent in cost and quality to the BOLTC and BST taught in Newport, RI. The SWO leadership's decision to suspend BST training in Newport and use cost savings to relocate courses to FCAs or develop interactive course to replace BST supports the cost assumption. 'CBT' represents the costs incurred for an 116X participating in CBT onboard the ship.

B. PERMANENT CHANGE OF STATION COSTS

The Department of the Navy's FY 2003 budget contains specific information for calculating officer PCS costs. Statistics for accession travel ($25,380,000), training travel ($32,672,000), operational travel between duty stations ($47,179,000), rotational travel to and from overseas ($81,038,000), separation travel ($19,834,000), and travel of organized units ($2,839,000) for officers is available. The sum of these figures divided by projected number of naval officers (53,866) yields a result of $3,879 in FY 2003 dollars. This figure represents the average PCS cost per officer move [Refs. 23, 24].

C. SWOSDOC AND BST COSTS

1. SWOSDOC Costs

Direct Cost Per Grad Cost Analysis Reports produced by the Naval Education and Training Professional Development and Technology Center (NETPDTC) reflect Operations and Maintenance, Navy (OMN) and Military Personnel, Navy (MPN) costs associated with all training courses offered by the Naval Education and Training

Command, including SWOSDOC and Surface Warfare Officer associated BST. The data contained in "Direct Cost Per Grad Cost Analysis Reports" reflect direct and indirect costs of instructors, support personnel, curriculum material, curriculum development, supplies, contracts, equipment maintenance, and base support costs incurred. The military pay and allowances of instructors, support personnel, and students incurred during training are included as well.

The NETPDTC generated reports reflect the average cost to train one equivalent graduate, considering attrition. The number of equivalent graduates is determined by converting total course work units to training man weeks. The total man weeks less man weeks of students that attrite, when divided by curriculum length, gives you the number of equivalent graduates. This formula distributes the costs of students who attrite to graduates of the course. OMN and MPN costs provided by NETPDTC were in FY 2001 dollars. These figures divided by OMN and MPN raw inflation indices of .9707 and .8993 [Ref. 25] respectively converted these figures into FY 2003 dollars.

SWOSDOC Courses	Equivalent Graduates	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	Total Course Cost (FY01$)
Core Phase I Course					
-Common Core Phase I	856	$1,028	$16,246	**$17,274**	**$14,786,544**
Core Phase II Courses					
-DDG-51 Basic GT	169	$456	$7,692	$8,148	$1,377,012
-CG-47/DD-963 Basic GT	223	$458	$12,831	$13,289	$2,963,447
-FFG-7 Basic GT	131	$424	$7,508	$7,932	$1,039,092
-SWO Basic Diesel	120	$444	$13,184	$13,628	$1,635,360
-SWO Basic Steam	190	$448	$12,437	$12,885	$2,448,150
-Core Phase II Subtotals	833	$2,230	$53,652	$55,882	$9,463,061
-Core Phase II Cost Per Grad				**$11,360**	
SWOSDOC Courses	**Equivalent Graduates**	**OMN Cost (FY03$)**	**MPN Cost (FY03$)**	**Cost Per Grad (FY03$)**	**Total Course Cost (FY03$)**
Core Phase I Course					
-Common Core Phase I	856	$1,059	$18,065	**$19,124**	**$16,370,308**
Core Phase II Courses					
-DDG-51 Basic GT	169	$470	$8,553	$9,023	$1,524,901
-CG-47/DD-963 Basic GT	223	$472	$14,268	$14,740	$3,286,928
-FFG-7 Basic GT	131	$437	$8,349	$8,786	$1,150,902
-SWO Basic Diesel	120	$457	$14,660	$15,118	$1,814,123
-SWO Basic Steam	190	$462	$13,830	$14,291	$2,715,322
-Core Phase II Subtotals	833	$2,297	$59,660	$61,957	$10,492,177
-Core Phase II Cost Per Grad				**$12,596**	

Table 1. SWOSDOC Course Costs in FY01$ and FY03$ [Ref. 26]

The total cost of 'SWOSDOC' consists of the cost of the two core phases. The eleven-week long Core Phase I, which all 116Xs attend, cost $19,124 in FY 2003 dollars ($17,274 in FY 2001 dollars) per equivalent graduate [Table 1].

The six-week long Core Phase II focused on specific engineering training. There are five basic engineering courses that can be attended in Core Phase II depending on the 116X's first ship; DDG-51 Basic Gas Turbine Engineering, CG-47/DD-963 Basic Gas Turbine Engineering, FFG-7 Basic Gas Turbine Engineering, SWO Basic Diesel Engineering, and SWO Basic Steam Engineering.

A weighted average Core Phase II cost per equivalent graduate was calculated. This calculation used the number of equivalent graduates per Core Phase II basic engineering course multiplied by the cost of the course per equivalent graduate to obtain a course subtotal. The five course subtotals were summed and then divided by the overall number of Core Phase II equivalent graduates, which determined the average Core Phase II cost per equivalent graduate. The weighted average Core Phase II cost per equivalent graduate is $12,596 in FY 2003 dollars ($11,360 in FY 2001 dollars) [Table 1]. As a result, the total cost of 'SWOSDOC' is $31,720 in FY 2003 dollars ($28,634 in FY 2001 dollars).

2. BST Costs

After completing SWOSDOC, 116Xs attend BST. BST requirements are standard, based on billet and ship type. The Surface Warfare Officer Placement Branch of the Navy Personnel Command has a matrix of required BST for each first-tour division officer billet by ship class in the Navy. The cost of each BST track for each ship class, using "Direct Cost Per Grad Cost Analysis Reports" is in Appendix B. The individual BST tracks within each ship class were combined into an average BST cost per ship type. The product of the average BST cost per ship and the number ships in each ship class yields an annual total BST cost per ship class. The annual BST costs per ship class summed and then divided by the total number of first tour BST tracks yields an average first-tour division officer BST cost. The average cost of 'BST' for each first-tour division officer is $11,640 in FY 2003 dollars [Table 2].

Ship Class	Number of Ships	Average BST Cost Per Class (FY03$)	Annual Total BST Cost Per Class (FY03$)
DDG-51	35	$13,816	$483,560
CG-47	27	$13,870	$374,490
FFG-7	32	$9,303	$297,696
MCM-1	14	$19,419	$271,866
DD-963	16	$8,303	$132,848
LPD-4	11	$9,004	$99,044
LSD-41	12	$8,190	$98,280
LHD-1	7	$9,004	$63,028
AOE-1	4	$13,769	$55,076
LHA-1	5	$9,004	$45,020
LSD-36	3	$9,004	$27,012
AOE-6	2	$9,031	$18,062
LCC-19	2	$9,004	$18,008
AGF-3/11	2	$9,004	$18,008
Totals	172	$149,725	$2,001,998
Average First Tour Division Officer BST Cost:			$11,640

Table 2. First Tour Division Officer Billet Specialty Training Cost [Ref. 26]

3. Basic Officer Leadership Training Costs

By reviewing the specific line item in the "Data Cost Per Grad Analysis Report that refers to the Basic Officer Leadership Training Course, the cost of 'BOLTC' can be found. This course, incorporated into the final two weeks of SWOSDOC Core Phase I for 116Xs, is also a stand-alone course at Newport, RI and throughout other FCAs. The total cost of 'BOLTC' per equivalent graduate is $3,097 ($148 OMN, $2,949 MPN) in FY 2001 dollars. After applying OMN and MPN raw inflation indices, the total cost of 'BOLTC' in FY 2003 dollars is $3,432 ($152 OMN, $3,279 MPN).

D. SHIPBOARD TRAINING COSTS

1. Overview

This thesis will use the percentage of an 116X's pay earned while training to become a qualified SWO as the basis for calculating shipboard training costs. The percentage of an 116X's pay earned while training quantifies financially, the amount of shipboard time dedicated to qualifying as an 111X. For calculation purposes, an 116X on watch is actively working towards fulfilling PQS requirements, thus all pay earned while on watch is a shipboard training cost. As officers gain experience, fulfill PQS requirements, and get closer to qualification, they will spend less of their watchstanding

time focusing on PQS, however, this thesis will use 100 percent of an 116X's time on watch for simplicity purposes in calculating shipboard training costs. An 116X executing duties besides standing watch is not considered a shipboard training cost. The 'POST-SWOS' cost calculation consists of a percentage of the 116X's pay earned while standing watch during the 18 months allotted to qualify as a SWO under the current DOSP. A period of 17 months, the average amount of time it takes to qualify as a SWO under the current DOSP and maximum amount of shipboard training anticipated to qualify under the "Sea to SWOS" initiative (15 months of 'PRE-OOD TRAINING' and 2 months of 'POST-OOD TRAINING') is used for comparison purposes.

With respect to the "Sea to SWOS" training initiative, the 'PRE-OOD TRAINING' cost is composed of the 116X's pay earned while standing watch before reporting to T-SWOS. 'POST-OOD TRAINING' considers the cost incurred by an 116X while on watch after returning from T-SWOS until qualification. There is also an opportunity cost for officers charged with providing and supervising the training of 116Xs. The time allocated by qualified 111Xs, particularly the Senior Watch Officer, to assist and mentor 116Xs is time that would otherwise go towards their own professional development. However, the quantification of this opportunity cost is beyond the scope of this thesis.

2. Length of Training

Under the current DOSP, 116Xs have 18 months from checking onboard their first ship to complete their SWO PQS and qualify as SWOs. The SWO PQS is in itself a series of PQS watch stations ranging from Officer of the Deck (In-port) to Combat Information Center Watch Officer to Officer of the Deck (Underway). This thesis assumes both in port and underway watches provide the experience and skills necessary to fulfill these PQS requirements and qualify as an 111X.

With the 'Sea to SWOS' training initiative, there are two distinct shipboard training phases. The first phase is the 6-15 month period where an 116X earns their OOD (Underway) designation before reporting to T-SWOS. The second phase consists of the 1-2 month shipboard period, after an OOD-qualified 116X returns from T-SWOS before qualifying as a SWO.

3. Operational Tempo

Operational TEMPO (OPTEMPO) is the average amount of time a ship is at sea away from homeport. The Department of the Navy's 2003 Budget provides funds to achieve an OPTEMPO goal of 54.0 underway days per quarter for deployed forces and 28.0 underway days per quarter for non-deployed forces [Ref. 27]. Under the current DOSP, SWOs must qualify within 18 months of reporting onboard their first ship, which mirrors the Interdeployment Training Cycle (IDTC) for ships. A normal IDTC consists of 12 months (four quarters) of non-deployed training near their homeport. A six-month (two quarters) overseas deployment follows. The year's worth of non-deployed quarters yields 112 underway days (16 weeks) and 36 weeks in port. The deployed OPTEMPO equates to 108 days (15.43 weeks) underway and 74 days in port (10.57 weeks).

4. Navy Standard Workweeks

Though not typically applied to officers, this thesis will apply the idea of Navy Standard Workweeks to quantify the amount of time an 116X spends on watch. Appendix C of the Manual of Navy Total Force Manpower Policies and Procedures employs averaging techniques in computing the elements that comprise the Navy workweek due to its complicated operating environment that includes watchstanding and duty requirements. For example, Appendix C represents fleet ships at-sea steaming at Condition III (Wartime Readiness) in a three-section (two and four watches per day) watch rotation while the shore workweek assumes a 5-day, 40-hour in-port workweek.

This thesis utilized the same assumptions outlined in Appendix C for determining the total number of hours of underway watchstanding stood by an 116X while earning their SWO pin. According to Appendix C, there are 81.00 hours in a standard underway workweek with 70.00 hours allocated for productive work. 56.00 of the 70.00 hours allotted for productive work are devoted to watchstanding, while the other 14.00 hours are reserved for "other work" [Ref. 28].

However, besides the 5-day, 40-hour (33.38 hours productive work) workweek general statement on working hours in port, Appendix C does not further describe the standard workweek of shipboard personnel in port. The in port shore workweek statement does not consider duty, a fact of shipboard life, when shipboard personnel are

required to stay onboard the ship to support emergency response teams and in-port watchstanding requirements.

LT Michael D. Makee, in his *Training Costs for Junior Surface Warfare Officers* thesis in 1999, determined, through conversations with the Navy Manpower Analysis Center, that watchstanding added 10 hours to the standard 40-hour workweek in a ship's homeport; assuming ships were in six-section duty. Watchstanding added 20 hours to the standard 40-hour workweek while in port overseas, given that the ship was in three-section duty [Ref. 29].

5. Calculation of Shipboard Training Costs

Table 3 summarizes the total hours of watch stood by an 116X over an 18-month shipboard IDTC, which correlates to the 18-month period 116Xs have to qualify from reporting onboard to earn their SWO qualification. Table 4 represents the amount of time that an 116X devotes to other non-SWO qualification related shipboard activities.

Deployed Ships	Weeks in 2 Quarters	Watch Hours Per Week	Total Hours
Underway	15.43	56	864
In Port	10.57	20	211
Non-Deployed Ships	**Weeks in 4 Quarters**	**Watch Hours Per Week**	**Total Hours**
Underway	16	56	896
In Port	36	10	360
		Total Hours Watch:	2331

Table 3. Total Hours of Watch Stood by an 116X Over an 18-Month IDTC

Deployed Ships	Weeks in 2 Quarters	Non-Watch Hours Per Week	Total Hours
Underway	15.43	14	216
In Port	10.57	40	423
Non-Deployed Ships	**Weeks in 4 Quarters**	**Non-Watch Hours Per Week**	**Total Hours**
Underway	16	14	224
In Port	36	40	1440
		Total Hours Other Work:	2303

Table 4. Total Hours of Other Work by an 116X Over an 18-Month IDTC

The total hours of watch stood by an 116X summed with the total hours of other work performed over an 18-month IDTC yields the total amount of productive work performed by an 116X. Based on the forecasted OPTEMPO in FY 2003, 116Xs will

productively work 4,540 hours over an 18-month period. The total hours of watch stood by an 116X, 2,331 hours, divided by the total hours of productive work, 4,634 hours, generates a figure of 50.30 percent. As a result, 50.30 percent of an 116X's working hours are on watch. This percentage multiplied by $101,109 of pay earned over an 18-month period, the product of $67,406, the Annual DOD Composite Rate for Ensigns (obtained from the Department of the Navy's Composite Standard Pay and Reimbursement Rates listed in Appendix C) in FY 2003 dollars and 1.5 years, yields a cost figure of $50,858 [Ref. 30]. This figure, divided by 18 months, generates a monthly training rate of $2,825. This figure multiplied by 17 months, the average amount of time it takes an 116X to qualify as a SWO yields a 'POST-SWOS' cost of $48,025.

The methods for calculating 'PRE-OOD TRAINING' and 'POST-OOD TRAINING' costs associated with the 'Sea to SWOS' transformation are similar. The product of the Annual DOD Composite Rate for Ensigns, $67,406, 50.30 percent, the percentage of time an officer stands watch, and the length of training for each phase (in years) yields the training costs. The maximum anticipated length of time expected to earn an OOD (Underway) letter, fifteen months (1.25 years) leads to a 'PRE-OOD TRAINING' cost of $42,382. 'POST-OOD TRAINING' cost is the product of the Annual DOD Composite Rate, 50.30 percent, and the maximum amount of time expected to qualify as a SWO upon return from T-SWOS, two months (.167 years). 'POST-OOD TRAINING' cost is $5,662.

To calculate 'CBT' cost, the hourly pay rate for an 116X needs to be calculated. The 'CBT' cost, $17,276, is the product of the hourly multiplicative factor, .00055 (obtained from the Department of Defense Financial Management Regulation, Volume 11A), the number of hours projected for an 116X to complete CBT, 466 hours [Ref. 31], and the Annual DOD Composite Rate for Ensigns, $67,406.

E. TAILORED SWOS COSTS

Since the "Sea to SWOS" transformation's implementation will not begin until December 2002, financial information on Tailored SWOS (T-SWOS) is not yet available. However, the overall cost to operate SWOSDOC in FY 2003 dollars under the current DOSP is available. The costs to operate the SWOSDOC Core Phases I (11 weeks) and II

(6 weeks) are $14,786,544 and $16,370,308 respectively [Table 1]. An average of an additional $7,571,429 per year in funding is set aside in the DON's budget for "reengineering Navigation, Shiphandling, and Seamanship (NSS) training to provide PC-based trainers at SWOS and onboard Fleet units for initial skill and proficiency training" [Ref. 32]. Officers must complete shipboard CBT and be qualified as OOD (Underway) by their Commanding Officers in order to attend T-SWOS, so attrition rates will most likely be negligible.

The sum of the costs to operate SWOSDOC and additional reengineering funding is $38,728,281 in FY 2003. These costs divided by 833 equivalent graduates, the number of graduates that completed both SWOSDOC Core Phases in FY 2001 [Table 1], leads to a result of $46,493 per equivalent graduate at SWOSDOC over a 17-week period. This result divided by 17-weeks yields a SWOSDOC weekly cost of $2,735 per equivalent graduate. T-SWOS lasts from three to five weeks. This weekly cost multiplied by five weeks, the maximum amount of time an 116X can expect to stay in Newport, RI, yields a 'T-SWOS' cost of $13,675 per equivalent graduate.

The planned funding profile through FY 2009 for the "SWOS Train to Qualify" initiative, another phrase used to describe the "Sea to SWOS' initiative is listed in Table 5 [Ref. 33]. The funding profile describes the additional costs needed for SWOS to implement this training initiative. The $3.9 million in FY 2003 is a "wedge" used to get this additional funding requirement programmed into the Future Years Defense Program (FYDP) [Ref. 34].

SWOS Train To Qualify Costs	FY03	FY04	FY05	FY06	FY07	FY08	FY09	Total
SWOS Curriculum Reengineering	0.0	4.2	2.2	0.3	0.3	0.3	0.3	7.4
SWOS MILCON Outfitting	0.0	2.5	2.5	0.0	0.0	0.0	0.0	5.0
Reconfigurable Trainers	0.0	0.0	3.3	5.7	9.4	9.1	9.2	36.7
SWOS Train To Qualify Total ($M)	**3.9**	**6.7**	**8.0**	**6.0**	**9.7**	**9.4**	**9.5**	**53.0**

Table 5. SWOS Train to Qualify Future Years Funding Profile [Ref. 31]

F. TEMPORARY DUTY COSTS

1. Transportation Costs

Eleven locations throughout the world base U.S. naval ships that billet first-tour division officers. 116Xs, after completing CBT and earning their OOD letters, must

report to Newport, RI for three to five weeks of TDY to complete T-SWOS. These officers will either drive privately owned conveyances (POCs) or fly and presumably rent cars for the duration of their stay.

An assumption made when calculating transportation costs is that a percentage of officers assigned to ships in Norfolk, VA, Mayport, FL, and Pascagoula, MS will use privately owned conveyances (POCs), presumably automobiles over motorcycles or privately own planes, since they are within reasonable driving distance of T-SWOS. This thesis defines "reasonable driving distance" as a homeport within 1,560 miles of T-SWOS; the distance covered by driving 12 hours a day at 65 miles per hour for two days (a weekend). It also is more economical to have the officers from these homeports drive instead of fly and rent cars [Appendix D, Table 29]. 116Xs that have POCs do not require car rentals. However, the government cannot force personnel to use POCs for official government travel.

The decision to operate a POC or fly and rent a vehicle at government expense in Newport rests with the individual officer. This thesis assumes that 50 percent of officers assigned to Norfolk, VA will operate POCs to make the trip to T-SWOS. In addition, since Mayport, FL, the next closest homeport, is over twice the distance from Newport (1,123.8 miles compared to 539.4 miles) [Appendix D, Table 27], this thesis assumes that only 24.0 percent [(539.4 / 1123.8 miles) * 50 percent (the percentage of officers choosing to drive from Norfolk)] of officers assigned to ships in Mayport will choose to use POCs. Applying the same rationale to officers hailing from Pascagoula, this thesis assumes that only 18.8 percent [(539.4 / 1431.5 miles) * 50 percent] from Pascagoula will operate POCs. All officers assigned to homeports outside "reasonable driving" distance will fly and rent economy-class cars at a price of $45 per day (the government rate of an economy car at the three government contracted rental car firms in Newport) for the duration of their stay.

Homeports	First Tour Billets	Round Trip Air Fare	Car Rental 5 Week Use	Round Trip POV	Transport Cost Per Student	Weighted Subtotal Cost
Norfolk, VA	210	$0	$0	$393.76	$393.76	$82,690.02
Norfolk, VA	210	$198	$1,575	$0.00	$1,773.00	$372,330.00
Mayport, FL	87	$198	$1,575	$0.00	$1,773.00	$154,251.00
Mayport, FL	27	$0	$0	$820.37	$820.37	$22,150.10
Pascagoula, MS	31	$524	$1,575	$0.00	$2,099.00	$65,069.00
Pascagoula, MS	7	$0	$0	$1,045.00	$1,045.00	$7,314.97
Ingleside, TX	20	$342	$1,575	$0.00	$1,917.00	$38,340.00
San Diego, CA	321	$350	$1,575	$0.00	$1,925.00	$617,925.00
Everett, WA	61	$350	$1,575	$0.00	$1,925.00	$117,425.00
Pearl Harbor, HI	79	$656	$1,575	$0.00	$2,231.00	$176,249.00
Yokosuka, Japan	78	$600	$1,575	$0.00	$2,175.00	$169,650.00
Sasebo, Japan	28	$600	$1,575	$0.00	$2,175.00	$60,900.00
Gaeta, Italy	6	$796	$1,575	$0.00	$2,371.00	$14,226.00
Manama, Bahrain	4	$2,668	$1,575	$0.00	$4,243.00	$16,972.00
Totals	1169					$1,915,492.08
					Average Transportation Cost Per Officer:	**$1,638.57**

Table 6. Average Roundtrip Transportation Cost from Homeport to T-SWOS

Distances from the Defense Table of Official Distances [Ref. 35], TDY POV mileage rates from the Per Diem Committee [Ref. 36], and government air fares from the U.S. General Services Administration [Ref. 37] provide the necessary detail to describe transportation costs. The calculations for determining the cost of plane tickets, car rentals, and reimbursable POV costs from the eleven homeports to T-SWOS are in Appendix D. Table 6 uses a weighted average to account for the number of first tour division officer billets in each homeport. The table summarizes the costs associated with transporting officers from their homeports to T-SWOS. The average transportation cost, which feeds into 'TDY' costs per officer, is $1,639 in FY 2003 dollars.

2. Per Diem Costs

Per diem allowances are designed to offset the costs for lodging, meals, and related incidental expenses. The U.S. General Services Administration sets per diem rates in the United States annually. The amount of per diem an officer is entitled to be reimbursed upon completion of TDY depends on several factors: the officer's TDY location, the time of year, availability of government quarters, and the availability of government messing [Ref 38].

An 116X must look for government quarters first in Newport, RI. There are two choices, either Navy Bachelor Housing or the Navy Lodge. Based on the websites for

Navy Bachelor Housing, the maximum rate for visitor's quarters can go up to $20 per day. Based on a phone conversation with the Navy Lodge service line, rates at the Navy Lodge in Newport depend on the room selected. They have $56 and $70 per day rooms. The average of these two rates is $63. If government quarters are not available, the person seeking quarters is entitled to the maximum lodging rate, which for Newport, RI is $79 (from January 01 to March 31) or $111 (for the remainder of the year) [Ref. 39]. A weighted average of the maximum lodging rate yields $103 [$79(.25) + $111(.75)]. The availability of government quarters is highly variable and difficult to capture. There is an equal probability of obtaining quarters in Navy Bachelor Housing, the Navy Lodge, or being forced to seek quarters out in town. The average lodging rate is $62, found by taking an average of daily quarters' rates ($20 + $63 + $103).

The meals and incidental rate depends on whether government messing is available. If it is, the full meal government rate is $8.10 a day. If not, the local meal rate in Newport, RI is $44 day, regardless of the time of year. There is an equal probability of obtaining government messing or not. A simple average yields a meals and incidental rate of $26 per day. The lodging rate ($62) summed with the messing and incidental rate ($26) generates a result of $88 of per diem a day. This figure is multiplied by 35 days, the maximum number of days expected at T-SWOS, yielding a per diem cost of $3,080 per 116X sent TDY to T-SWOS.

The sum of transportation costs ($1,639) and per diem costs ($3,080) yields an overall 'TDY' cost of $4,719.

G. JUNIOR SWO RETENTION STATISTICS

The Surface Warfare Officer Community Manager tracks retention statistics in the SWO community. Retention data for YG 1987 through YG 2001 is posted on the SWO Community Manager website. Along with raw YG inventories, the data include the current retention rate by YG, retention rate at 9 Years Commissioned Service (YCS) by YG, projected inventory in FY 2002 by YG, and required inventory for FY 2002 by YG.

The retention rate is current YG inventory divided by that YG's inventory at 3 YCS. The inventory at 3 YCS is the base for a SWO YG since the Surface Warfare Officer community continues to receive accessions after the first year of commissioning,

primarily through lateral transfers from other warfare communities. Historically, SWO inventories peak at the 3 YCS mark.

The retention rate at 9 YCS versus 3 YCS for a YG is the benchmark used by the SWO Community Manager to track junior officer retention. The 9 YCS point is used to account for all the variability associated with the SWO pipeline before an 111X reaches their minimum service obligation; TDY before reporting to SWOSDOC, different BST lengths between division officer tours, variable shore duty length, minimum tour lengths, and time on limited duty. By the 9 YCS point, the SWO Community Manager assumes that all junior officers have made the decision to continue in the SWO pipeline to SWO Department Head School, lateral transfer to another warfare community, or resign from the service [Ref. 40].

Based on Table 7, the average 9 YCS VS: 3 YCS retention rate since 1987 is 25.1% +/- 2.7%. The average number in a YG's inventory at the 3 YCS mark since 1995, the first year of the DOSP, is 832 officers. The 25-year average 9 YCS VS: 3 YCS is 29.5% +/- 5.7% [Ref. 41].

YG VS: YCS	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01
1	1407	1298	1070	951	955	799	664	699	800	834	696	700	846	965	903
2	1527	1337	1154	990	999	813	725	734	816	833	741	758	890	986	918
3	1495	1352	1166	1005	974	759	781	753	826	811	727	760	883	984	
4	1392	1278	1082	910	857	635	712	703	757	729	700	717	842		
5	995	923	785	678	665	629	616	630	633	655	603	700			
6	727	699	577	557	523	511	476	475	515	520	569				
7	543	528	510	421	422	385	361	370	426	489					
8	396	383	397	308	320	269	265	241	367						
9	320	318	310	237	225	220	196	214							
10	308	262	260	205	207	204	188								
11	259	231	237	183	191	194									
12	216	189	190	169	176										
13	184	172	178	158											
14	170	159	168												
15	170	151													
16	162														
Retention Rate:	11%	11%	14%	16%	18%	26%	24%	28%	44%	60%	78%	92%	95%	- - -	- - -
9 YCS vs. 3 YCS	21%	24%	27%	24%	23%	29%	25%	28%	- - -	- - -	- - -	- - -	- - -	- - -	- - -
Projected Inventory	159	146	167	156	171	192	181	187	286	446	516	638	833	981	916
Required Inventory	170	180	190	200	210	230	250	275	320	400	505	655	835	930	920

Table 7. Projected and Required Inventories for FY 2002, Retention Rates, and Year Group VS: Years Commissioned Service Inventories [Ref. 42]

H. ACCESSION COSTS

For every junior officer that resigns or lateral transfers, there is a requirement to access and train a new officer. Unrestricted Line (URL) officers enter the Naval service from different commissioning sources. These commissioning sources receive funding from two budget line items, 'Officer Acquisition' and 'Reserve Officer Training Corps' under the OMN appropriation account. The 'Officer Acquisition' line item covers military training and indoctrination for officer candidates as part of a college curriculum or post-baccalaureate program such as the United States Naval Academy and Officer Candidate School and preparatory training for programs like the Naval Academy Preparatory School and Broadened Opportunity for Officer Selection and Training. The 'Reserve Officer Training Corps' budget line item subsidizes payments for college tuition, fees, and books. In addition, it pays the administrative expenses to operate Naval Reserve Officer Training Corps units, purchase Naval Science textbooks, materials, training aids, and the costs to operate several summer training sites.

The total amount of both budget line items divided by the total number of officer candidates yield the average OMN cost of an officer candidate. This figure added to the Annual DOD Composite Rate for Cadets (Appendix C) and then multiplied by an average of four years of training produces the average cost an officer accession in FY 2003 dollars, which is $118,037 [Table 8].

OMN Officer Acquisition Account Total for FY 2003:	$115,943,000
Officer Candidates Under Officer Acquisition Account:	5,633
OMN Cost Per Candidate Under Officer Acquisition Account:	$20,583
OMN Reserve Officer Training Corps Account Total for FY 2003:	$83,461,000
Officer Candidates Under Reserve Officer Training Corps Account:	6,045
OMN Cost Per Candidate Under ROTC Account:	$13,807
Total of OMN Officer Acquisition and ROTC Accounts:	$199,404,000
Total Officer Candidate Accession Load:	11,678
Average OMN Cost of an Officer Candidate in FY 2003:	**$17,075**
Annual DOD Composite Rate for Cadets in FY 2003:	**$12,434**
Average Cost of an URL Officer Candidate in FY 2003 Dollars:	**$29,509**
Number of Years Training:	**4**
Annual Average Cost of an Officer Accession in FY 2003 Dollars:	**$118,037**

Table 8. Average Cost of an Officer Accession in FY 2003 [Ref. 43, 44]

I. SUMMARY

Equation (1) illustrates the cost for an 116X to qualify as an 111X based on the current DOSP.

$$(1)\ 111X_1 = PCS_1 + SWOSDOC + BST_1 + PCS_2 + POST\text{-}SWOS$$

Based on the methodology used in this chapter, the two 'PCS' moves an Ensign makes equals $7,758. The cost of 'SWOSDOC' is $31,720 per equivalent graduate and 'BST_1' is $11,640 per equivalent graduate. 'POST-SWOS' costs incurred are $48,025 per 116X. The total cost to qualify an 111X under the current DOSP is $99,143 in FY 2003 dollars.

Equation (2) describes the cost for an 116X to qualify as an 111X under the "Sea to SWOS" training initiative.

$$(2)\ 111X_2 = PCS + BST_2 + BOLTC + CBT + PRE\text{-}OOD\ TRAINING + TDY + T\text{-}SWOS + POST\text{-}OOD\ TRAINING$$

Based on the methodology used in this chapter, 'PCS' costs for an Ensign equals $3,879. '$BST_2$' costs are $11,640 per equivalent graduate, while 'BOLTC' costs are $3,432 per equivalent graduate. 'CBT' costs per participant are $17,276. 'PRE-OOD TRAINING' costs incurred are $42,382 per 116X, while the 'POST-OOD TRAINING' cost incurred is $5,662 per 116X. The 'TDY' cost for an 116X to go to Newport, RI and back to their ship is $4,719. The projected 'T-SWOS' cost per equivalent graduate is $13,675. The total cost to qualify an 111X under the proposed "Sea to SWOS" training initiative will be $102,665 in FY 2003 dollars, $3,522 per officer more than under the current DOSP.

IV. PRESENTATION OF DATA COLLECTED

A. RETURN ON INVESTMENT

This chapter organizes data collected in Chapter III to develop Return on Investment (ROI) calculations, factoring in retention to compare the Division Officer Sequencing Plan (DOSP) implemented in 1995 to the proposed "Sea to SWOS" training initiative. The denominator of the ROI calculation captures the annual cost to train a cohort of 116Xs in a given year, while the numerator describes the benefits gained by retaining a portion of these officers. The ROI calculations developed include training costs for qualifying as an 111X, average accession rates and costs, the 9 YCS VS: 3 YCS retention rate, and Surface Warfare Officer Continuation Pay (SWOCP). The following equation describes the calculation used to obtain ROI.

$$(3)\ ROI_i = \frac{[(\text{Accession Costs Avoided} + 111X_j - \text{SWOCP}) * (\text{Officers Retained})]}{[111X_i * (116\text{Xs Accessed})]}$$

'$111X_1$', the cost to train an 111X under the current DOSP, or '$111X_2$', the cost to train an 111X under the proposed "Sea to SWOS" transformation, multiplied by the number of 116Xs accessed, is the program's investment cost. Cost avoidance is the primary benefit of retention. For each officer retained, fewer accessions are necessary. If an 111X remains in the community, the costs associated with training additional 116Xs to become an 111X are not required as well. Accession and training costs less SWOCP, incentive pay used to retain officers through Department Head, is the financial benefit of retaining a qualified Surface Warfare Officer in the community through Department Head School. The number of junior officers retained is the product of the number of 116Xs accessed multiplied by the 9 YCS VS: 3 YCS retention rate. The product of the number of junior officers retained with the financial benefits of retaining an 111X generates the program's overall financial benefits factoring in retention. The program's financial benefits divided by its investment costs yields the ROI. The developmental costs for shipboard CBT under the "Sea to SWOS" initiative is incorporated into '$111X_2$' through the 'T-SWOS' variable.

B. ROI FOR CURRENT DIVISION OFFICER SEQUENCING PLAN

For the current DOSP, the cost to train an 111X is $99,143 based on 17 months of shipboard training time (average amount of time to qualify as a SWO) and known SWOSDOC and BST operating costs. The cost of an officer accession is $118,037, while the cost of SWOCP is $50,000. The average 9 YCS VS: 3 YCS retention rate since 1987 is 25.1%. The average number in the YG's inventory at the 3 YCS mark since 1995, the first year of the DOSP, is 832 officers. The 9 YCS VS: 3 YCS retention rate multiplied by the average number of officers accessed since the implementation of the current DOSP produces an average of 209 retained officers per YG. These results substituted into equation 3 yields the following:

$$(3)\ ROI_1 = \frac{[(\$118{,}037 + \$99{,}143 - \$50{,}000) * (209\ \text{Officers Retained})]}{[\$99{,}143 * (832\ \text{Officers Accessed})]}$$

The annual ROI since the current DOSP implementation is 42.3% factoring in retention. Any modifications or changes to the DOSP should exceed the present ROI.

C. PROJECTED ROI FOR SEA TO SWOS TRAINING INITIATIVE

1. Projected ROI Using Fixed Periods of Training

Under the proposed "Sea to SWOS" training initiative, the cost to train an 111X is $102,665 based on 17 months of shipboard training time (15 months of 'PRE-OOD TRAINING' and 2 months of 'POST-OOD TRAINING'), projected T-SWOS operating costs, estimated TDY of 5 weeks, and associated curriculum development costs. The cost of an officer accession is $118,037, while the cost of SWOCP is $50,000. The average 9 YCS VS: 3 YCS retention rate since 1987 is 25.1%. The average number in the YG's inventory at the 3 YCS mark since 1995, the first year of the DOSP, is 832 officers. The 9 YCS VS: 3 YCS retention rate multiplied by the average number of officers accessed since the implementation of the current DOSP produces an average of 209 retained officers per YG. These results substituted into equation 3 yields the following:

$$(3)\ ROI_2 = \frac{[(\$118{,}037 + \$102{,}665 - \$50{,}000) * (209\ \text{Officers Retained})]}{[\$102{,}665 * (832\ \text{Officers Accessed})]}$$

The projected annual average ROI for the "Sea to SWOS" training initiative is 41.7% assuming 9 YCS VS: 3 YCS retention does not change, a .6% ROI less than the current DOSP.

2. Projected ROI Accounting for Variability in Length

However, there is great variability in calculating the training costs associated with the "Sea to SWOS" transformation. For example, ambitious 116Xs could conceivably complete CBT and qualify as underway Officers of the Deck in 6 months. In addition, some 116Xs will be at T-SWOS less than five weeks based on their knowledge, skills, and abilities, though 5 weeks is the expected stay for most 116Xs attending T-SWOS. This influences transportation and per diem costs, the two components that factor in 'TDY' costs. Finally, there is variability for the time it will take an 116X to qualify as an 111X after returning from T-SWOS. In all cases, training costs are less expensive if an 116X completes training sooner.

Crystal Ball, an add-in program for *Excel*, allows the addition of probabilistic distribution to variables in a spreadsheet model. This program uses Monte Carlo simulation to randomly select numbers from a probability distribution for use in simulating an exercise [Ref. 45]. This thesis uses *Crystal Ball* to forecast the average ROI, taking into account the variability of length in shipboard training on the waterfront, classroom training in Newport, RI, as well as variability in retention. The average ROI calculated covers FY 2003 to FY 2009; the latest year funding information for the "SWOS Train to Qualify" reengineering initiative is available.

Crystal Ball captures the uncertainty in length in the 'PRE-OOD TRAINING', 'POST-OOD TRAINING', 'T-SWOS', and 'TDY' variables. A uniform distribution is applicable, as in the cases of the 'PRE-OOD TRAINING' and 'POST-OOD TRAINING' when only the estimates for the best case (minimum length) and worst case (maximum length) scenarios are known. A triangular distribution is applicable when the estimates for the best case (minimum length), worst case (maximum length) and most likely scenario (expected length), as in the case of the 'T-SWOS' and 'TDY' variables are known. The most likely duration for an 116X at T-SWOS, five weeks, corresponds with

the worst case scenario. Table 9 summarizes the variables with probabilistic distributions used to forecast ROI.

Variable	Distribution	Range	Units
PRE-OOD TRAINING	Uniform	.5 - 1.25	Years
POST-OOD TRAINING	Uniform	.083 - .167	Years
TAD	Triangular	21 - 35	Days
T-SWOS LENGTH	Triangular	3 - 5	Weeks

Table 9. "Sea to SWOS" Return on Investment Variable Distributions and Ranges

The 9 YCS VS: 3 YCS retention rates from FY 2003 to FY 2009 is another variable that needs to be calculated in order to forecast ROI. A normal distribution, used when the mean and standard deviation are known, based on past retention rates is a candidate for use. Two retention rates based on past data are the average 9 YCS VS: 3 YCS retention rate since 1987 (25.1% +/- 2.7%) (Table 7) and the 25-year average 9 YCS VS: 3 YCS retention rate (29.5% +/- 5.7%).

A third possibility is using the following: 9 YCS VS: 3 YCS retention rate (33.0% +/- 5.0%). The Surface Warfare Community Manager states that a 33.0% 9 YCS VS: 3 YCS retention rate (on average 275 officers) would fill all SWO afloat department head billets and allow the flexibility for 111Xs to take the full 30 days allotted for PCS when transferring to or from billets. A 38.0% 9 YCS VS: 3 YCS retention rate would be ideal since it would allow for greater selectivity at Department Head screening boards. A 28.0% 9 YCS VS: 3 YCS retention rate would be the bare minimum rate necessary to fill SWO afloat department head billets, but there would be no slack for officers to take 30 days to transfer to or from billets or allowance for injured officers to go on limited duty. All three possible 9 YCS VS: 3 YCS retention rates, which factor into the number of officers retained per year, were used to calculate an average ROI from FY 2002 through FY 2009.

A spreadsheet model utilizing equation (3) and the variables described in Table 9 forecast the average annual ROI from FY 2003 through FY 2009 based on the three possible 9 YCS VS: 3 YCS retention rates. For each retention rate, there were 10,000 trials run. Based on the average 9 YCS VS: 3 YCS retention rate since 1987 (25.1% +/- 2.7%) (Table 7), the average ROI from FY 2003 to FY 2009 is 44.2%. Table 10

summarizes the statistics obtained by running this model. Figure 1 provides the probability distribution for average ROI for the "Sea to SWOS" training initiative based on 9 YCS VS: 3 YCS retention rates since 1987.

Statistics	Value
Trials	10,000
Mean	44.2%
Median	44.1%
Standard Deviation	2.5%
Variance	0.1%
Skewness	0.18
Kurtosis	2.83
Coefficient of Variability	0.06
Range Minimum	35.4%
Range Maximum	53.9%
Range Width	18.5%
Mean Standard Error	0.02%

Table 10. Statistical Summary of Annual Return on Investment Simulation Using 9 YCS VS: 3 YCS Retention Rate Since 1987

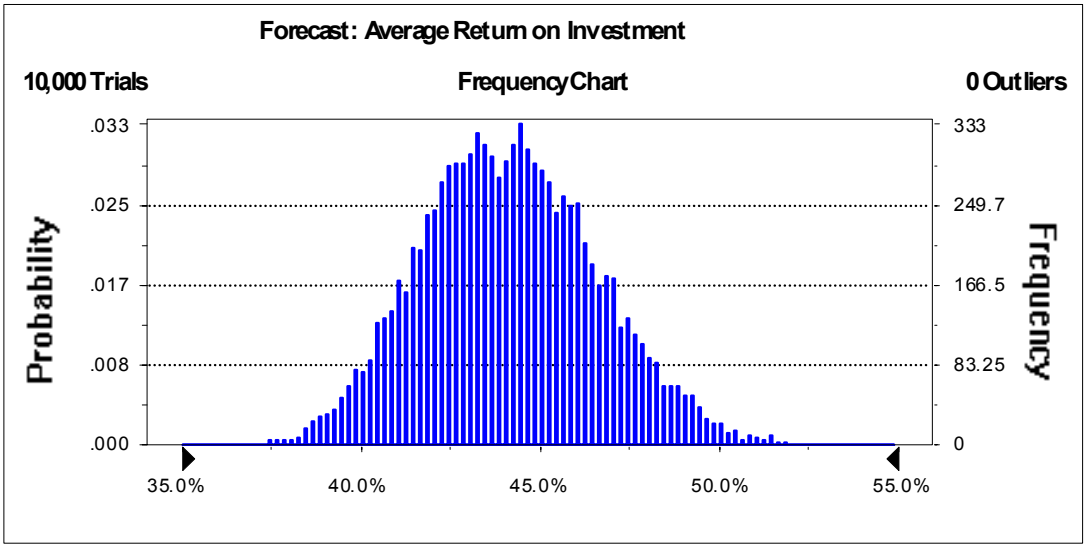

Figure 1. Forecasted Probability Distribution for Average Return on Investment Using 9 YCS VS: 3 YCS Retention Rate Since 1987

Based on the 25-year average 9 YCS VS: 3 YCS retention rate (29.5% +/- 5.7%), an additional 10,000 trials were run. The average ROI from FY 2003 to FY 2009 based on this retention rate is 52.0%. Table 11 summarizes the statistics obtained by running this model. Figure 2 provides the probability distribution for average ROI for the "Sea to SWOS" training initiative based on 9 YCS VS: 3 YCS retention rates over the past 25 years.

Statistics	Value
Trials	10,000
Mean	52.0%
Median	51.9%
Standard Deviation	4.3%
Variance	0.2%
Skewness	0.11
Kurtosis	3.03
Coefficient of Variability	0.08
Range Minimum	37.1%
Range Maximum	69.9%
Range Width	32.8%
Mean Standard Error	0.04%

Table 11. Statistical Summary of Annual Return on Investment Simulation Using Historic 9 YCS VS: 3 YCS Retention Rate Over Past 25 Years

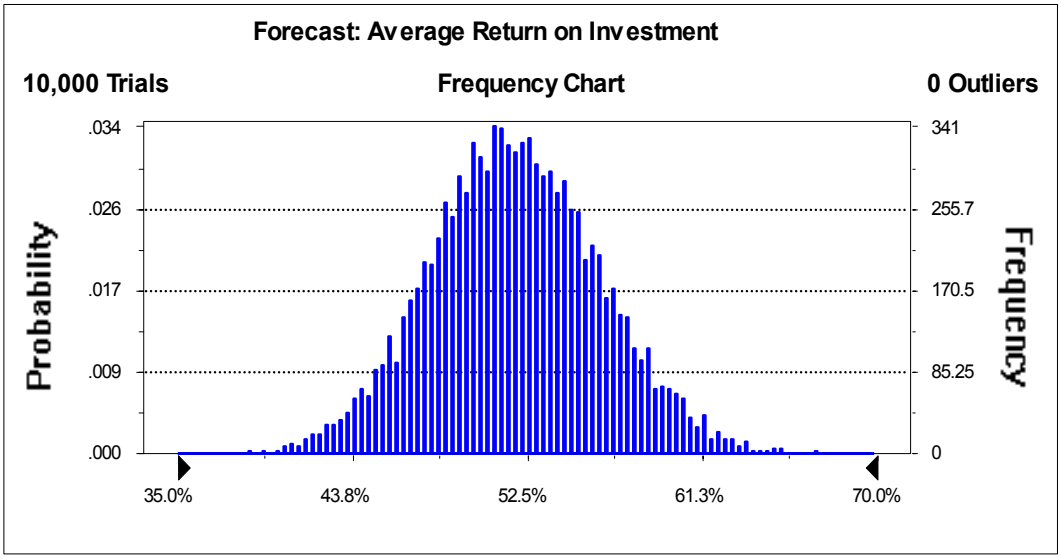

Figure 2. Forecasted Probability Distribution for Average Return on Investment Using 9 YCS VS: 3 YCS Retention Rate Over Past 25 Years

Based on the 9 YCS VS: 3 YCS retention rate (33.0% +/- 5.0%) developed by the Surface Warfare Officer Community Manager to meet SWO afloat department head billets, 10,000 trials were run. The average ROI from FY 2003 to FY 2009 based on this retention rate is 58.1%. Table 12 summarizes the statistics obtained by running this model. Figure 3 provides the probability distribution for average ROI for the "Sea to SWOS" training initiative using required 9 YCS VS: 3 YCS rates, as determined by the Surface Warfare Officer Community Manager, to meet fleet department head requirements.

Statistics	Value
Trials	10,000
Mean	58.1%
Median	58.0%
Standard Deviation	4.0%
Variance	0.2%
Skewness	0.12
Kurtosis	3.02
Coefficient of Variability	0.07
Range Minimum	44.9%
Range Maximum	74.1%
Range Width	29.2%
Mean Standard Error	0.04%

Table 12. Statistical Summary of Annual Return on Investment Simulation Using Surface Warfare Officer Community Manager 9 YCS VS: 3 YCS Retention Rates Based on Department Head Requirements

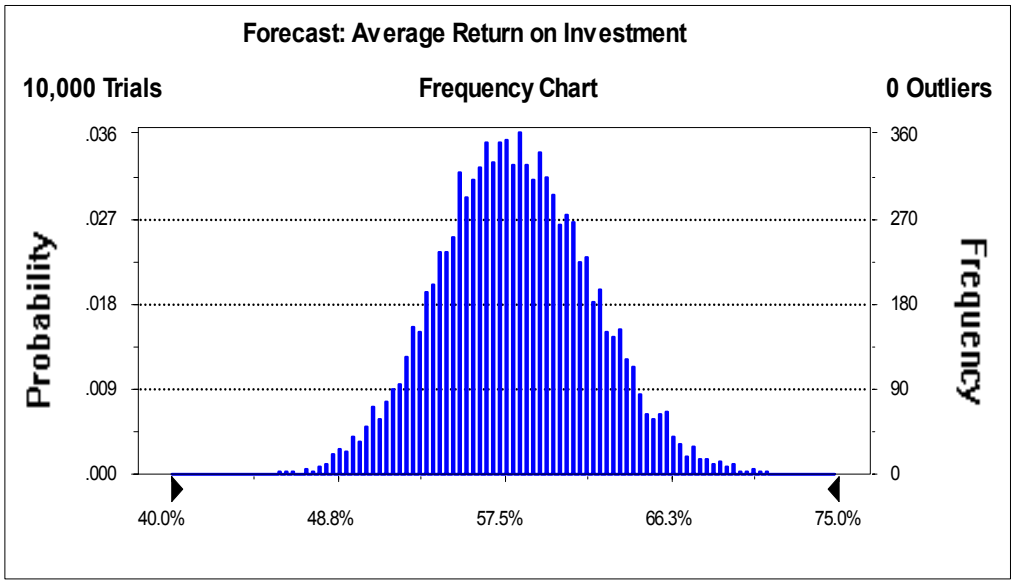

Figure 3. Forecasted Probability Distribution for Average Return on Investment Using Surface Warfare Officer Community Manager 9 YCS VS: 3 YCS Retention Rates Based on Department Head Requirements

Under all three 9 YCS VS: 3 YCS retention rates, the annual average ROI is greater than the 42.3% ROI achieved under the current DOSP.

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V. DATA ANALYSIS AND INTERPRETATION

A. OVERVIEW

This chapter analyzes and interprets the information obtained and presented in Chapters III and IV. This chapter will cover savings realized and costs incurred by the implementation of the "Sea to SWOS" training initiative versus the current DOSP. The potential impact of the training transformation on retention is the next component discussed. A sensitivity analysis concerning 9 YCS VS: 3 YCS retention rates and an analysis of the ROI equation developed in Chapter IV follow. This chapter concludes with the initiative's impact on shipboard manning.

B. COST SAVINGS REALIZED AT SWOSDOC

An 116X normally attends the two-phase SWOSDOC after commissioning for 17 weeks under the current DOSP. The cost per equivalent graduate to attend SWOSDOC is $31,720 in FY 2003 dollars

However, under the "Sea to SWOS" transformation, 116Xs attend Tailored SWOS (T-SWOS) for 3-5 weeks after earning their OOD (Underway letters) and completing shipboard CBT. As figured in Chapter III, the projected cost per equivalent graduate to attend T-SWOS for 5 weeks is $13,675 in FY 2003 dollars, a difference of $18,045 per equivalent graduate over 12 less weeks when compared to the current curriculum at SWOSDOC. This statistic multiplied by the average number in a YG's inventory at the 3 YCS mark since 1995, the first year of the DOSP, 832 officers, yields an annual savings of $15,013,440 in OMN and MPN costs for the Naval Education and Training Command and its subordinate command SWOSCOLCOM.

C. COSTS INCURRED

1. Implementation Costs at SWOSCOLCOM

From Table 5, the total cost to reengineer SWOS in order to implement the "SWOS Train to Qualify" initiative from FY 2003 through FY 2009 is $53.0 million. This figure divided by seven years yields an average annual implementation cost of $7.57

million at SWOSCOLCOM. The *Crystal Ball* simulation model factors these costs into the "Sea to SWOS" transformation ROI calculations.

2. CBT Costs

The costs incurred for an 116X while participating in CBT onboard the ship is $17,276 in FY 2003 dollars. This cost per 116X multiplied by the average number in a YG's inventory at the 3 YCS mark since 1995, the first year of the DOSP, 832 officers, yields an annual increase of $14,373,632 in additional shipboard training costs that were not incurred under the current DOSP.

3. Additional Navy Personnel Command Costs

Under the current DOSP, 116Xs permanently change station twice, once from their commissioning source to SWOSCOLCOM and then approximately six months later from SWOSCOLCOM to their first ship. The Navy, through the Navy Personnel Command, incurred a cost of $7,758 ($3,879 per officer PCS move in FY 2003 dollars times two moves) for each 116X in PCS costs.

Under the "Sea to SWOS" training initiative, 116Xs only PCS once, from their commissioning source to their first ship. However, after earning their OOD (Underway) letters and completing shipboard CBT, 116Xs attend T-SWOS on TDY for 3-5 weeks. The cost to PCS an officer once, $3,879, plus the TDY variable figured in Chapter III, $4,719, equals $8,598, a difference of $840 per officer when compared to the current DOSP. This difference multiplied by the average number in a YG's inventory at the 3 YCS mark since 1995, the first year of the DOSP, 832 officers, yields an additional annual cost of $698,880 for the Navy Personnel Command.

D. POTENTIAL IMPACT ON RETENTION

A financially quantifiable benefit of retention is the avoidance of replacement costs. The requirement to commission an officer lowers for every officer that does not resign or lateral transfer away from the Surface Warfare Officer community. Consequently, the need to train and qualify new 111X officers is also reduced. Accession costs, $118,037 per officer summed with training costs under the "Sea to SWOS" training initiative, $102,665 per 111X, yields a result of $220,702 in replacement costs avoided per officer retained.

If the 9 YCS VS: 3 YCS retention rate improves by 1.0% (8 more officers retained per year), $1,765,616 in reduced replacement costs per year can be realized. If the 9 YCS VS: 3 YCS retention rate rises from 25.1%, the average 9 YCS VS: 3 YCS retention rate since 1987, to 28.0%, the minimum rate stated by the Surface Warfare Community Manager to fill SWO at-sea department head billets, a 2.9% improvement (24 more officers retained per year), $5,296,848 in reduced replacement costs can be realized. If the 9 YCS VS: 3 YCS retention rate returns to 29.5%, the 25-year historical retention average, a 4.4% improvement (37 more officers retained per year), $8,165,974 in reduced replacement costs can be realized.

E. RETURN ON INVESTMENT

1. Sensitivity Analysis Using 9 YCS VS: 3 YCS Retention Rates

From Chapter IV, the projected ROI based on the average 9 YCS VS: 3 YCS retention rate since 1987 (25.1% +/- 2.7%), from FY 2003 to FY 2009 is 44.2%. If the "Sea to SWOS" transformation does not improve the retention of junior Surface Warfare Officers, the annual ROI is still a 1.9% improvement over the 42.3% ROI achieved under the current DOSP.

Based on the 25-year average 9 YCS VS: 3 YCS retention rate (29.5% +/- 5.7%), the forecasted average ROI from FY 2003 to FY 2009 is 52.0%, a 9.7% improvement over the 42.3% ROI achieved under the current DOSP, a substantial improvement to ROI. If the "Sea to SWOS" training initiative raises retention rates by 4.4% (25.1% to 29.5%) back to their 25-year historical average, the annual ROI improves by more than twice the improvement in retention (4.4% improvement in 9 YCS VS: 3 YCS retention rate yields a 9.7% improvement in ROI).

Based on the 9 YCS VS: 3 YCS retention rate developed by the Surface Warfare Officer Community Manager to meet SWO afloat department head billets (33.0% +/- 5.0%), the projected average ROI from FY 2003 to FY 2009 is 58.1%. If the "Sea to SWOS" transformation raises junior Surface Warfare Officer retention to levels projected by the Surface Warfare Officer Community Manager as necessary to fill SWO afloat department head billets, the annual ROI is 15.8% greater than the 42.3% ROI achieved under the current DOSP, a significant improvement to ROI. If the "Sea to SWOS"

training initiative improves retention rates by 7.9% (25.1% to 33.0%), ROI improves by twice the improvement in retention (7.9% improvement in 9 YCS VS: 3 YCS retention rate yields a 15.8% improvement in ROI).

2. Analysis of Return on Investment Equation

From a macro perspective there are two methods to improve ROI: 1) decrease the denominator of the ROI equation by lowering investment costs, or 2) increase the numerator of the ROI equation by increasing financial benefits.

$$(3)\ ROI_i = \frac{[(\text{Accession Costs Avoided} + 111X_i - \text{SWOCP}) * (\text{Officers Retained})]}{[111X_i * (116\text{Xs Accessed})]}$$

Either decreasing the cost to train an 111X or decreasing the number of 116Xs accessed can decrease total investment costs. Increasing the number of officers retained or increasing replacement costs (accession and training costs) avoided will increase the overall financial benefits. The 'SWOCP' term, set at $50,000, is not alterable without an act of Congress.

F. IMPACT ON SHIPBOARD MANNING

The "Sea to SWOS" training initiative reduces the amount of classroom time at SWOS from 17 weeks (two core phases of SWOSDOC) to a maximum of five weeks, a 70.6% (12-week) reduction in classroom time that 116Xs would now spend on ships. The decrease in classroom training time and corresponding increase in time spent onboard ships would at first, lead to an increase in shipboard manning of 1.12 officers [(832 officers * (12 weeks gained / 52 weeks per year)) / 172 ships] on average. Wardrooms would receive an initial surge of new additions under the "Sea to SWOS" transformation due to changes in the DOSP, while 111Xs that qualified under the previous DOSP remained onboard. As a result, the distribution of collateral duties and administrative tasks normally assigned to 116Xs would initially be more widespread due to a greater pool of officers. This will decrease the workload for each 116X onboard and frees more time for them to complete the anticipated 466 additional hours of shipboard training required to complete CBT, at least for the initial group of "Sea to SWOS" 116Xs.

However, these gains in officer manning will be lost when the final cohort of 111Xs that qualified under the previous DOSP transfers to their second ship, bringing wardroom manning back to normal levels. Wardroom manning will be strained when OOD (Underway) qualified 116Xs are sent TDY to T-SWOS for a 3-5 week period effectively reducing wardroom manning by .47 officers on average [(832 officers * (5 weeks TDY / 52 weeks per year)) / 172 ships]. While 116Xs attend T-SWOS, other members of the wardroom and the Chief Petty Officer Mess would pay an opportunity cost in lost time. Other members of the ship's wardroom would have to fill their watchstations, while Chief Petty Officers would most likely bear the administrative burden and leadership mantle of shipboard divisions while 116Xs attend T-SWOS.

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VI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

1. Surface Warfare Officer Qualification Costs

The cost to qualify a Surface Warfare Officer under the current DOSP is $99,143 per officer in FY 2003 dollars assuming 17 months (average amount of time to qualify as an 111X based on SWOSCOLCOM Study of YG 1998) of shipboard training time. The cost to qualify a Surface Warfare Officer under the "Sea to SWOS" training initiative is $102,665 per officer in FY 2003 dollars including curriculum development costs and assuming 17 months of shipboard training time (projected maximum amount of time required to qualify as an 111X), $3,522 per officer more than under the current DOSP. This cost comparison assumes that CBT is equivalent or better in quality to SWOSDOC's formalized classroom training and that BOLTC and BST transferred to FCAs is equivalent in cost and quality to courses of instruction taught at SWOSCOLCOM in Newport.

2. Impact on Shipboard Manning

When the "Sea to SWOS" initiative takes effect, there will be an initial surge of 1.12 officers per ship on average due to changes in the DOSP. Wardroom manning will return to normal when the final cohort of 111Xs that qualified under the previous DOSP transfer off the ship.

Wardroom manning will decrease when OOD (Underway) qualified 116Xs are sent TDY to T-SWOS for a 3-5 week period effectively reducing wardroom manning by .47 officers per ship [(832 officers * (5 weeks TDY / 52 weeks per year)) / 172 ships] on average. Other members of the ship's wardroom would have to fill their watchstations, while Chief Petty Officers would most likely bear the administrative burden and leadership mantle of shipboard divisions while 116Xs attend T-SWOS. The size of a ship's wardroom will dictate the magnitude of the impact of the surge and drop in officer manning.

3. Projected Return on Investment

The current DOSP yields an average ROI of 42.3%. As 9 YCS VS: 3 YCS retention rates improve, the ROI improves by over twice the amount that retention rates improve. If the 9 YCS VS: 3 YCS retention rate does not change considerably from the retention rates since 1987, there is still a 44.2% projected ROI after incorporating the costs to revise the training curriculum, a 1.9% marginal increase on the ROI under the current DOSP. If the 9 YCS VS: 3 YCS retention rate climbs back to the 25-year historical average from the retention rate since 1987, from 25.1% to 29.5%, the ROI climbs to 52.0%, a 9.7% substantial improvement. Based on the 9 YCS VS: 3 YCS retention rate goals set by the Surface Warfare Officer Community Manager based on SWO at-sea department head billets, from 25.1% to 33.0%, a 7.9% improvement from the retention rate since 1987, the forecasted ROI is 58.1%, a 15.8% significant improvement in ROI. In all cases, the "Sea to SWOS" initiative achieves a greater ROI over the current the DOSP given that the 9 YCS VS: 3 YCS retention rates improves or at worst remains consistent with the retention rate since 1987.

4. Long Term Costs

The long term costs associated with the "Sea to SWOS" training initiative include $53.0 million from FY 2003 through FY 2009 to reengineer SWOS to implement the "SWOS Train to Qualify" initiative. This figure divided by seven years yields an average annual implementation cost of $7.57 million incurred by SWOSCOLCOM. These costs were a factor in calculating training costs for developing the *Crystal Ball* simulation model for projected ROI from FY 2003 through FY 2009.

The costs incurred for an 116X while participating in CBT onboard the ship is $17,276 in FY 2003 dollars. This cost per 116X multiplied by the average number in a YG's inventory at the 3 YCS mark since 1995, the first year of the DOSP, 832 officers, yields an annual increase of $14,373,632 in additional shipboard training costs that were not incurred under the current DOSP by an officer working towards qualifying as a SWO.

The long term costs associated with the "Sea to SWOS" training transformation include expenses realized by permanently transferring officers once and then sending

them TDY to T-SWOS after reporting onboard their ship instead of permanently changing station twice under the current DOSP. The cost to PCS an officer once, $3,879, plus the TDY variable figured in Chapter III, $4,719 equals $8,598, a difference of $840 per officer when compared to the PCS costs of two moves under the current DOSP. This difference multiplied by the average number in a YG's inventory at the 3 YCS mark since 1995, the first year of the DOSP, 832 officers, yields an additional annual costs of $698,880 for the Navy Personnel Command.

5. Long Term Savings

Under the "Sea to SWOS" transformation, 116Xs attend Tailored SWOS (T-SWOS) for 3-5 weeks after earning their OOD (Underway letters) and completing shipboard CBT. As figured in Chapter III, the projected cost per equivalent graduate to attend T-SWOS for 5 weeks is $13,675 in FY 2003 dollars, a difference of $18,045 per equivalent graduate over 12 less weeks when compared to the current curriculum at SWOSDOC. This statistic multiplied by the average number in a YG's inventory at the 3 YCS mark since 1995, the first year of the DOSP, 832 officers, yields an annual savings of $15,013,440 for SWOSCOLCOM.

6. Most Costly BST Tracks

Examining Appendix B, first tour BST tracks costs by ship class, clearly shows that the Damage Control Assistant and Information Systems/Communications Officer BST are the most costly BST tracks across all ship classes. The cost of sending an officer through the Damage Control Assistant BST track is $14,261 ($17,931 for those that have the Basic AEGIS Officer Console Operator course of instruction embedded in their pipeline). An officer going through the Information Systems/Communications Officer BST track incurs a cost of $17,237 ($20,907 for those that have the Basic AEGIS Officer Console Operator course of instruction embedded in their pipeline). Both BST tracks are seven weeks long, excluding the two-week long Basic AEGIS Officer Console Operator course of instruction. 116Xs under the "Sea to SWOS" initiative would incur an opportunity cost in lost shipboard training time while attending BST.

7. Potential Impact on Retention

If retention improves, the need to train and qualify new 111X replacements decreases. Accession costs, $118,037 per officer summed with training costs under the "Sea to SWOS" training initiative, $102,665 per 111X, yields a result of $220,702 in replacement costs avoided per officer retained. If the 9 YCS VS: 3 YCS retention rate improves by 1.0% (8 more officers retained per year), $1,765,616 in reduced replacement costs per year can be realized. If the 9 YCS VS: 3 YCS retention rate rises from 25.1%, the average 9 YCS VS: 3 YCS retention rate since 1987, to 28.0%, the minimum rate stated by the Surface Warfare Community Manager to fill SWO at-sea department head billets, a 2.9% improvement (24 more officers retained per year), $5,296,848 in reduced replacement costs can be realized. If the 9 YCS VS: 3 YCS retention rate returns to 29.5%, the 25-year historical retention average, a 4.4% improvement (37 more officers retained per year), $8,165,974 in reduced replacement costs per year can be realized.

8. Summary

There are many concerns expressed by the fleet's wardrooms concerning the "Sea to SWOS" training initiative. The lack of upfront formal training received by newly commissioned officers when arriving at their first ship will affect their ability to immediately contribute to mission readiness. The quality of unproven SWO Computer Based Training (CBT), increased workload to the ship, and loss of leadership while officers are on temporary duty (TDY) for three to five weeks of training at Newport, RI, for finishing and leveling school training were other apprehensions voiced. The execution of the "Sea to SWOS" transformation will require a major change in previous mindsets. Afloat leadership must accept that these officers will take longer to adapt to their new environment.

However, based on the quantitative and qualitative data analyzed, the Surface Warfare Officer leadership's decision to implement the "Sea to SWOS" training initiative is a positive step in the right direction towards improving the culture of the community. First-tour division officer experiences should become more positive through earlier SWO attainment and increased officer personnel readiness, ultimately leading to improved junior officer retention in the Surface Warfare Officer community.

B. SUGGESTIONS FOR IMPROVING THE "SEA TO SWOS" INITIATIVE

The "Sea to SWOS" training initiative is a positive step in the right direction towards improving the culture of the community. However, there are several concerns regarding the changes to the DOSP caused by the training transformation. The lack of formal training received by newly commissioned officers when arriving on their first ship and increased workload to the ship and loss of leadership while officers attend BST in FCAs and T-SWOS in Newport, are of great concern to the waterfront. These suggestions, if taken, should increase the probability of success for 116Xs qualifying under this initiative.

1. Improve Knowledge and Skill Sets of Prospective 116Xs Before Commissioning

a. Improve Classroom Training at the Commissioning Source

116Xs under the "Sea to SWOS" training initiative, reporting onboard their first ship, have a decreased knowledge and skill set when compared to 116Xs under the current DOSP since they will not have the luxury of 6 months of formalized schoolhouse training at SWOSDOC. If classroom training at commissioning sources covered more material relevant to the SWO qualification process, the knowledge and skill set of newly commissioned 116Xs would improve.

For example, prospective junior Surface Warfare Officers during the second semester of their senior year of college or final weeks of Officer Candidate School could cover training modules not dependent on the shipboard environment, but relevant to the SWO qualification such as division officer administration, message writing, and training and readiness, which includes the 3-M (Maintenance Material Management) system. 116Xs would be more likely to make a positive contribution to their first commands more quickly because they would have greater knowledge and skills and improved abilities. This would increase the opportunity cost for Midshipmen entering the Surface Warfare Officer community by adding to their academic and professional workload, but the long-term consequences of increasing their knowledge, skills, and abilities before entering the fleet could certainly be beneficial for the officer and their future Commanding Officer. This would have the effect of reducing the amount

of pre-OOD training time required to qualify as OOD (Underway), based on their higher skill sets, thus lowering the cost of training junior Surface Warfare Officers.

Another approach would be to deliver non-shipboard dependent CBT modules to midshipmen selecting Surface Warfare in their senior year of college or final weeks of Officer Candidate School. These CBT modules, incorporated into the classroom curriculum of commissioning sources, would, ultimately, decrease the amount of CBT that needed to be completed once an 116X reported aboard their first command and also has the effect of reducing the amount of pre-OOD training time required to qualify as OOD (Underway) as well. This would also increase the opportunity cost for entering the community as well, by adding to their academic and professional workload. However, the long-term benefit for the officer and future Commanding Officer reaped in increased knowledge, skills, and abilities should outweigh the time invested by the officer and trainers at the commissioning source.

b. Leverage Shipboard Experience of Midshipmen Cruises

Midshipmen at the United States Naval Academy and Reserve Officer Training Corps Units participate in summer cruises. If the building blocks for SWO PQS qualification, such as Basic Damage Control, Officer of the Deck (In-port), and Small Boat Officer were mandatory for all midshipmen, which includes prospective 116Xs on these cruises, it would reduce the number of PQS qualifications an 116X would have to complete after reporting to their first ship as a commissioned officer. At a minimum, the amount of time needed to qualify as a SWO would decrease, since a 116X would only have to requalify at a new unit under the auspices of their new Commanding Officer on a previously completed PQS, which is a less arduous process than completing a PQS from scratch. This would also serve to reduce the amount of 'PRE-OOD TRAINING' cost by saving time. Midshipmen and the personnel charged with their training during their cruises incur an opportunity cost through lost time. However, the long-term benefit for the officer and future Commanding Officer reaped in increased knowledge, skills, and abilities outweigh the time invested by the officer and their trainers on midshipman summer cruises.

Mandatory qualification for midshipmen not considering Surface Warfare would facilitate some future officers to reconsider their service selection options after going through this qualification process.

2. Transfer Damage Control Assistant and Information Systems/ Communications Officer BST Tracks to Second Tour Division Officers or Limited Duty Officers

Under the current DOSP, 116Xs attend Billet Specialty Training (BST), upon completion of SWOSDOC in Newport, to prepare them for the jobs they will hold on their first ship. 116Xs finish all formal training to perform duties specified by their assigned billets before reporting aboard, thus not influencing the length of time onboard their first ship.

However, under the "Sea to SWOS" training transformation, Commanding Officers would send 116Xs on TDY to FCAs near their homeports if they desire 116Xs to complete BST, presumably similar to courses of instruction they would have taken in Newport. They will decide what BST an 116X will receive and when they will take it, however an 116X's time spent TDY to attend BST would count against their 27-month tour length onboard.

It would be prudent to consider transferring some billets that are not time and cost effective for first tour division officers and their commands to second tour division officers or limited duty officers, who would receive this BST training en route to their ship. The Damage Control Assistant and Information Systems/Communications Officer BST track are the least time and cost effective Billet Specialty Training track across all platforms by a considerable margin. Transfer of these billets to second-tour division officers deserves serious consideration. If these billets were a second-tour division officer or limited duty officer billet, an officer filling one of these billets would receive training enroute instead of the receiving command having to send this officer TDY to receive BST.

3. Convert First Tour Division Officer BST to Shipboard CBT Over Transferring BST to FCAs

Senior SWO leadership has made the decision to suspend first-tour division officer BST training in Newport and use the cost savings (not factored into the training

reengineering cost at SWOSCOLCOM) to relocate courses to FCAs or develop interactive course to replace BST. This thesis recommends allocating all costs saved by suspending BST towards developing interactive courseware to replace BST. The implementation of CBT to replace BST would significantly reduce the amount of TDY 116Xs would have to spend off the ship to learn the knowledge and skills, to perform their duties.

In addition, developing CBT to provide 116Xs the knowledge, skills, and abilities to perform their respective jobs on their ships would be more consistent with the "Sea to SWOS" training initiative than transferring BST from Newport to FCAs. Although transferring BST from Newport to FCAs would place BST closer to ships, thus reducing the amount of TDY cost to train 116Xs, shipboard time, counting against the 116X's 27-month allotted stay onboard, would be lost. This lost time would show-up in increased 'PRE-OOD TRAINING' costs, since it would take longer for 116Xs to qualify since they would be off the ship. The implementation of shipboard CBT to replace BST would give Commanding Officers and 116Xs greater flexibility in time allocation.

116Xs would still incur an opportunity cost in lost time while participating in CBT however, they and their Commanding Officer would gain greater flexibility. 116Xs could participate in CBT on a not-to-interfere basis with their watchstanding and primary duties.

4. Reduce POST-OOD TRAINING Period by Scheduling Mandatory SWO Qualifications Boards Within a Fixed Periodicity

Notionally, under the "Sea to SWOS" transformation, 116Xs should earn their SWO qualification 1-2 months after returning from T-SWOS. The variability in 'POST-OOD TRAINING' costs would be lower if SWO qualification boards were mandatory within two weeks after an 116X's return from T-SWOS.

116Xs on the verge of SWO qualification can quickly grow frustrated and disenchanted when the only thing standing between them and qualification are administrative delays based on shipboard scheduling issues. Mandatory qualification boards within a specified periodicity would ensure that scheduling an 116X's "murder"

board, an informal board led by other SWO qualified officers to test an 116X's readiness for SWO qualification, and the SWO qualification board were made shipboard priorities.

In addition, mandatory scheduling for SWO qualification boards would establish a contract of "good faith" between the command and an 116X. If this contract (specified in Surface Warfare Officer Qualification and Designation guidance) with 116Xs on the verge of qualification were violated on a consistent basis, it would send a message that there are prioritization issues at the command. Mandatory scheduling may initially appear to be a micromanagement tool, however the benefits of implementing the policy can align an individual command's priorities with those of the community as a whole.

Retention of junior Surface Warfare Officers, which influences overall readiness, remains the number one priority of the community. Based on the 2001 junior Surface Warfare Officer Survey, 38 percent of junior Surface Warfare Officers who planned to leave active duty made their decision during their first at-sea division officer tour where their SWO qualification experience plays a significant factor. If the command negatively affects their experience, retention results may suffer, despite the best efforts of SWO leadership to transform the qualification process. Statistical data on implementation of mandatory scheduling for SWO boards policy should be easy to track by comparing officers' T-SWOS graduation date with SWO qualification date.

C. RECOMMENDED AREAS OF FURTHER STUDY

The "Sea to SWOS" training initiative will make an indelible mark on the SWO qualification process. If successful, this transformation will alter the delivery of training to the waterfront. This research exposed other issues exposed relevant to the Surface Warfare Officer career path that merit exploration.

1. Finishing and Leveling School for EOOW

In order to earn Command at Sea, a Surface Warfare Officer must earn three major shipboard qualifications, Surface Warfare Officer Qualification, Engineering Officer of the Watch (EOOW), and Tactical Action Officer (TAO). Mandatory formal schoolhouse training exists for Surface Warfare Officer qualification through T-SWOS and TAO through the eight-week long Tactical Action Officer/Watch Officer course, administered as part of the SWO Department Head course of instruction. However, no

formal schoolhouse training exists for prospective EOOWs. The concept of developing a finishing and leveling school for EOOWs in Newport and/or FCAs to standardize shipboard training methodologies and quality is worthy of exploration.

2. CBT for Non-TAO Portion of SWO Department Head School

The idea of implementing CBT to replace SWOSDOC could reduce the length of the six-month long SWO Department Head course of instruction, thus minimizing the amount of time an officer is away from the shipboard environment. Some aspects of Department Head training demand a formal academic environment, like Tactical Action Officer training, but there are other sections of Department Head school that are conducive to CBT, like the Shipboard Readiness and Training Curriculum, which accounts for 90 hours of classroom instruction. The use of shipboard CBT at the SWO Department Head course of instruction or even higher levels of professional pipeline education is worth examination.

3. Impact of Mandatory Warfare Qualification for LDOs

This thesis calculated the costs of qualifying an 116X commissioned from either the United States Naval Academy, Reserve Officer Training Corps, or Officer Candidate School as a Surface Warfare Officer. However, calculations did not include the impact of Limited Duty Officers, because warfare qualification is beneficial, but not mandatory, in their career pipeline. The Surface Warfare Officer community could leverage Limited Duty Officers unique knowledge, skills, and abilities to fill specific first and second-tour division officer billets. However, the Surface Warfare Officer community most likely would not relinquish these billets, unless these Limited Duty Officers were qualified as Surface Warfare Officers. It would be interesting to speculate what impact mandatory warfare qualification would have on limited duty officer accessions.

4. Quality of CBT VS: Quality of Classroom Training

This thesis assumed that the quality of CBT would meet or exceed the quality of instruction at SWOSDOC. This is highly speculative since the "Sea to SWOS" transformation has not started; officers commissioned in December 2002 will be the first group to participate in this transformation. The more aggressive members of first cohort of 116Xs should qualify as Surface Warfare Officers on or around September 2003 (eight

months from reporting aboard their first ship). The vast majority of officers from the first cohort should earn their 111X designator as Surface Warfare Officers around August 2004 (seventeen months from reporting aboard their first ship). A study comparing the knowledge, skills, and abilities of these 111X officers versus the 111X officers qualified under the DOSP in effect before the "Sea to SWOS" transformation would be sensible.

5. Impact of the "Sea to SWOS" Training Initiative on the Workload of 116Xs and Officers Responsible for Their Training

Ships' wardrooms will have a dramatically increased role in training and mentoring 116Xs under the "Sea to SWOS" training initiative. A study on the impact this initiative has on the workload of 116Xs, besides the 466 hours needed to complete CBT, and on the officers responsible for their training, particularly Senior Watch Officers, merits exploration.

6. Waterfront Acceptance and Quality of the Shipboard Training Enhancement Program (STEP) and Other Existing Interactive Courseware

The Naval Education and Training Command will reactivate the AN/WRN-6 Global Positioning System course at Fleet Training Center Norfolk and San Diego by the start of FY 2004. The Shipboard Training Enhancement Program (STEP), meant to replace the AN/WRN-6 course, provided via Compact Disc to shipboard units, was "inadequate" in meeting shipboard needs [Ref. 46]. It is important to assess the quality of STEP programs currently distributed throughout the fleet, like the Damage Control Petty Officer and Ammunition Administration courses. Assessing waterfront acceptance of the STEP program and other existing interactive courseware is also important.

7. Reduction of Operating Costs at T-SWOS

The "Sea to SWOS" transformation significantly reengineers the qualification process for Surface Warfare officers. SWOSCOLCOM's operating budget will increase by $53.0 million between FY 2003 and FY 2009 to reengineer SWOS and support the "SWOS Train to Qualify" initiative. However, there has been no indication that there would be any long-term reductions in operating costs at SWOSCOLCOM, despite the shortened length of an 116X's stay in Newport. Reductions in operating expenditures at

SWOSCOLCOM would further reduce the costs to train and qualify Surface Warfare Officers.

8. Changing Demographics of Surface Warfare Officer Community and Effects on Retention

This thesis assumes that the shipboard experience of first-tour division officers, through the SWO qualification process, plays a strong role in influencing retention. The impact of changing demographics on long-term retention within the community also merits examination. For example, an increase in the percentage of prior enlisted personnel (particularly those married with over 12 years of prior enlisted service) would intuitively increase the number of officers desiring to sign up for the SWOCP and pursue early completion of Department Head tours, skewing 9 YCS VS: 3 YCS retention rates. However, these officers most likely would retire on shore duty after reaching 20 years of military (enlisted and commissioned) service, depleting officer year groups at the 9-13 YCS mark. These shortfalls would affect SWO Department Head and Executive Officer manning levels. Closely examining recent and long-term trends in the community's demographics and its effects on long-term retention is important.

APPENDIX A: SWO QUALIFICATION SAMPLE LETTER

OFFICER TRANSFER MANUAL
(NAVPERS 15559B)
Figure 9-2

From: Deputy Chief of Naval Personnel
To:
Via: Commanding Officer

Subj: QUALIFICATION AS A SURFACE WARFARE OFFICER
Ref: (a)
(b) MILPERSMAN 1210-090

1. It is a pleasure to advise you that your qualification as a Surface Warfare Officer, requested and approved in reference (a), is confirmed in accordance with the provisions of reference (b).

2. This qualification is a mark of professional achievement and identifies you as an officer who has demonstrated significant proficiency in the art of surface warfare. Your accomplishments in the demanding environment of a seagoing officer are recognized, and your effort in attaining the Surface Warfare Officer qualification is noted with pleasure.

3. The Surface Warfare qualification will become part of your official record and included on your Officer Data Card.

4. Congratulations!

(PERS-41)
By direction

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APPENDIX B FIRST TOUR BST TRACKS COSTS BY SHIP CLASS

DDG-51 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$932	$6,662	$7,594	$960	$7,408	$8,368
ASWO	$1,322	$10,400	$11,722	$1,362	$11,565	$12,926
COMMO	$3,472	$15,585	$19,057	$3,577	$17,330	$20,907
ADVANCED EOOW	$1,119	$9,020	$10,139	$1,153	$10,030	$11,183
CICO	$1,044	$7,750	$8,794	$1,076	$8,618	$9,693
STRIKE	$1,871	$17,057	$18,928	$1,927	$18,967	$20,894
DCA	$1,247	$14,970	$16,217	$1,285	$16,646	$17,931
GUNNERY	$979	$6,853	$7,832	$1,009	$7,620	$8,629
Average BST Cost			**$12,535**			**$13,816**

Table 13. DDG-51 First Tour Billet Specialty Training Track Costs

CG-47 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$932	$6,662	$7,594	$960	$7,408	$8,368
ASWO	$1,322	$10,400	$11,722	$1,362	$11,565	$12,926
COMMO	$3,472	$15,585	$19,057	$3,577	$17,330	$20,907
ADVANCED EOOW	$1,101	$9,425	$10,526	$1,134	$10,480	$11,615
CICO	$1,044	$7,750	$8,794	$1,076	$8,618	$9,693
STRIKE	$1,871	$17,057	$18,928	$1,927	$18,967	$20,894
DCA	$1,247	$14,970	$16,217	$1,285	$16,646	$17,931
GUNNERY	$979	$6,853	$7,832	$1,009	$7,620	$8,629
Average BST Cost			**$12,584**			**$13,870**

Table 14. CG-47 First Tour Billet Specialty Training Track Costs

DD-963 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$198	$4,042	$4,240	$204	$4,495	$4,699
ASWO	$588	$7,780	$8,368	$606	$8,651	$9,257
COMMO	$2,738	$12,965	$15,703	$2,821	$14,417	$17,237
ADVANCED EOOW	$367	$6,805	$7,172	$378	$7,567	$7,945
CICO	$310	$5,130	$5,440	$319	$5,704	$6,024
STRIKE	$245	$4,233	$4,478	$252	$4,707	$4,959
DCA	$513	$12,350	$12,863	$528	$13,733	$14,261
GUNNERY	$245	$4,233	$4,478	$252	$4,707	$4,959
FCO	$243	$4,618	$4,861	$250	$5,135	$5,385
Average BST Cost			**$7,511**			**$8,303**

Table 15. DD-963 First Tour Billet Specialty Training Track Costs

FFG-7 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$198	$4,042	$4,240	$204	$4,495	$4,699
ASWO	$588	$7,780	$8,368	$606	$8,651	$9,257
COMMO	$2,738	$12,965	$15,703	$2,821	$14,417	$17,237
ADVANCED EOOW	$362	$6,856	$7,218	$373	$7,624	$7,997
CICO	$310	$5,130	$5,440	$319	$5,704	$6,024
DCA	$513	$12,350	$12,863	$528	$13,733	$14,261
GUNNERY	$354	$4,751	$5,105	$365	$5,283	$5,648
Average BST Cost			**$8,420**			**$9,303**

Table 16. FFG-7 First Tour Billet Specialty Training Track Costs

LHD-1 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$198	$4,042	$4,240	$204	$4,495	$4,699
INFO SYS	$2,738	$12,965	$15,703	$2,821	$14,417	$17,237
ADVANCED EOOW	$383	$7,089	$7,472	$395	$7,883	$8,277
CICO/EWO	$310	$5,130	$5,440	$319	$5,704	$6,024
DCA	$513	$12,350	$12,863	$528	$13,733	$14,261
WEAPONS	$173	$3,011	$3,184	$178	$3,348	$3,526
Average BST Cost			**$8,150**			**$9,004**

Table 17. LHD-1 First Tour Billet Specialty Training Track Costs

LHA-1 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$198	$4,042	$4,240	$204	$4,495	$4,699
INFO SYS	$2,738	$12,965	$15,703	$2,821	$14,417	$17,237
ADVANCED EOOW	$383	$7,089	$7,472	$395	$7,883	$8,277
CICO/EWO	$310	$5,130	$5,440	$319	$5,704	$6,024
DCA	$513	$12,350	$12,863	$528	$13,733	$14,261
WEAPONS	$173	$3,011	$3,184	$178	$3,348	$3,526
Average BST Cost			**$8,150**			**$9,004**

Table 18. LHA-1 First Tour Billet Specialty Training Track Costs

AOE-1 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$932	$6,662	$7,594	$960	$7,408	$8,368
COMMO	$3,472	$15,585	$19,057	$3,577	$17,330	$20,907
ADVANCED EOOW	$1,117	$9,709	$10,826	$1,151	$10,796	$11,947
CICO	$1,044	$7,750	$8,794	$1,076	$8,618	$9,693
DCA	$1,247	$14,970	$16,217	$1,285	$16,646	$17,931
Average BST Cost			**$12,498**			**$13,769**

Table 19. AOE-1 First Tour Billet Specialty Training Track Costs

AOE-6 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$932	$6,662	$7,594	$960	$7,408	$8,368
CICO	$1,044	$7,750	$8,794	$1,076	$8,618	$9,693
Average BST Cost			**$8,194**			**$9,031**

Table 20. AOE-6 First Tour Billet Specialty Training Track Costs

LPD-4 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$198	$4,042	$4,240	$204	$4,495	$4,699
INFO SYS	$2,738	$12,965	$15,703	$2,821	$14,417	$17,237
ADVANCED EOOW	$383	$7,089	$7,472	$395	$7,883	$8,277
CICO/EWO	$310	$5,130	$5,440	$319	$5,704	$6,024
DCA	$513	$12,350	$12,863	$528	$13,733	$14,261
WEAPONS	$173	$3,011	$3,184	$178	$3,348	$3,526
Average BST Cost			**$8,150**			**$9,004**

Table 21. LPD-4 First Tour Billet Specialty Training Track Costs

LSD-36 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$198	$4,042	$4,240	$204	$4,495	$4,699
INFO SYS	$2,738	$12,965	$15,703	$2,821	$14,417	$17,237
ADVANCED EOOW	$383	$7,089	$7,472	$395	$7,883	$8,277
CICO/EWO	$310	$5,130	$5,440	$319	$5,704	$6,024
DCA	$513	$12,350	$12,863	$528	$13,733	$14,261
WEAPONS	$173	$3,011	$3,184	$178	$3,348	$3,526
Average BST Cost			**$8,150**			**$9,004**

Table 22. LSD-36 First Tour Billet Specialty Training Track Costs

LSD-41 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$198	$4,042	$4,240	$204	$4,495	$4,699
INFO SYS	$2,738	$12,965	$15,703	$2,821	$14,417	$17,237
ADVANCED EOOW	$334	$6,712	$7,046	$344	$7,464	$7,808
CICO/EWO	$310	$5,130	$5,440	$319	$5,704	$6,024
DCA	$513	$12,350	$12,863	$528	$13,733	$14,261
WEAPONS	$173	$3,011	$3,184	$178	$3,348	$3,526
EMO	$160	$3,244	$3,404	$165	$3,607	$3,772
Average BST Cost			**$7,411**			**$8,190**

Table 23. LSD-41 First Tour Billet Specialty Training Track Costs

MCM-1 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
DCA	$1,247	$14,970	$16,217	$1,285	$16,646	$17,931
COMMO	$3,472	$15,585	$19,057	$3,577	$17,330	$20,907
Average BST Cost			**$17,637**			**$19,419**

Table 24. MCM-1 First Tour Billet Specialty Training Track Costs

LCC-19 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$198	$4,042	$4,240	$204	$4,495	$4,699
INFO SYS	$2,738	$12,965	$15,703	$2,821	$14,417	$17,237
ADVANCED EOOW	$383	$7,089	$7,472	$395	$7,883	$8,277
CICO/EWO	$310	$5,130	$5,440	$319	$5,704	$6,024
DCA	$513	$12,350	$12,863	$528	$13,733	$14,261
WEAPONS	$173	$3,011	$3,184	$178	$3,348	$3,526
Average BST Cost			**$8,150**			**$9,004**

Table 25. LCC-19 First Tour Billet Specialty Training Track Costs

AGF-3/11 First Tour BST Tracks	OMN Cost (FY01$)	MPN Cost (FY01$)	Cost Per Grad (FY01$)	OMN Cost (FY03$)	MPN Cost (FY03$)	Cost Per Grad (FY03$)
FIRST LT	$198	$4,042	$4,240	$204	$4,495	$4,699
INFO SYS	$2,738	$12,965	$15,703	$2,821	$14,417	$17,237
ADVANCED EOOW	$383	$7,089	$7,472	$395	$7,883	$8,277
CICO/EWO	$310	$5,130	$5,440	$319	$5,704	$6,024
DCA	$513	$12,350	$12,863	$528	$13,733	$14,261
WEAPONS	$173	$3,011	$3,184	$178	$3,348	$3,526
Average BST Cost			**$8,150**			**$9,004**

Table 26. AGF-3/11 First Tour Billet Specialty Training Track Costs

APPENDIX C: DON COMPOSITE STANDARD PAY AND REIMBURSEMENT RATES, FY 2003

MILITARY PAY GRADE	AVERAGE BASIC PAY	ANNUAL DOD COMPOSITE RATE[1/]	ANNUAL RATE BILLABLE TO OTHER FEDERAL AGENCIES[2/]
0-10	$133,023	$202,581	$214,736
0-9	$129,424	$197,795	$209,663
0-8	$121,041	$185,932	$197,088
0-7	$107,222	$171,330	$181,610
0-6	$90,491	$158,836	$168,366
0-5	$72,771	$135,730	$143,874
0-4	$61,237	$121,521	$128,812
0-3	$50,084	$104,896	$111,190
0-2	$39,730	$82,670	$87,630
0-1	$29,890	$67,406	$71,450
WO-5	----	----	----
WO-4	$59,669	$109,318	$115,877
WO-3	$50,409	$95,202	$100,914
WO-2	$42,645	$84,161	$89,211
WO-1	----	----	----
E-9	$51,869	$98,112	$108,904
E-8	$42,641	$84,523	$93,821
E-7	$37,250	$75,867	$84,212
E-6	$30,652	$65,864	$73,109
E-5	$24,379	$55,858	$62,002
E-4	$19,513	$46,546	$51,666
E-3	$16,357	$39,061	$43,358
E-2	$15,287	$36,323	$40,319
E-1	$12,906	$32,217	$35,761

Notes: 1/ The annual DOD composite rate includes the following military personnel appropriation costs: average basic pay plus retired pay accrual, medical health care accrual, basic allowance for housing, basic allowance for subsistence, incentive and special pay, permanent change of station and miscellaneous pay.

2/ The annual rate billable to Other Federal Agencies recovers additional military related health care costs financed by the Defense Health Program. The annual billable rate includes an acceleration factor of 6 percent for officers and 11 percent for enlisted personnel.

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APPENDIX D: TRANSPORTATION COSTS

Homeports:	Miles to Newport, RI	Total Roundtrip Distance in Miles	TAD Mileage Rate	Roundtrip POV Costs
Norfolk, VA	539.4	1078.8	$0.365	$393.76
Mayport, FL	1123.8	2247.6	$0.365	$820.37
Pascagoula, MS	1431.5	2863.0	$0.365	$1,045.00
Ingleside, TX	2006.2	4012.4	$0.365	$1,464.53
San Diego, CA	3033.2	6066.4	$0.365	$2,214.24
Everett, WA	3049.1	6098.2	$0.365	$2,225.84
Pearl Harbor, HI	N/A	N/A	N/A	N/A
Yokosuka, Japan	N/A	N/A	N/A	N/A
Sasebo, Japan	N/A	N/A	N/A	N/A
Gaeta, Italy	N/A	N/A	N/A	N/A
Manama, Bahrain	N/A	N/A	N/A	N/A

Table 27. Roundtrip POV Costs from Homeport to T-SWOS [Ref. 32, 33]

Homeports:	Origin Airport	Destination Airport	Gov't One Way Fares	Total Round Trip Cost
Norfolk, VA	Norfolk, VA	Providence, RI	$99	$198
Mayport, FL	Jacksonville, FL	Providence, RI	$99	$198
Pascagoula, MS	Mobile, AL	Providence, RI	$262	$524
Ingleside, TX	Houston, TX	Boston, MA	$171	$342
San Diego, CA	San Diego, CA	Providence, RI	$175	$350
Everett, WA	Seattle, WA	Providence, RI	$175	$350
Pearl Harbor, HI	Honolulu, HI	Boston, MA	$328	$656
Yokosuka, Japan	Tokyo, Japan	Providence, RI	$300	$600
Sasebo, Japan	Tokyo, Japan	Providence, RI	$300	$600
Gaeta, Italy	Rome, Italy	Providence, RI	$398	$796
Manama, Bahrain*	Bahrain, Bahrain	Providence, RI	$1,334	$2,668

Table 28. Roundtrip Air Fares Utilizing One-Way Government Charter Rates from Homeport's Closest Airport Directly to Closest Major Airport to Newport, RI [Ref. 33]

***NOTE:** Flights originating from Bahrain, where the government rate is applicable, only land in Detroit ($1,011). The additional $323 reflects the cost of a flight from Detroit to Providence.

Homeports:	Roundtrip POV Costs	Total Air Fare Costs	Max. Rental Car Costs	Rental and Air Costs	POV Over Fly	Within 1,560 Miles
Norfolk, VA	$393.76	$198	$1,575	$1,773	**Y**	**Y**
Mayport, FL	$820.37	$198	$1,575	$1,773	**Y**	**Y**
Pascagoula, MS	$1,045.00	$524	$1,575	$2,099	**Y**	**Y**
Ingleside, TX	$1,464.53	$342	$1,575	$1,917	**Y**	N
San Diego, CA	$2,214.24	$350	$1,575	$1,925	N	N
Everett, WA	$2,225.84	$350	$1,575	$1,925	N	N
Pearl Harbor, HI	N/A	$656	$1,575	$2,231	N	N
Yokosuka, Japan	N/A	$600	$1,575	$2,175	N	N
Sasebo, Japan	N/A	$600	$1,575	$2,175	N	N
Gaeta, Italy	N/A	$796	$1,575	$2,371	N	N
Manama, Bahrain	N/A	$2,668	$1,575	$4,243	N	N

Table 29. Comparison of Roundtrip Costs VS: Roundtrip Air and Rental Costs Originating from Same Homeports

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