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**NAVAL  
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**MONTEREY, CALIFORNIA**

**THESIS**

**YOU ONLY GET ONE CHANCE TO MAKE A FIRST  
IMPRESSION: A QUANTITATIVE ANALYSIS OF  
DIVISION OFFICER FLEET EXPERIENCES ON  
SURFACE WARFARE OFFICER RETENTION**

by

Andrew Thompson Roy

March 2007

Thesis Co-Advisors:

William Bowman  
Alice Crawford

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**YOU ONLY GET ONE CHANCE TO MAKE A FIRST IMPRESSION: A  
QUANTITATIVE ANALYSIS OF DIVISION OFFICER FLEET EXPERIENCES  
ON SURFACE WARFARE OFFICER RETENTION.**

Andrew T. Roy  
Lieutenant, United States Navy  
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Submitted in partial fulfillment of the  
requirements for the degree of

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## **ABSTRACT**

This thesis utilizes Bureau of Naval Personnel data to examine the determinants of Surface Warfare Officer retention through the department head decision point in Year Groups 1993-1997. The retention model includes demographic and background variables in order to isolate the effects of variables that serve as proxies for job satisfaction: initial homeport, initial ship type, and initial shipboard department. Logit modeling illustrates that the following characteristics improve an officer's chance of remaining in the Surface Navy: male, married or divorced with children, prior enlisted, Officer Candidate School officer, biological sciences major, Year Group 1996, initial homeport of Norfolk or Little Creek, and transferred from a non-cruiser/destroyer (CRUDES) ship to a CRUDES ship during the division officer tours. Conversely, officers with these characteristics are least likely to continue their careers in the Surface Navy: female, single without children, not prior enlisted, Naval Academy or Reserve Officer Training Corps graduate, business or economics major, Year Group 1993 or 1994, initial homeport in the Pacific Northwest, and no CRUDES experience. The thesis recommends that the Navy should examine the retention issue not only in monetary terms but also with emphasis on the influence an officer's fleet experiences have on his or her stay/leave decision.



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# TABLE OF CONTENTS

|             |   |           |
|-------------|---|-----------|
| <b>I.</b>   | <b>INTRODUCTION.....</b>                              | <b>1</b>  |
| <b>A.</b>   | <b>BACKGROUND .....</b>                               | <b>1</b>  |
| <b>B.</b>   | <b>SCOPE OF THE THESIS.....</b>                       | <b>2</b>  |
| <b>C.</b>   | <b>METHODOLOGY .....</b>                              | <b>3</b>  |
| <b>II.</b>  | <b>LITERATURE REVIEW .....</b>                        | <b>5</b>  |
| <b>A.</b>   | <b>INTRODUCTION TO RETENTION MODELING .....</b>       | <b>5</b>  |
| <b>B.</b>   | <b>JOB SATISFACTION.....</b>                          | <b>6</b>  |
| <b>1.</b>   | <b>Job Performance .....</b>                          | <b>8</b>  |
| <b>2.</b>   | <b>Quality of Leadership.....</b>                     | <b>10</b> |
| <b>C.</b>   | <b>HUMAN CAPITAL FACTORS.....</b>                     | <b>12</b> |
| <b>1.</b>   | <b>SWOCP Study (1996) .....</b>                       | <b>13</b> |
| <b>2.</b>   | <b>SWOCP Study (2002) .....</b>                       | <b>14</b> |
| <b>D.</b>   | <b>PREVIOUS SWO RETENTION STUDIES .....</b>           | <b>15</b> |
| <b>1.</b>   | <b>Bautista (1996).....</b>                           | <b>16</b> |
| <b>2.</b>   | <b>Johnson (1998).....</b>                            | <b>17</b> |
| <b>3.</b>   | <b>Duffy (2000) .....</b>                             | <b>18</b> |
| <b>E.</b>   | <b>CHAPTER SUMMARY.....</b>                           | <b>19</b> |
| <b>III.</b> | <b>DATA AND METHODOLOGY .....</b>                     | <b>21</b> |
| <b>A.</b>   | <b>DATA .....</b>                                     | <b>21</b> |
| <b>B.</b>   | <b>METHODOLOGY .....</b>                              | <b>21</b> |
| <b>C.</b>   | <b>VARIABLES IN THE RETENTION MODEL .....</b>         | <b>22</b> |
| <b>1.</b>   | <b>Gender.....</b>                                    | <b>23</b> |
| <b>2.</b>   | <b>Ethnic Background .....</b>                        | <b>24</b> |
| <b>3.</b>   | <b>Commissioning Source .....</b>                     | <b>24</b> |
| <b>4.</b>   | <b>Undergraduate Major .....</b>                      | <b>25</b> |
| <b>5.</b>   | <b>Dependent Status .....</b>                         | <b>26</b> |
| <b>6.</b>   | <b>Prior-Enlisted Status .....</b>                    | <b>26</b> |
| <b>7.</b>   | <b>Year Group.....</b>                                | <b>27</b> |
| <b>8.</b>   | <b>Initial Homeport.....</b>                          | <b>27</b> |
| <b>9.</b>   | <b>CRUDES Experience.....</b>                         | <b>28</b> |
| <b>10.</b>  | <b>Initial Department .....</b>                       | <b>31</b> |
| <b>D.</b>   | <b>CHAPTER SUMMARY.....</b>                           | <b>32</b> |
| <b>IV.</b>  | <b>RESULTS AND ANALYSIS .....</b>                     | <b>35</b> |
| <b>A.</b>   | <b>STAYSWO REGRESSION RESULTS .....</b>               | <b>35</b> |
| <b>1.</b>   | <b>Influence of Control Variables .....</b>           | <b>37</b> |
| <b>2.</b>   | <b>Influence of Major Independent Variables .....</b> | <b>38</b> |
| <b>B.</b>   | <b>LATOUT REGRESSION RESULTS .....</b>                | <b>42</b> |
| <b>C.</b>   | <b>CHAPTER SUMMARY.....</b>                           | <b>45</b> |
| <b>V.</b>   | <b>CONCLUSION .....</b>                               | <b>47</b> |
| <b>A.</b>   | <b>MAJOR FINDINGS OF THE RESEARCH .....</b>           | <b>47</b> |

|           |   |           |
|-----------|---|-----------|
| <b>B.</b> | <b>LIMITATIONS OF THE RESEARCH.....</b>               | <b>49</b> |
| <b>C.</b> | <b>RECOMMENDATIONS FOR FURTHER RESEARCH .....</b>     | <b>49</b> |
|           | <b>APPENDIX A: INITIAL HOMEPORT FREQUENCIES .....</b> | <b>51</b> |
|           | <b>APPENDIX B: NOBC FREQUENCIES .....</b>             | <b>53</b> |
|           | <b>LIST OF REFERENCES.....</b>                        | <b>55</b> |
|           | <b>INITIAL DISTRIBUTION LIST .....</b>                | <b>61</b> |

## LIST OF FIGURES

|   |    |
|---|----|
| Figure 1. Initial Ship Assignment Analysis Summary from Literature Review ..... | 29 |
| Figure 2. Summary of Expected Influence of Variables in Retention Model .....   | 33 |
| Figure 3. Description of Dependent Variables .....                              | 33 |

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## LIST OF TABLES

|  |    |
|--|----|
| Table 1. Categorical Percentages of Variables in the Retention Model .....         | 23 |
| Table 2. Initial Homeport Descriptive Statistics.....                              | 27 |
| Table 3. Initial Ship Type Groupings, Frequencies, and Percent Within Sample ..... | 29 |
| Table 4. Navy Officer Billet Classification Code Frequencies and Groupings.....    | 32 |
| Table 5. STAYSWO Regression Results.....   | 36 |
| Table 6. LATOUT Regression Results.....  | 43 |

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## **I. INTRODUCTION**

### **A. BACKGROUND**

In light of the development of the Surface Warfare Officer Continuation Pay (SWOCP) program in FY2000, the Surface Navy has devoted considerable resources to examining the causal factors that lead to a junior officer's decision to remain in the Surface Fleet through the department head tours (Holloway, 2004). In 1996 Mackin and Darling utilized an Annualized Cost of Leaving (ACOL) model to predict the effectiveness of implementing SWOCP. Their model assumed that officers would remain in the Navy if their predicted current and future compensation in the Navy exceeded predicted compensation in the civilian sector. They also compared the cost of paying varying bonus levels to increase retention versus the cost of training and paying higher numbers of initial accessions. Their data showed that a \$50,000 bonus was the optimal amount to achieve the desired department head school throughput of 275 officers per year.

As expected, the implementation of SWOCP increased retention through the department head tours for Surface Warfare Officers (SWOs) (Mackin, Darling, Hasan, & Crayton, 2002; "SWO Community," 2005). Although retention has improved, the SWO community is still struggling to reach its goal of 275 department head school graduates per year ("SWO Community," 2005). In response, the SWO community recently announced that SWOs would receive an additional \$25,000 for committing to serve two department head tours (Harvey, 2006). The SWO community managers have clearly placed an emphasis on using monetary incentives to increase retention. A preliminary review of the extensive literature pertaining to employee turnover, however, yields two other broad categories of stay/leave determinants apart from human capital approaches: job satisfaction and personal characteristics (Applebaum, Wunderlich, Greenstone, Grenier, Shapiro, Leroux, & Troeger, 2003; Barak, Nissly, & Levin, 2001; Clifton, 2003; Duffy, 2000; Jackofsky, 1984; Lok & Crawford, 1999; Lucas, 1999; McEvoy & Cascio, 1987; Miller & Wheeler, 1992; Mitchell, Holtom, Lee, & Graske, 2001; Nolan, 1993; Ribelin, 2003; Sheridan, 1992; Wilcove, Schwerin, & Wolosin, 2003).

Previous research has yielded fairly consistent results with respect to the influence of personal (both demographic and background) characteristics on the retention decision. Accordingly, a solid understanding in the literature exists as to how an officer's race, gender, commissioning source, marital status, and other personal characteristics influence his or her stay/leave decision (Bernard, 2002; Duffy, 2000; Gjurich, 1999; Nolan, 1993). With the exception of marital and dependent status, the impact of these variables is approximately equal when seen in men and women. Female officers tend to place a great emphasis, however, on the family commitment variable (Clifton, 2003). In short, much is known about the influence personal characteristics and increased pay has on retention. The same knowledge does not exist, however, with regards to one of the most significant variables in the retention decision: job satisfaction.

Many factors influence the construct that is job satisfaction. Such factors include organizational culture, relationships with supervisors, working environment, and relationships with peers and/or subordinates. The literature suggests that these job-related aspects all work together to influence an employee's job satisfaction and, by extension, his or her organizational commitment (Applebaum et al., 2003; Barak et al., 2001; Jacofsky, 1984; Lok & Crawford, 1999; Lucas, 1999; Mitchel, 1981; Ribelin, 2003; Satava, 2003; Sheridan, 1992). During a SWO junior officer's division officer tours, he or she will likely serve in two different ships and hold several different billets onboard those ships. These ships may or may not be in the same homeport. To this point, researchers have not devoted a study to exclusively determining how these assignment policies influence the stay/leave decision. It is likely that different aspects of assignment policies exert varying levels of influence on junior officers. Furthermore, this is the only aspect of satisfaction that the Navy directly controls. This study will quantify any trends in differing officer retention levels amongst certain ship-types, homeports, and onboard billets. The results of the proposed study will then allow Navy policymakers to better understand how assignment policy influences the stay/leave decision for junior SWOs.

## **B. SCOPE OF THE THESIS**

This thesis will examine Year Groups (YG) 1993-1997 and the relationship between Fleet experiences and retention for these Surface Warfare Officers. These Year

Groups provide the most up-to-date data, which becomes significant since the composition of the Surface Fleet is always changing. For example, studying the effect of ship type twenty years ago is not as useful since the Fleet looked very different then than it does now. Additionally, YG 94 was the first group of officers to see SWOCP as an option prior to their retention decision point. YG 93 will be used as a control group that did not see SWOCP as an option prior to its retention decision.

The aforementioned data do, however, limit the effectiveness of the analysis. The study will assume that if an officer is still designated as a SWO at Years Commissioned Service (YCS) 8 then he or she has accepted SWOCP and has continued in the Surface Navy. The only certain way to ascertain continuation, however, is to follow the officer to the Lieutenant Commander selection board. Utilizing this method does not allow the most up-to-date data to be included in the study. Additionally, the exact nature of what makes certain ship-types, homeports and billets more likely to generate higher retention will remain unknown. Hopefully, however, the results of this study will present enough background to conduct qualitative research in a future study to more precisely pinpoint causal factors. Finally, the retention model in this study will purposely exclude many significant predictors to isolate the effects of ship type, homeport, and billet. The resulting model then will be incomplete and must be seen as predicting only one aspect of the retention decision.

### **C. METHODOLOGY**

This study will utilize BUPERS data to conduct multiple regression analysis to determine the impact of assignment policy variables (ship type, homeport, and billet) on the retention decision of SWO junior officers. In doing so, the analysis will control for personal (background and demographic) characteristics that the literature has found to significantly influence the retention decision. These control variables include gender, ethnicity, marital status, commissioning source, prior enlisted status, and undergraduate major. Since the dependent variable (stay/leave) is dichotomous, the study will use non-linear logistic regression modeling techniques.

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## **II. LITERATURE REVIEW**

The wide array of literature pertaining to employee turnover simultaneously assists and restricts any researcher on this important topic. The breadth of information provides many theoretical models to consider, but it also makes it difficult to establish consensus as to the direction, weight, and significance of independent variables in their causal relationships with turnover. Despite this dilemma, this literature review will attempt to establish a theoretical underpinning for the data analysis in the following chapters. The present review will discuss the “basics” of retention modeling and will then proceed to analyze relevant job satisfaction and human capital theory research. The review will conclude with an in-depth discussion of past SWO retention studies.

### **A. INTRODUCTION TO RETENTION MODELING**

To maximize the effectiveness of any retention analysis, the researcher must first determine which independent variables to include in the model as control variables. Inaccurate inclusion or exclusion of variables can either exaggerate or diminish the actual effects of the independent variables of interest. Mitchell, Holtom, Lee, and Graske (2001) found that even the most complex retention models failed to explain as much as 75 percent of the variance in the stay/leave decision. They proposed that a wide variety of “shocks” often initiate the turnover process. These shocks include, but are not limited to, mergers, unsolicited job offers, friends’ leaving, spouse relocations, and poor performance appraisal. Clearly, this theory complicates the establishment of any retention model in that there is no way to fully account for the seemingly infinite number of events that Mitchell et al. would define as “shocks.” They do, however, definitively conclude that “[r]etention cannot be accomplished purely through money. A host of on-the-job and off-the-job factors must be considered when developing a retention plan.” (Mitchell et al., p. 104) In other words, while retention modeling is complicated, the researcher must avoid any tendency to explain away retention and turnover solely in monetary terms.

While Mitchell et al. (2001) certainly emphasize the importance of “shocks” in the initiation of a turnover process, they also argue that job dissatisfaction is the most frequent cause of turnover. A singular event might cause such dissatisfaction, but

turnover can also result from a steady “build-up” of dissatisfying job conditions. Accordingly, some employees have the time to develop a follow-on plan while others do not. Mitchel et al. therefore offer four paths that individuals might take when they leave a job: following a plan, leaving without a plan, leaving for something better, and leaving an unsatisfying job. Conversely, job satisfaction, organizational commitment, few alternatives, and “job embeddedness” reduce job turnover. Mitchel et al. use the term “job embeddedness” to refer to the tendency of work-life effects to influence the retention decision. For example, an employee might be more likely to stay in an organization because he or she enjoys playing on the company softball team and is pleased with the local school system. Mitchel et al. (p. 103) also emphasize the importance of fit—“an employee’s perceived compatibility with job, organization, and community.” In other words an employee’s likelihood to remain at a certain job is not as simple as measuring one’s current salary against an expected future salary. Instead, the interaction between an employee’s personal priorities and goals and the organization’s priorities and goals exerts stronger influence on the retention decision than more measurable determinants.

While Mitchell et al. (2001) provide a warning worthy of consideration with respect to oversimplifying the model, the literature should provide enough guidance to help determine a baseline retention model. The literature groups stay/leave determinants into three broad categories: job satisfaction, human capital, and personal characteristics. This literature review will focus on research from the civilian sector to explore the effects of job satisfaction. Discussion of human capital and personal characteristics effects will largely rely on previous SWO retention studies. Upon completion of the literature review, this analysis will present a hypothesized retention model that will include both background variables and variables that capture elements of the aforementioned fit construct and job satisfaction. Since job satisfaction is by no means a dichotomous variable, a thorough discussion of its many elements follows.

## **B. JOB SATISFACTION**

Having established in the previous section that non-monetary factors do play a significant role in the stay/leave decision, this review will now examine several elements within the “job satisfaction” construct. To begin, it will define job satisfaction and

present several studies that show the strong correlation between high job satisfaction and retention. One study will also draw important distinctions between the influence of job satisfaction in the civilian sector and in the military. This section will then explicitly highlight the importance of two “sub-elements” of job satisfaction: job performance and leadership. While these constructs certainly influence an employee’s job satisfaction, they possess unique characteristics that make them worthy of consideration in their own right. As the literature will demonstrate, job satisfaction, job performance, and leadership strongly relate to retention and therefore must not be ignored in any analysis of SWO retention. These determinants, however, are difficult to measure. The present study hopes to approximate differences in job satisfaction levels among junior SWOs by analyzing potential retention differences that correlate to initial homeports, ship types, and billets.

Applebaum et al. (2003, p. 273) define job satisfaction as “a general attitude toward one’s job; the difference between the amount of rewards workers actually receive and the amount they believe they should receive.” On the surface such a definition may seem to imply that financial compensation is the only barometer of an employee’s likelihood to experience high levels of job satisfaction. It is important to remember, however, that employers also use non-monetary rewards to motivate their employees. Since the literature has consistently pointed to job satisfaction as a critical factor in the stay/leave decision, it would be negligent to brush past the many lessons to be learned from the examination of job satisfaction studies (Applebaum et al.; Barak, Nissly, & Levin, 2001; Hay, 2002; Jackofsky, 1984; Lok & Crawford, 1999; Lucas, 1999; Mitchel, 1981; Ribelin, 2003; Satava, 2003; Sheridan, 1992). In their meta-analysis of articles pertaining to turnover in social service fields between 1980 and 2000, Barak et al. found that “work-related” factors predict turnover better than individual factors. They conclude that the most important contributors to turnover in human services fields are stress, burnout, and lack of job satisfaction. Although imperfect, comparisons between human services employees and naval officers make sense since both professions involve long work hours and potentially stressful situations. Sanchez, Bray, Vincus, and Bann (2004) utilized job satisfaction data from both active duty and reserve military members and found that high job pressure and supervisor-induced stress were the biggest predictors of



lower levels of job satisfaction. These results complement Barak et al.'s findings as both emphasize the strong relationship between work factors and job satisfaction. Sanchez et al. did, however, acknowledge the presence of higher job satisfaction levels in more senior (and thus older) military members. This conclusion indicates that personal characteristics must not be completely ignored in the development of the present retention model.

Results from a 1999 Quality of Life (QOL) survey of Navy enlisted personnel also seem to indicate that personal factors must not be ignored (Wilcove, Schwerin, & Wolosin, 2003). In fact the study concludes that personal factors better predict reenlistment intent than do work factors. While this may seem to contradict previously cited studies, a subtle, but critical, argument explains how such results can co-exist with the aforementioned civilian sector research (Applebaum et al., 2003; Barak et al., 2001; Hay, 2002; Jackofsky, 1984; Lok & Crawford, 1999; Lucas, 1999; Mitchel, 1981; Ribelin, 2003; Satava, 2003; Sheridan, 1992). Wilcove et al. postulate that the relatively short length of tours in the Navy may allow Sailors to remain committed to a naval career in the face of dissatisfying jobs. This ability to separate one's current satisfaction from long-term commitment is a potentially unique aspect of military service. From a retention standpoint, satisfaction with the prospect of future service is the most important element of job satisfaction. The 1999 QOL survey, however, only explains the presence of satisfaction in the current work environment—not throughout a future career.

### **1. Job Performance**

Within the job satisfaction literature, job performance and quality of leadership stand as the two most significant contributors to an employee's job satisfaction. In 1987 McEvoy and Cascio conducted a meta-analysis of 24 studies that examined the relationship between job performance and employee turnover. Although much of the evidence was inconclusive, they found that the overall relationship was negative. In other words, higher performance often leads to higher satisfaction, which in turns helps to reduce turnover. They found that job performance generally predicts turnover at a level comparable to organizational commitment, job satisfaction, and behavioral intentions. McEvoy and Cascio therefore recommend that job performance should be kept as an independent variable in future turnover studies to improve the predictive power of the

modeling. Since SWO qualification is the only available performance-related variable, however, the limited amount of performance data will mitigate the effectiveness of the proposed retention model.

One element that broaches the overlap between job performance and leadership quality is the intangible notion of job fulfillment as it relates to performance, satisfaction, and turnover. Lucas (1999) conducted a controlled experiment with college students in an attempt to determine if higher-status titles influence performance and satisfaction. He found that being designated as a leader increases satisfaction, commitment, performance, and reduces turnover intention. Although Lucas purposely did not account for relationships between these dependent variables, his research remains both viable and valuable to this study as it considers the influence of billet on retention. He cautions though that higher status titles for one worker may reduce effectiveness of his or her co-workers and that “empty” titles could lead to cynicism and potentially eliminate any gains wrought from the initial status increase. Although retention data on recently-commissioned YGs is not yet available, this notion of shallow responsibility leading to dissatisfaction echoes the concerns of some within the SWO community who fear that recent manning surpluses have potentially harmed long-term retention behavior. As such, future researchers would be wise to revisit this discussion in the coming years as the overmanned cohorts move past their MSRs.

Miller and Wheeler (1992) found that the aforementioned importance of job fulfillment shows stronger effects in women than in men. In 956 questionnaires they asked executives, managers, and professionals in a large city government, a university, and a large publicly held corporation to evaluate the level of different aspects of job satisfaction. Women were twice as likely to report they intended to leave the organization within two years. Gender alone, however, only accounted for two percent of the variance. When Miller and Wheeler altered their analysis to control for job satisfaction, these gender differences disappeared. In particular, the “meaningful work” component of job satisfaction was considerably more influential on women than on men. The literature, then, points to the importance of fulfillment to performance and satisfaction. Accordingly, the proposed retention model will include fleet experience variables (initial homeport, initial ship type, initial shipboard department) that should

partially account for differing degrees of fulfillment as displayed by differences in retention behavior. An absolutely critical influencer of all of these elements is the most important individual in the battle for corporate talent: the frontline supervisor.

## **2. Quality of Leadership**

Perhaps the single most consistent strand of argument within the job satisfaction and retention literature is that leadership matters. In her article discussing nurse management and retention at hospitals, Ribelin (2003, p. 18) comments that “[n]urses don’t leave hospitals, they leave managers.” Those nurses who maintain positive relationships with their immediate managers are more likely to demonstrate higher levels of organizational commitment. Managers who think and talk positively about the organization frequently are influential in their subordinates’ decision to remain at the hospital. Even more importantly, Ribelin emphasizes that the immediate supervisor’s opinion about a subordinate is more important than overall company policies.

In their 1999 study of nurses at seven large Sydney, Australia hospitals, Lok and Crawford examined the relationship between culture, commitment, leadership style, and job satisfaction. They utilized several different elements of job satisfaction to determine which needs influenced nurses more strongly in their opinions of their supervisors. They found that higher-order needs (level of control, amount of interaction, level of professionalism) exerted the greatest influence on commitment and job satisfaction. In other words, nurses whose supervisors remained attentive to these higher-order needs were more likely to exhibit higher degrees of organizational commitment and job satisfaction. Additionally, the nurses’ responses indicated that subcultures within their wards were more influential on their organizational commitment than an overall notion of hospital culture. Innovative and supportive subcultures had the most significant and positive impact on these feelings of commitment.

Lok and Crawford (1999) also studied the effects of different leadership styles on organizational commitment and job satisfaction. They utilized two broad categories of leadership styles: consideration and initiating structure. The consideration style emphasizes interpersonal relationships while the structure style emphasizes procedure and exactness in following protocols. Not surprisingly, the consideration leadership style more strongly influenced organizational commitment than did the structure leadership

style. One prerequisite of Lok and Crawford's study was that only those nurses whose manager had been on the job for over a year were included in the study. The researchers imposed this limitation in an attempt to ensure that the leadership styles and cultures being examined were somewhat stable and well-understood by the survey's respondents. Although this limitation influences the degree to which Lok and Crawford's findings may be translated to discussions about supervisor influence within the Surface Navy, their study is not the only one to determine that "people-first" managers increase organizational commitment and job satisfaction. Sheridan (1992) studied six international accounting firms and concluded that young professionals hired by firms emphasizing interpersonal relationships (team orientation and respect for people) stayed 14 months longer than those young professionals hired by firms emphasizing work task values. Additionally, Satava (2003, p. 68), who also studied accounting firms, found that "[a] corporate culture that emphasizes teamwork and civility over rigid quotas and systems will hang on to its employees (and its training investment) longer . . ." Clearly, leadership—and its strong influence on job satisfaction, commitment, and culture—matters.

Hay (2002) argues that pay is not the major factor that leads to dissatisfaction amongst employees. Instead, his survey of employees working for 330 companies in 50 countries in six different fields (information technology, sales, hourly, clerical, professionals, and managements) indicates that employees who leave their jobs are typically more dissatisfied with how their talents are being used and the lack of attention managers give to career development. With few exceptions, the reviewed literature concurs with the importance of non-monetary factors in the retention decision (Applebaum et al., 2003; Barak et al., 2001; Jackofsky, 1984; Lok & Crawford, 1999; Lucas, 1999; Mitchel, 1981; Ribelin, 2003; Satava, 2003; Sheridan, 1992). Ignoring the influence of job satisfaction and particularly the importance of job performance and leadership, on the stay/leave decision can quickly lead an organization into dangerous waters.

While this point may seem rather elementary, it cannot be overstated. In the context of the present study, a difference in retention associated with fleet experience variables might indicate that leadership differs between ship types, departments, or

perhaps even homeports. In other words, differing retention patterns between the fleet experience variables could indicate that certain types of leaders (more positive or more negatives ones depending on the direction of influence) might gravitate towards certain jobs on certain ships in certain homeports. Differences in retention between officers who have served in certain departments onboard ship might indicate that the associated department heads are more likely to express positive (or negative) views about remaining in the Surface Navy. By way of example, many SWOs might argue that serving in the engineering department is the most difficult assignment onboard ship. The constant attention required to successfully maintain any ship's engineering plant can often lead to a stressful work life for those charged with its care. Therefore the ship's engineer might be more likely to exhibit behaviors that would dissuade his or her division officers from following in his or her footsteps as a department head.

The inclusion of ship type, homeport, and billet is intended to partially capture the retention effect of higher (or lower) job satisfaction levels. In other words, are leadership styles conducive to retention more likely present in certain types of ships or does the quality of life in certain homeports lead to increased job satisfaction and therefore improved retention levels? These are just a few of the questions that the present study hopes to explore by analyzing the effects of fleet experience variables on retention. While this study will not be able to precisely pinpoint satisfaction levels or leadership effects, it does have the potential to provide background for further qualitative research into often overlooked SWO retention determinants.

### **C. HUMAN CAPITAL FACTORS**

The majority of retention initiatives undertaken by the SWO community managers have centered on economic incentives. The most significant of these is clearly Surface Warfare Officer Continuation Pay (SWOCP)—a \$50,000 bonus given to SWO junior officers who commit to completing two 18-month afloat department head tours. Recently, this figure increased to \$75,000 with the creation of a Junior SWO Critical Skills Retention Bonus (CSRB). Officers are eligible to receive a percentage of the Junior CSRB at YCS 6 and YCS 7. In light of increasing bonus figures, any SWO retention study would be incomplete without a discussion of the human capital theory

that is the impetus behind retention incentive pay. Since the present study will examine data from YGs 93-97, the creation of SWOCP in FY 2000 might partially explain any increases in retention rates between YGs.

Barak et al. (2001, p. 627) explain that “[h]uman capital lies within a person. Hence, it is not easily transferable; it can be gained only by investing in a person over a long period of time.” Such a notion is especially true in the Surface Navy’s “close-ended” personnel system since all personnel within it must be “grown” (Mackin & Darling, 1996). Unlike many other organizations the SWO community managers cannot deploy officers to a job fair and hire a crop of new department heads. Instead, the personnel system must have enough flexibility to respond to varying turnover rates so that the community consistently meets its required manning objectives. In determining expected retention rates, analysts utilize the Annualized Cost of Leaving (ACOL) method that compares expected military compensation over a given time period with expected civilian sector compensation over the same period. Once factors that account for “taste” are included, the analyst will predict that an officer will remain in the Navy if his or her military figure exceeds his or her civilian figure. In 1996 Mackin and Darling conducted a study using this methodology to determine projected retention rates for the proposed SWOCP that was then in development.

### **1. SWOCP Study (1996)**

Initial justification for SWOCP was threefold: to increase retention and therefore reduce overall cost by eliminating unnecessary accessions and associated training costs, to alleviate current shortfalls within certain SWO year groups, and to improve the community’s ability to attract quality new accessions (Mackin & Darling, 1996). Mackin & Darling analyzed the projected viability of SWOCP by calculating whether cost savings from reduced accessions would offset the costs of the bonuses themselves. They modeled projected retention behavior using pay elasticities from the Naval Aviation and Nuclear Power communities. They estimated projected savings using the Navy’s Billet Cost Factor analysis that stipulate the taxpayer cost per accession. To ensure conservative estimation, they assumed that USNA accessions would remain constant and that reductions would come from the ROTC and OCS programs. Additionally, they assumed that post-commissioning training costs would remain fixed. Based on the above

assumptions and a cohort that included only conventional SWOs (since Mackin and Darling assumed that nuclear option SWOs would opt for the higher nuclear power bonuses), the ACOL modeling suggested that the Navy should pay SWOs between YCS 5 and YCS 8 an additional \$10,000 per year for service beyond Minimum Service Requirement (MSR). The suggested payments would cease at YCS 10. As previously mentioned, the Navy instituted a \$50,000 SWOCP in FY 2000 that looked very much like Mackin and Darling's suggested form.

## **2. SWOCP Study (2002)**

Six years after the initial study, Mackin, Darling, Hasan, and Crayton (2002) designed a basic econometric model of SWO retention behavior. As in the earlier study, they utilized ACOL modeling but readily admitted that no analysis could ever pinpoint all factors involved in the stay/leave decision. They also acknowledged that an unusually strong labor market and a relatively higher demand for more senior SWOs than junior SWOs exacerbated their analysis. In an improvement over the 1996 analysis they included many variables in addition to the ACOL variable: unemployment rate, commissioning source, prior enlisted status, gender, race (white/non-white), dependents (yes/no), initial ship type assignment, and department head tour length. They analyzed 1979-2000 data pertaining to conventional SWOs, conducting the ACOL analysis at seven career decisions points—the first being at YCS 5.

As expected, increased pay positively correlated with retention at each decision point. Higher unemployment rates also improved retention statistics. At the first decision point, the data indicated that the following variables demonstrated a strong, positive correlation with retention: female, OCS, and prior enlisted status. USNA graduates were more likely to retain than ROTC graduates but were less likely to retain than OCS graduates. Having dependents showed a weak, but positive, correlation with retention. Additionally, non-white officers were less likely to remain in the Surface Navy than white officers. Initial ship assignment did not relate significantly to retention, while longer department head tours reduced an officer's likelihood of retaining.

Although Mackin et al. do not directly address the issue, the result that female officers are nearly 10% more likely to retain than male officers is indeed surprising since such a finding is inconsistent with the SWO retention studies cited in the forthcoming

section. It should be noted, however, that their officer cohort was slightly less than 3% female. Additionally, only the last few year groups in the study served the majority of their careers after the repeal of the combat exclusion law in 1993. Combining this factor with the already-low percentage of women in the study, the cause of higher retention in females is likely a case of self-selection. In other words, a woman's career path greatly differed from a male's career path prior to 1993. Until the repeal of the combat exclusion law, women could only serve in support (non-combatant) ships such as fleet oilers or supply ships. While URL commissioning requirements compelled many men to serve in surface combatants, women served onboard ship by their own volition. Since policy did not "force" them into an afloat community, those who volunteered self-selected the more rigorous lifestyle associated with a career laden with extensive sea duty.

Mackin et al. (2002) do, however, address the insignificant impact of initial ship assignment on retention. They postulate that the inconclusive findings might be the partial result of inappropriate ship-type groupings or errors in Unit Identification Code errors. They group the ship classes as follows: auxiliary, big amphibious ships, small amphibious ships, guided-missile destroyers/cruisers, destroyers/frigates, carriers, minesweepers, afloat staff, and other assignments. Furthermore, they did not include USNA and ROTC officers in this part of the study since ship assignments are not random for these officers. After examining both the monetary and non-monetary factors included in their model, Mackin et al. concluded that SWOCP had increased retention at MSR by over 15%. They are quick to admit, however, that since the Navy instituted SWOCP in the last year of their data set further research is required to understand the long-term effect of the bonuses. Amongst other factors, they also recommend that further research should include geographic location in SWO retention studies. Accordingly, the present study will include an independent variable that accounts for any influence geographic location might have on retention.

#### **D. PREVIOUS SWO RETENTION STUDIES**

Before concluding this literature review and proceeding with the present analysis, it is instructive to examine several other statistical studies that explored SWO retention determinants. As mentioned in the previous section, Mackin et al. (2002) concluded that the following characteristics have a significant and positive impact on



retention: white, female, OCS graduate, prior enlisted, and dependents. Of these findings, it should be noted that the direction of gender influence is erroneous. Women only retain in the Surface Navy at approximately half the rate men do. (“SWO Community” brief, 2006). The other findings, however, are consistent with similar studies although overall trends are somewhat inconclusive. This section will examine several previous studies to help establish SWO retention trends. Once the review identifies significant determinants, the analysis will continue with a hypothesized SWO retention model.

### **1. Bautista (1996)**

Bautista utilized longitudinal data from YGs 1976-1990 to examine retention trends in three different career phases: termers, doubter, and career. “Termers” are those officers who have not yet reached their MSR. “Doubters” are those who have reached MSR but have yet to “appear” before the LCDR Promotion Board. “Careerists” are those officers who have passed the LCDR Board milestone. Bautista defined separators as those officers who left the Navy prior to the LCDR Board (YCS 9). While the influence of ship type on retention was the focus of his study, Bautista did examine the influence of personal background characteristics. For termers the following characteristics positively related with retention: age, black, graduate education, low college GPA, and OCS graduate. Most relationships remained constant into the doubter phase, but USNA and NROTC graduates became less likely to separate than OCS graduates. With respect to accession source, Bautista concluded that while USNA and NROTC graduates are more likely to separate at MSR, they have a higher chance of continuing for a career if they do decide to stay in the Navy at their first decision point. Bautista also found that junior officers who received RAPs (Recommendation for Accelerated Promotion) were more likely to remain in the Navy past MSR. In other words, job performance positively correlates with retention.

Bautista’s logit analysis did not reveal any significant relationships between ship type and retention during any of the three career phases. He does, however, argue that since CRUDES assignment is conducive to timely SWO qualification those officers who have served in CRUDES ships may be more likely to remain in the Navy by virtue of higher performance appraisals spurred by timely qualification. Both black and white

officers initially assigned to aircraft carriers exhibit lower retention rates than officers initially assigned to other types of ships. As mentioned above, though, this trend does not remain evident when the logit analysis includes other variables. Bautista concludes his analysis by remarking that while certain trends do seem to be important, the interrelationships among all of the variables exert stronger forces than does any single factor.

## **2. Johnson (1998)**

Johnson analyzed the effect of both pre-commissioning and post-commissioning variables on the retention decision using Officer Promotion History Files data on YGs 1976-1986. He included demographics, education background (major and GPA), and commissioning source in his pre-commissioning grouping. His post-commissioning variables included performance, ship assignment, retention, and promotion. Johnson used timeliness of SWO qualification and fitness report scores as performance proxies. The SWO qualification variables captured years to qualification and whether or not an officer attained qualification within two years of commissioning. He defined ship assignment as a binomial variable that identified those who had CRUDES experience (CG/DD/DDG/FFG) in their division officer tours. Of note, 75% of officers in the data files had CRUDES experience. Service through the LCDR board determined retention, and selection to LCDR at the board determined promotion. During his analysis, Johnson used the post-commissioning variables as both independent and dependent variables.

Johnson's study provides several observations to guide the present analysis. Most significantly, he found that post-commissioning variables have the strongest influence on promotion to LCDR. Specifically, CRUDES experience was a strong predictor of both retention and promotion. The data also showed a positive correlation between GPA and CRUDES assignment—a conclusion that supports anecdotal evidence from this author who has observed that cruisers and destroyers are generally more “popular” with midshipmen who have the opportunity to pick their initial ship assignments. Johnson also concluded that being a USNA graduate and an undergraduate non-engineering major improved one's chances of early SWO qualification. He completes his analysis by

observing that the first step towards a successful SWO career is CRUDES assignment during the division officer tours since such assignment predicts early qualification, retention, and promotion.

### **3. Duffy (2000)**

Like Bautista and Johnson, Duffy studied the impact of both pre-commissioning and post-commissioning variables on the retention decision within the Surface Warfare community. He used data from the Navy Officer Master File and the Navy Officer Loss File to study the behavior of YGs 1977-1985. Amongst these year groups, Duffy excluded Surface Nuclear officers because of differing retention patterns. He also excluded women since they were restricted to the Combat Logistics Force (CLF) branch of the SWO community during the relevant time period. Duffy grouped his cohort into three groups: STAYSWO (SWOs promoted to LCDR), STAYNAV (officers promoted to LCDR but no longer designated as a SWO), and LEAVERS (officers who began as a SWO but no longer remain in the Navy). He defined the following variables as baseline retention factors: undergraduate major, age at commissioning, number of dependents at LT board, undergraduate GPA, commissioning source, and ethnic background. Fleet experience variables include initial ship type assignment, initial department assignment, percent of O-1 and O-2 fitness reports with a RAP, number of billets held as a junior officer, whether or not an officer served in more than one ship as a division officer, and whether or not the officer began his career in the SWO community. Unlike Johnson, Duffy included multiple categories in this ship type variable: carrier, cruiser, destroyer, frigate, battleship, big amphibious ships, CLF ships, minesweepers, and small amphibious ships.

Duffy excluded the STAYNAV grouping when he conducted a logistic regression to determine factors that predict inclusion in the STAYSWO grouping. He found that adding the fleet experience factors improved the predictive power of the baseline model. These variables positively related to retention: age, married with children, divorced with children, service in a cruiser or destroyer (relative to service in a frigate), RAPs, number of junior officer billets, and service in multiple ships. Negatively related variables include engineering and business majors (relative to pure science majors), undergraduate GPA, and OCS graduates (relative to USNA graduates). Duffy hypothesized that the

lower retention rates of those with engineering and business majors and those with higher GPAs might be the result of higher civilian earnings potential. With respect to commissioning source, Duffy reasoned that USNA and ROTC graduates might have a better initial understanding of the SWO lifestyle and therefore were less likely to suffer negative shock effects than were OCS graduates.

#### **E. CHAPTER SUMMARY**

This literature review attempted to determine the influence of work factors, non-work factors, monetary factors, and non-monetary factors on the retention decision. Based on research from the civilian sector, non-monetary work factors most strongly influence an employee's likelihood to remain at his or her current job. Most significant amongst these determinants are job satisfaction, job performance, and leadership quality. Higher job performance and effective, positive leadership usually increase an employee's job satisfaction and therefore his or her intention to remain at an organization. Previous SWO retention studies demonstrate the significant influence of several demographic and background characteristics: gender, ethnic background, commissioning source, undergraduate major, age, dependent status, and prior-enlisted status. Because of their consistent significance in retention analysis, these variables will comprise the present study's baseline retention model. To address the problem of multicollinearity in the analysis, care will be taken to specify uncorrelated independent variables in all regression model specifications.

Previous studies also indicate a general trend that CRUDES experience increases the chances that an officer will remain in the Surface Navy. To ensure that the present study does not omit potentially significant effects of CRUDES experience, the analysis will lend special consideration to CRUDES experience in an officer's background. Given the importance placed on non-monetary factors in the civilian research this study will now proceed by examining the effects of Navy experience variables—ship-type, homeport, and billet—on the retention decision. Although precise measurement is impossible, each of these variables can potentially influence a junior officer's job satisfaction. In the case of ship-type and billet, different classes and departments might attract varying leadership styles that could influence division officers' retention decisions. Ships also operate in different environments and under a myriad of

circumstances based on the type of ship and its homeport. If retention levels then vary between these classes and ports, one can reasonably conclude that there is something about service in said platforms and locations that is more (or less) satisfying. These scenarios are just a few that indicate the potential importance of fleet experience variables in the retention decision. The next chapter will more thoroughly discuss these variables and their expected impact on the stay/leave decision.

### III. DATA AND METHODOLOGY

The previous chapter established a theoretical foundation to guide the present analysis by exploring the civilian literature pertaining to employee turnover. Job satisfaction, job performance, and leadership effectiveness clearly play an important role in an employee's stay/leave decision. Previous SWO retention research, however, cautions the analyst to not ignore critical background and demographic characteristics. This chapter will present a retention model that accounts for both job satisfaction and background influences.

#### A. DATA

This study utilized Bureau of Naval Personnel (BUPERS) data from the Officer History Promotion Files and the Navy Master Loss File. Additionally, the study merged the BUPERS data with demographic and background information from the Center for Naval Analysis (CNA) to ultimately yield 3,206 cases for Surface Warfare Officers in YGs 93-97. The merged, final data set included 461 variables—some of which resulted from the recoding of variables in the initial data set.

#### B. METHODOLOGY

The dichotomous nature of the dependent variables necessitated the use of non-linear logistic regression analysis to ascertain the influence of the control and independent variables. Once the literature review established which control variables should be included in the retention model, the author conducted multiple regressions to determine which independent variables to include in the final retention model. The following sections will describe the characteristics and expected influence of both the control and independent variables in the retention model. After conducting the final regression analysis, the author calculated the marginal effects ( $Fx$ ) of each variable using the following equation:

$$Fx = \beta \times p(1 - p), \text{ where:}$$

$$\beta = \text{logit coefficient and } p = \frac{1}{1 + e^{-\sum(\bar{x}\beta)}}$$

The next chapter will utilize the marginal effects information to describe the extent of the influence of the significant variables in the final regressions.

### **C. VARIABLES IN THE RETENTION MODEL**

The literature review proposed that any SWO retention analysis should include the following demographic and background variables: gender, ethnic background, commissioning source, undergraduate major, age, dependent status, and prior-enlisted status. Since the age at commissioning variable and the prior enlisted variable are highly correlated, the model will only include the prior enlisted variable. The model will also include a Year Group variable to control for expected SWOCP effects, varying economic conditions, and the surge in retention generally associated with the 9/11 attacks. In order to explore the potential effects of differing job satisfaction levels on retention and to examine the Navy's assignment policies, the retention model includes these independent variables: initial homeport, CRUDES experience, and initial department. Table 1 outlines the variables in the proposed retention model:

Table 1. Categorical Percentages of Variables in the Retention Model

| <b><u>Control Variables</u></b> |      | <b><u>Independent Variables</u></b> |      |
|---------------------------------|------|-------------------------------------|------|
| <b>Gender</b>                   |      | <b>Initial Homeport</b>             |      |
| Male                            | 89.5 | MIDLANT                             | 33.3 |
| Female                          | 10.5 | PACNW                               | 7.9  |
| <b>Ethnicity</b>                |      | SOCAL                               | 26.4 |
| White                           | 76.3 | SOUTH                               | 17.3 |
| AfrAmer                         | 9.3  | HAWAII                              | 6.5  |
| Hispanic                        | 7.8  | OVERSEAS                            | 8.6  |
| Other                           | 6.7  | <b>Crudes Experience</b>            |      |
| <b>Dependent Status</b>         |      | Only                                | 49.9 |
| SingleNoKids                    | 50.0 | MoveOut                             | 14.8 |
| MarNoKids                       | 29.1 | MoveIn                              | 9.0  |
| MarDivKids                      | 21.0 | Never                               | 26.3 |
| <b>Prior Enlisted</b>           |      | <b>Initial Department</b>           |      |
| Non-Prior                       | 78.0 | Engineering                         | 39.8 |
| Prior Enlisted                  | 22.0 | Weapons                             | 24.0 |
| <b>Comm. Program</b>            |      | Operations                          | 36.2 |
| USNA                            | 40.1 |                                     |      |
| ROTC                            | 40.1 |                                     |      |
| OCS-Other                       | 19.7 |                                     |      |
| <b>Undergrad Major</b>          |      |                                     |      |
| Engineering                     | 28.4 |                                     |      |
| PhySci&Math                     | 15.8 |                                     |      |
| BioSci                          | 4.6  |                                     |      |
| SocSci                          | 20.4 |                                     |      |
| Bus-Econ                        | 9.3  |                                     |      |
| Humanities                      | 6.6  |                                     |      |
| Unknown                         | 14.9 |                                     |      |
| <b>Year Group</b>               |      |                                     |      |
| YG93                            | 20.1 |                                     |      |
| YG94                            | 20.1 |                                     |      |
| YG95                            | 22.2 |                                     |      |
| YG96                            | 20.1 |                                     |      |
| YG97                            | 17.4 |                                     |      |

Each paragraph that follows will describe the frequencies, characteristics, and expected influence of each of the above variables. This chapter will conclude with a figure that summarizes the expected influence of each variable in the proposed model in the retention decision.

### 1. Gender

The gender variable in the data set is dichotomous, where male=0 and female=1. Of the 3,206 officers in the data set, 337 (10.5%) are female. Historical BUPERS data show that women retain at a significantly lower rate than men (“SWO Community” brief, 2005). Many women view the SWO lifestyle as mutually exclusive with starting a family



and therefore leave the community at a higher rate (Clifton, 2003). Accordingly, the predicted influence of the gender variable is significant and negative.

## **2. Ethnic Background**

The ethnic background variable is categorical. Of the 3,206 officers in the data set, 2445 (76.3%) are white, 297 (9.3%) are African-American, 249 (7.8%) are Hispanic, and 215 (6.7%) are members of “other” ethnic groups. These groups include, but are not limited to, Asian, Pacific Islander, and Native American. Throughout this analysis, “white” is the reference ethnicity. Previous SWO retention studies utilized YGs that are more senior than YGs 93-97 (Bautista, 1996; Duffy, 2000; Mackin et al., 2002). In these studies, whites comprised a greater percentage of the total population than they do in the current study. Bautista found that non-whites were more likely to remain in the Surface Navy while Mackin et al. found that whites were more likely to remain. Duffy did not find a statistically significant relationship in his ethnicity variable. Unlike previous studies cited, this analysis differentiates Hispanics from other minority populations. Since minority officers might perceive greater advancement opportunities in the Navy than in the civilian sector, the predicted influence of being an ethnic minority is positive. This relationship may, however, be weak if it is significant.

## **3. Commissioning Source**

The commissioning source variable is categorical. Of the 3,206 officers in the data set, 1286 (40.1%) are USNA graduates, 1287 (40.1%) are ROTC graduates, and 633 (19.7%) received their commissions via OCS or other officer accession programs. Throughout this analysis, USNA is the reference commissioning source. As with the ethnicity variable, previous SWO retention studies are not consistent with respect to the effect of commissioning source on retention. Bautista (1996) and Mackin et al. (2002) found that OCS graduates were more likely to remain in the Surface Navy than USNA and ROTC graduates, while Johnson (1998) and Duffy (2000) found that being a USNA graduate was conducive to retention in the Surface Navy.

A significant difference between the officer cohorts examined in the present analysis and those examined in previous studies is that OCS graduates comprise a much smaller percentage of the total population in this study’s cohort. The downsizing of the military in the 1990s accounts for this difference since the OCS program is the first one

to see reductions in its throughput when the Navy decides to reduce officer accessions. The differences in commissioning source proportions from previous studies make predicting the effect of commissioning source in the current analysis difficult. One can argue that USNA graduates are more likely to remain in the Navy because they have a higher “taste” for the military lifestyle. Otherwise, they would not have matriculated at the Naval Academy. Since USNA graduates (with the exception of those disqualified medically) must enter the Unrestricted Line, they also, however, are probably more likely to laterally transfer to the Restricted Line and Staff Corps communities since those careers are not initially viable options. On the other hand, OCS graduates might be more inclined to stay in the Surface Navy since they had the option to enter a Restricted Line or Staff Corps pipeline as ensigns. Reductions in the number of OCS accessions also could have made the program more competitive. Accordingly, those who successfully competed might have possessed a high “taste” factor for the military lifestyle. Because of these factors, being an OCS graduate will most likely make an officer more likely to remain in the Surface Navy in the present analysis. Naval Academy graduates also should be more likely to laterally transfer from the Surface Navy since the Restricted Line and Staff Corps communities are generally not options at commissioning. Those officers who are ROTC graduates will likely fall somewhere between OCS and USNA graduates with respect to their behavior patterns. While certainly an imperfect generalization, this prediction rests on the notion that the nature of the ROTC experience lies somewhere in between the OCS and USNA experience—thus making ROTC graduates likely to behave moderately when compared to peers from the other two commissioning sources.

#### **4. Undergraduate Major**

The undergraduate major variable is categorical. Of the 3,206 officers in the present analysis, 909 (28.4%) majored in engineering, 506 (15.8%) majored in the physical sciences or mathematics, 149 (4.6%) majored in the biological sciences, 653 (20.4%) majored in the social sciences, 299 (9.3%) majored in business or economics, 212 (6.6%) majored in the humanities, and 478 (14.9%) do not have undergraduate major information in their pre-commissioning records. Throughout the analysis, engineering is the reference category. Since this analysis includes pre-commissioning variables only as

control variables, all data analysis will include those records with unknown undergraduate majors. Preliminary data analysis of those records exclusively indicated that they do not differ from the population at large.

Johnson (1998) found that humanities and business majors were more likely to leave the Navy prior to the O-4 board than were engineering majors. Science and mathematics majors, however, were more likely to remain in the Navy. Duffy (2000) found that engineering majors (when compared to pure science majors) were less likely to remain in the Surface Navy but more likely to laterally transfer into another community. Accordingly, the current analysis should find that engineering majors are more likely to leave the Surface Navy than other undergraduate majors. As Duffy hypothesized, the potential earning power of those with engineering degrees makes them more likely to leave.

#### **5. Dependent Status**

The dependent status variable is categorical. Of the 3,206 officers in the data set, 1602 (50.0%) are single, 932 (29.1%) are married with no children, and 672 (21.0%) are either married or divorced with one or more children. Throughout this study, single officers are the reference group. Previous SWO retention studies differentiated between divorced and married officers who had children. This analysis combines the two situations in order to measure the effect of children, rather than marriage, on retention. Duffy (2000) and Mackin et al. (2002) both found that having dependents positively relates to retention in both the Navy and the Surface Navy specifically. The present study should also find that officers who have children are more likely to remain in the Navy since this group has stronger ties to both the financial and medical/dental benefits of service in the military.

#### **6. Prior-Enlisted Status**

The prior-enlisted status variable is dichotomous, where non-prior=0 and prior=1. Of the 3,206 officers in the data set, 704 (22.0%) served as enlisted Sailors, Marines, Airmen, or Soldiers. Throughout this analysis, officers without prior-enlisted service comprise the reference group. Mackin et al. (2002) found a strong, positive relationship between prior-enlisted service and retention. Since officers with prior service are both older and closer to retirement, they should always be much more likely to remain in the

Navy. Accordingly, the current analysis predicts a strong, positive correlation between prior-enlisted service and retention in the Navy.

### 7. Year Group

The year group variable is categorical. Of the 3,206 officers in the present study, 645 (20.1%) are in YG93, 646 (20.1%) are in YG94, 712 (22.2%) are in YG95, 646 (20.1%) are in YG96, and 557 (17.4%) are in YG97. Generally, YG93 was the last YG to make its stay/leave decision prior to the SWOCP initiative. Therefore, if the modeling conducted in Mackin & Darling (1996) and Mackin et al. (2002) is correct, retention should increase as SWOCP becomes a more permanent reality to SWOs. Accordingly, YG93 is the reference group for the present analysis, and all other YGs are expected to positively relate to retention. Additionally, many officers in YGs 96 and 97 reached their decision points after the 9/11 attacks that sparked an increase in patriotism and commitment to service throughout much of the country. Any increases in retention must therefore be seen not only as being related to the institution of SWOCP but also within the context of 9/11 and changing economic conditions.

### 8. Initial Homeport

The initial homeport variable is categorical. Table 2 summarizes the initial homeport distribution of the 3,206 officers in the present analysis:

Table 2. Initial Homeport Descriptive Statistics

| Homeport                               | Frequency | Percent |
|--|-----------|---------|
| MIDLANT (Norfolk)                      | 1066      | 33.3    |
| PACNW (Everett, Bremerton)             | 254       | 7.9     |
| SOCAL (San Diego)                      | 846       | 26.4    |
| SOUTH (Mayport, Pascagoula, Ingleside) | 554       | 17.3    |
| HAWAII (Pearl Harbor)                  | 209       | 6.5     |
| OVERSEAS (Yokosuka, Sasebo)            | 277       | 8.6     |

While Table 2 denotes the significant homeports associated with each geographic category, Appendix A contains a complete listing of all homeports in the data set and their corresponding geographic category. Since MIDLANT is the largest category, it will be the reference category for this study.

No previous SWO retention study has statistically analyzed the effect of a junior officer's initial homeport on his or her retention decision. As established in the literature review of the present study, job satisfaction is clearly a significant determinant of one's likelihood of remaining within an organization. While job satisfaction most clearly relates to the impact the actual job has on one's happiness, the work-life balance is also crucial. One's quality of life "on the beach" cannot be ignored when considering that officer's satisfaction level with his or her current circumstances. For instance, if an officer loves living in San Diego and realizes that service in the Navy is the enabler of said living arrangement, then it is reasonable to conclude that this same officer might see the Navy as a more attractive downstream career option. If, on the other hand, the officer perceives that the Navy is the reason he or she is "stuck" in an undesirable location, then that officer is probably more likely to seek employment elsewhere. Although higher retention levels in certain homeports do not precisely equate to higher job satisfaction in those ports, it could point to something that makes life generally more satisfying for those living in certain areas.

A myriad of factors could contribute to an officer garnering satisfaction from where he or she lives—cost of living, quality of schools, recreational opportunities, proximity to friends and family, housing market, and population density are just a few of many factors that make certain places more attractive for certain people. Additionally, the author has observed anecdotal evidence that a perception exists in the Surface Navy that commands on the West Coast are more "laid back" than those on the East Coast. Whether or not this perception is fact is certainly open to interpretation. If retention levels differ greatly between certain homeports, then one can again reasonably conclude that there might be something about the commands in that geographic area that make them more likely to produce career-minded junior officers. Since West Coast homeports are generally more popular with midshipmen (as observed anecdotally by the author), those junior officers who initially serve in West Coast homeports (Southern California, Hawaii, Pacific Northwest) should be more likely to remain in the Navy.

## **9. CRUDES Experience**

Unlike the initial homeport variable, previous SWO retention studies have examined the effect a junior officer's ship-type has on his or her retention behavior.

Figure 1 summarizes the findings of those studies discussed in this study’s literature review:

Figure 1. Initial Ship Assignment Analysis Summary from Literature Review

| <b>Study</b>         | <b>Finding</b>   |
|----------------------|--|
| Bautista (1996)      | No significant relationships in logit analysis; Officers initially assigned to aircraft carriers less likely to retain |
| Johnson (1998)       | CRUDES experience strong predictor of retention and promotion to LCDR  |
| Duffy (2000)         | Service in cruiser or destroyer positively relates to retention  |
| Mackin et al. (2002) | No significant relationships in analysis (Did not include USNA and ROTC graduates in ship assignment analysis)         |

In addition to the above findings, both Bautista (1996) and Johnson (1998) found that CRUDES experience is conducive to timely SWO qualification amongst junior officers. Johnson also found a positive correlation between college GPAs and initial assignment to a cruiser or destroyer. These findings likely indicate that potentially more capable and motivated junior officers choose to initially serve in CRUDES ships.

During preliminary analysis, this author utilized the following ship type groupings:

Table 3. Initial Ship Type Groupings, Frequencies, and Percent Within Sample

| <b>Grouping</b> | <b>Ship classes</b>                | <b>Frequency</b> | <b>Percent</b> |
|-----------------|------------------------------------|------------------|----------------|
| Carriers        | CV, CVN                            | 184              | 5.7            |
| Cruisers        | CG, CGN                            | 585              | 18.2           |
| Destroyers      | DD, DDG                            | 935              | 29.2           |
| Frigates        | FFG                                | 553              | 17.2           |
| Small Amphibs   | LPD, LSD, LST                      | 403              | 12.6           |
| Big Amphibs     | LCC, LHA, LHD, LPH, MCS            | 238              | 7.4            |
| PCMinesweep     | ACU, MCM, MHS, MSC, PC             | 101              | 3.2            |
| CLFleet         | AD, AE, AGF, AO, AOE, AOR, ARS, AS | 207              | 6.5            |

Since the destroyer grouping accounted for the largest percentage of initial assignments, the preliminary analysis used it as the reference group. After continued analysis, however, it became evident that the CRUDES experience variable improved the retention model's predictive power to a greater extent than did the initial ship type variable. The CRUDES variable in use is categorical and describes a junior officer's initial career progression with regards to service in a CG, CGN, DD, DDG, or FFG. Of the 3,206 officers in the study, 1599 (49.9%) served only in CRUDES platforms, 474 (14.8%) served in a CRUDES platform and then a non-CRUDES platform, 290 (9.0%) served in a non-CRUDES platform followed by a CRUDES platform, and 843 (26.3%) never served in a CRUDES platform. The "Only CRUDES" variable is the reference category throughout this analysis.

Similar to previous studies, cross-tabulation analysis illustrated a relationship between both commissioning source and CRUDES experience and timely SWO qualification and CRUDES experience. Naval Academy graduates were more likely to have served only in CRUDES platforms and were less likely to have never served in CRUDES platforms. This observation supports anecdotal evidence that CRUDES platforms are more "popular" with officer candidates since during the years in which this study's officers earned their commissions only USNA graduates selected their initial ships. All others received assignments from BUPERS based on the "needs of the Navy." Preliminary data analysis also illustrated the relationship found in Bautista (1996) and Johnson (1998) that CRUDES experience is conducive to a timely SWO qualification. In the current study, those officers who never served in a CRUDES platform were less likely to earn SWO qualification within 30 months of commissioning.<sup>1</sup> Clearly, CRUDES experience exerts a strong influence on a junior SWO's career progression. Therefore, those officers without any CRUDES experience should be significantly less likely to remain in the Navy.

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<sup>1</sup> Cross-tabulation analysis indicated that 61.0% of officers with only CRUDES experience earned SWO designation within 30 months of reporting to their first ship. Only 53.1% of those officers without any CRUDES experience met this qualification milestone. The MoveOut and MoveIn groups qualified within 30 months at respective rates of 69.0% and 69.1%. The significantly higher qualification rate in these groups could be slightly inflated, however, since all officers who moved between commands would have qualified during their first tour. The Only CRUDES and Never CRUDES groups likely include officers who failed to attain qualification since they would only have served in one ship (junior officers do not transfer to their second ship without SWO qualification).

## **10. Initial Department**

Of the SWO retention studies in the present study's literature review, only Duffy (2000) included an officer's initial department assignment as part of the analysis. His study, however, did not find any significant relationships between initial department assignment and retention. This study will still include initial department as a categorical variable in order to verify Duffy's results or, if appropriate, to attempt to explain why one department appears to be conducive to retention over another. BUPERS assigns officers to shipboard billets based on each ship's Officer Distribution and Control Report (ODCR). Ideally, each officer holds a distinct Navy Officer Billet Classification (NOBC) code. The Manual of Navy Officer Manpower and Personnel Classifications (NAVPERS 15839I, Volume I, Part C) catalogs the four-digit NOBC code and describes the duties associated with each officer billet—both ashore and afloat.

Since junior officers often hold multiple jobs during their initial seagoing assignments, many records contained multiple NOBCs for one tour. Each NOBC record in the data file also contained a corresponding month variable that denoted the duration of time the officer served in the associated NOBC. The author therefore created a new variable (NOBC-primary) that enabled recognition of the billet that the officer occupied for the greater number of months during his or her first tour. In order to determine the initial department assignment for the officer cohorts in the present study, the author first categorized NOBC codes into twelve groups as indicated in Table 4:



Table 4. Navy Officer Billet Classification Code Frequencies and Groupings

| <b>NOBC Group</b>                    | <b>NOBC Dept.</b>             | <b>Frequency</b> | <b>Percent</b> |
|--------------------------------------|-------------------------------|------------------|----------------|
| Anti-Submarine Warfare               | Weapons                       | 277              | 8.6            |
| Gunnery/Ordnance                     | Weapons                       | 263              | 8.2            |
| Fire Control                         | Weapons                       | 230              | 7.2            |
|                                      | Weapons Department Totals     | 770              | 24.0           |
| Combat Information Center Operations | Operations                    | 315              | 9.8            |
| Deck Operations                      | Operations                    | 372              | 11.6           |
| Navigation                           | Operations                    | 57               | 1.8            |
| Communications                       | Operations                    | 416              | 13.0           |
|                                      | Operations Department Totals  | 1160             | 36.2           |
| Auxiliaries                          | Engineering                   | 315              | 9.8            |
| Main Propulsion                      | Engineering                   | 248              | 7.7            |
| Damage Control                       | Engineering                   | 416              | 13.0           |
| Electrical                           | Engineering                   | 172              | 5.4            |
| Nuclear Power                        | Engineering                   | 125              | 3.9            |
|                                      | Engineering Department Totals | 1276             | 39.8           |

Of the 3,206 officers in the data file, 770 (24.0%) initially served in the Weapons (or Combat Systems) Department, 1160 (36.2%) initially served in the Operations Department, and 1276 (39.8%) initially served in the Engineering Department. Appendix B contains a complete listing of NOBC codes and their respective groupings and departments. Since it has the largest representation in the cohort and inport working hours are typically longer for Engineering Department officers, the Engineering Department will serve as the reference department throughout this analysis. Any relationship between initial department assignment and retention will most likely be a weak one, but if one does exist engineers will probably be most likely to leave the Navy due to longer initial working hours.

#### **D. CHAPTER SUMMARY**

This chapter presented a standard logistic regression methodology that the author utilized to analyze the relationship between retention in the Surface Navy and a series of

control and independent variables. Figure 2 summarizes the expected influence of each variable in the proposed retention model:

Figure 2. Summary of Expected Influence of Variables in Retention Model

| <b>Variable</b>       | <b>Reference</b> | <b>Influence</b>           | <b>Strength</b> |
|-----------------------|------------------|----------------------------|-----------------|
| Gender                | Male             | Negative                   | Strong          |
| Ethnic Background     | White            | Positive                   | Weak            |
| Commissioning Source  | USNA             | Positive (OCS only)        | Strong          |
| Undergraduate Major   | Engineering      | Positive                   | Strong          |
| Dependent Status      | Single/No Kids   | Positive (MarDivKids only) | Strong          |
| Prior-Enlisted Status | Non-Prior        | Positive                   | Strong          |
| Year Group            | YG93             | Positive                   | Strong          |
| Initial Homeport      | MIDLANT          | Positive                   | Weak            |
| CRUDES Experience     | Only CRUDES      | Negative                   | Strong          |
| Initial Department    | Engineering      | Positive                   | Weak            |

Although the preceding analysis generally focused on the effect of the above variables on the STAYSWO decision, the following chapter will also examine an officer's decision to laterally transfer from the Surface Navy by utilizing a second regression. Figure 3 describes each dependent variable:

Figure 3. Description of Dependent Variables

| <b>Dependent Variable</b> | <b>Description</b>                                       |
|---------------------------|--|
| STAYSWO                   | Officer is SWO-designated at YCS8                        |
| LATOUT                    | Officer is on active-duty but not SWO-designated at YCS8 |

After this study describes the results of each regression, it will conclude with recommendations for future Navy assignment policies based on the findings of the research.

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## **IV. RESULTS AND ANALYSIS**

Previous chapters reviewed the extensive body of literature pertaining to employee turnover, job satisfaction, human capital theory, and retention in the Surface Navy. They also described the current study's variables and predicted the strength and direction of each variable's influence in the present model. This chapter will utilize the marginal effects calculation described in the preceding chapter to discuss the results of regression analysis conducted to ascertain the determinants of the STAYSWO and LATOUT dependent variables. Since the focus of this study is retention within the Surface Navy, the study will now continue with a thorough analysis of the STAYSWO regression. A brief discussion of the LATOUT regression will then follow to conclude this chapter.

### **A. STAYSWO REGRESSION RESULTS**

Before turning to the specific results of the STAYSWO regression, it is important to accurately describe the dependent variable. As mentioned in the preceding chapter, STAYSWO is a dichotomous variable where 0=not SWO designated and 1=SWO designated at YCS8. Those who are not SWO-designated fall into one of two categories: no longer in the Navy or in the Navy with a designator other than the SWO 111X series. It should be noted that SWO designation and SWO qualification are distinct circumstances. Warrant officers, limited duty officers, and officers who laterally transferred from the SWO community often have obtained SWO qualification and rate wearing the SWO breast insignia. These officers, however, are not SWO designated and are not eligible for SWOCP. Of the 3,206 officers in the data file, 966 (30.1%) are SWO designated at YCS8. The STAYSWO regression model correctly predicts 54.5% of the cases utilizing a cut value of .30. In other words, of the cases with a probability of staying SWO exceeding 30%, the model correctly predicts retention in the Surface Navy 54.5% of the time. Table 5 provides the results of the STAYSWO regression:

Table 5. STAYSWO Regression Results

|                                      | <b>B</b>      | <b>Marg Fx</b> | <b>S.E.</b>  | <b>Sig.</b>  |
|--------------------------------------|---------------|----------------|--------------|--------------|
| <b>Female</b>                        | <b>-0.562</b> | <b>-0.138</b>  | <b>0.154</b> | <b>0.000</b> |
| Ethnicity <sup>1</sup>               |               |                |              | 0.663        |
| AfrAmer                              | 0.024         | 0.006          | 0.141        | 0.868        |
| Hispanic                             | 0.189         | 0.046          | 0.150        | 0.208        |
| Other                                | 0.030         | 0.007          | 0.167        | 0.859        |
| <b>MarDep @ MSR<sup>2</sup></b>      |               |                |              | <b>0.000</b> |
| MarNoKids                            | 0.044         | 0.011          | 0.098        | 0.657        |
| <b>MarDivKids</b>                    | <b>0.571</b>  | <b>0.140</b>   | <b>0.109</b> | <b>0.000</b> |
| <b>Prior Enlisted</b>                | <b>0.459</b>  | <b>0.113</b>   | <b>0.108</b> | <b>0.000</b> |
| <b>Comm. Program<sup>3</sup></b>     |               |                |              | <b>0.000</b> |
| ROTC                                 | 0.061         | 0.015          | 0.098        | 0.531        |
| <b>OCS-Other</b>                     | <b>0.839</b>  | <b>0.206</b>   | <b>0.123</b> | <b>0.000</b> |
| <b>Undergrad Major<sup>4</sup></b>   |               |                |              | <b>0.001</b> |
| PhySci&Math                          | 0.171         | 0.042          | 0.131        | 0.192        |
| <b>BioSci</b>                        | <b>0.712</b>  | <b>0.175</b>   | <b>0.195</b> | <b>0.000</b> |
| <b>SocSci</b>                        | <b>0.263</b>  | <b>0.065</b>   | <b>0.120</b> | <b>0.029</b> |
| Bus-Econ                             | -0.068        | -0.017         | 0.160        | 0.673        |
| <b>Humanities</b>                    | <b>0.529</b>  | <b>0.130</b>   | <b>0.174</b> | <b>0.002</b> |
| <b>Unknown</b>                       | <b>0.247</b>  | <b>0.061</b>   | <b>0.135</b> | <b>0.066</b> |
| Year Group <sup>5</sup>              |               |                |              |              |
| YG94                                 | -0.009        | -0.002         | 0.136        | 0.944        |
| YG95                                 | 0.114         | 0.028          | 0.131        | 0.385        |
| <b>YG96</b>                          | <b>0.226</b>  | <b>0.055</b>   | <b>0.133</b> | <b>0.089</b> |
| YG97                                 | 0.178         | 0.044          | 0.139        | 0.201        |
| <b>Initial Homeport<sup>6</sup></b>  |               |                |              | <b>0.027</b> |
| <b>PACNW</b>                         | <b>-0.450</b> | <b>-0.110</b>  | <b>0.169</b> | <b>0.008</b> |
| SOCAL                                | -0.109        | -0.027         | 0.107        | 0.309        |
| <b>SOUTH</b>                         | <b>-0.339</b> | <b>-0.083</b>  | <b>0.124</b> | <b>0.006</b> |
| HAWAII                               | -0.047        | -0.012         | 0.173        | 0.787        |
| OVERSEAS                             | -0.208        | -0.051         | 0.159        | 0.192        |
| <b>Crudes Experience<sup>7</sup></b> |               |                |              | <b>0.000</b> |
| MoveOut                              | 0.133         | 0.033          | 0.118        | 0.261        |
| <b>MoveIn</b>                        | <b>0.380</b>  | <b>0.093</b>   | <b>0.143</b> | <b>0.008</b> |
| <b>Never</b>                         | <b>-0.507</b> | <b>-0.125</b>  | <b>0.108</b> | <b>0.000</b> |
| Initial Department <sup>8</sup>      |               |                |              | 0.558        |
| Weapons                              | 0.083         | 0.020          | 0.108        | 0.441        |
| Operations                           | 0.096         | 0.024          | 0.095        | 0.309        |
| <b>Constant</b>                      | <b>-1.415</b> | <b>-0.347</b>  | <b>0.160</b> | <b>0.000</b> |

\*\* STAYSWO correct: 54.5% (Cut Value=.30)

\*\* Reference Variables: (1)White (2)Single (3)USNA (4)Engineering (5)YG93 (6)MIDLANT (7)Only Crudes (8)Engineering

## **1. Influence of Control Variables**

With the exception of the ethnic background and year group variables, the demographic and background control variables influence the STAYSWO dependent variable as predicted. Women are 13.8% less likely to remain in the Surface Navy than men. The likely cause of this significant difference is that many women view a career in the Surface Navy and motherhood as inherently incompatible. Another possible cause of this disparity is that women find being a SWO less meaningful than men do and therefore experience lower levels of job satisfaction (Miller & Wheeler, 1992). Officers with children are 14.0% more likely to stay SWO than those officers without children. As expected, having children, not being married, influences officers to remain in the Surface Navy. Those officers with children likely value the financial stability that a career in the Navy provides by ensuring a healthy paycheck each month and extensive medical and dental coverage. Prior-enlisted officers are also 11.3% more likely to stay in the Surface Navy than their peers. Since these officers have considerably more time already invested in their careers, this finding supports previously cited research (Bautista, 1996; Johnson, 1998; Duffy, 2000; Mackin et al., 2002).

As predicted, OCS officers are much more likely to stay SWO than their Naval Academy counterparts. The STAYSWO behavior of ROTC officers does not, however, significantly differ from the decisions made by USNA officers. Engineering majors are also more likely to leave the Surface Navy than most other major groups. Although not statistically significant, only the business and economics major category possess a negative coefficient when compared to the reference engineering major category. The biological sciences, social sciences, humanities, and unknown major groups, however, both significantly and positively influence an officer's decision to remain in the Surface Navy. This influence was most significant for the biological sciences and humanities majors groups, which are 17.5% and 13.0%, respectively, more likely to stay SWO than engineering majors. As previously mentioned, these groups likely perceive a reduced earning power in the civilian sector so they are more likely to continue as SWOs than the engineering majors who perceive the civilian sector offering very lucrative career opportunities.

Of the control variables in the model, only the ethnic background and year group variables fail to significantly influence an officer's STAYSWO decision. Unlike previous SWO retention studies cited in this literature review, no ethnic group is any more likely to remain in the Surface Navy than are white officers. This change is more likely a reflection of increased opportunity for minorities in the civilian sector that mitigates the draw of the already level playing field that hopefully exists within the Surface Navy. Finally, the year group variable does not exert the strong influence on the regression that the previous chapter predicted it would. Only YG96 officers were more likely to remain in the Surface Navy at a statistically significant level than YG93 officers. The marginal effect (5.50%) is small, however, when compared to the marginal effect of other control variables. It should also be noted though that YG95 and YG97 officers possess a positive coefficient although the strength of the relationship to staying SWO is not statistically significant. Based on the low coefficient and the complete lack of statistical significance, this regression indicates that YG94 officers behaved in a nearly identical fashion as YG93 officers behaved with respect to the STAYSWO decision. The regression results as they relate to year group can thus be seen to indicate that SWOCP does not have as strong an effect on retention as analysts hoped it would. If the retention bonus does strongly influence officers to stay in the Surface Navy, this regression analysis would have indicated significant and positive relationships between YG94-97 and retention when compared to YG93. It should be noted, however, that many YG94-96 officers completed their minimum service commitments prior to the inception of SWOCP so the current analysis does not completely account for its effects.

## **2. Influence of Major Independent Variables**

Unlike the relatively accurate predictions made with respect to the influence of the control variables, the "job satisfaction" variables influence the STAYSWO decision in a largely different manner than predicted. Of the three specified variables, only the CRUDES experience variable acts according to the predictions made in Figure 2 of the previous chapter. Since previous SWO retention studies uniformly cited CRUDES experience as a strong predictor of an officer remaining in the Surface Navy, this study expected the same relationship to occur. The regression clearly supported the findings of previous research. When compared to those who had served only in CRUDES platforms

as division officers, those officers who never served in a CRUDES platform are 12.5% more likely to leave the Surface Navy. Since the majority of ships in the Surface Navy are CRUDES platforms, an officer who never served in a cruiser, destroyer, or frigate would be significantly behind his or her peers with respect to the professional experiences associated with CRUDES operations—namely operating within a Carrier Strike Group. It is not surprising then that those without any CRUDES experience are significantly less likely to remain in the Surface Navy.<sup>2</sup>

The STAYSWO regression analysis does, however, reveal one finding that is surprising. Those officers who transferred from a non-CRUDES platform to a CRUDES platform during their division officer tours were 9.3% more likely to stay in the Surface Navy than those who had served only in CRUDES platforms. Initially, career opportunity seems to effectively explain this finding. The SWO community managers often outline the importance of a diverse professional background in ensuring an officer has the repertoire of skills necessary to successfully advance within the community. The officers who had “moved in” to CRUDES would thus have both the amphibious operational experience and the CRUDES experience desired of its officers by the SWO community. If this explanation was the complete one, however, the MoveOut variable should also positively relate to an officer’s likelihood of staying SWO. While the MoveOut variable does have a positive coefficient, the relationship is not a statistically significant one. A more complete explanation could thus be that many officers who moved from a non-CRUDES platform to a CRUDES platform experienced higher levels of job satisfaction in the CRUDES ship and thus were motivated to remain in the Surface Navy since their most recent sea duty experience was a satisfying one. Although this explanation is purely hypothetical, it is consistent with the results of the regression analysis and is worthy of consideration by the SWO community.

The initial homeport variable behaved in nearly the exact opposite manner as this author predicted. Since West Coast homeports are traditionally more popular when midshipmen choose their initial ships, the expectation was that service in these homeports

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<sup>2</sup> Officers without any CRUDES experience are statistically more likely to possess the following characteristics: female, not prior enlisted, African American or Hispanic, ROTC or OCS graduate, and a business/economics major.



would positively relate to junior officers staying SWO. This prediction hinged on the argument that those who received the assignments they desired were more likely to experience high levels of job satisfaction, which would in turn lead to greater organizational commitment. The STAYSWO regression results, however, do not support this argument. In fact, all homeport categories were negatively related to the MIDLANT reference category.<sup>3</sup> Only two categories, PACNW and SOUTH, were significantly related, however, to the STAYSWO variable. Officers who initially served in PACNW (Bremerton, Everett) ships were 11.0% more likely to leave the Surface Navy, and those who initially served in SOUTH (Mayport, Pascagoula, Ingleside) ships were 8.3% more likely to not stay SWO. One possible explanation for the higher percentage of PACNW officers leaving the Surface Navy is that there is disproportionate representation of carriers and CLF ships in Bremerton and Everett. Lower retention as a function of these platforms is consistent with Bautista (1996) since he found that officers initially serving in aircraft carriers were less likely to remain in the Surface Navy.

Explaining the relationship between STAYSWO and SOUTH is more difficult. Of the homeports that comprise the SOUTH grouping, Mayport accounts for 64.3% of the cases, Ingleside accounts for 16.1%, and Pascagoula accounts for 15.2% of the cases. With the exception of two aircraft carriers in Mayport, Mayport and Pascagoula are exclusively CRUDES homeports. Ingleside, however, accounts for nearly 85% of the cases where an officer initially served in a patrol craft or minesweeper. In almost all instances where an officer's initial ship is a patrol craft or minesweeper, he or she would next serve in a CRUDES ship, placing him or her into the MoveIn group for the CRUDES experience variable. As previously discussed the MoveIn group demonstrated a significant and positive effect on STAYSWO. Based on the above arguments, it would be difficult for an officer who began his or her career in the SOUTH group to not gain CRUDES experience. The data set supports this logic as only 14.3% of the officers in the SOUTH grouping never served in a CRUDES ship while 26.3% of the entire data set never served in a CRUDES platform. This discrepancy points to the likelihood that

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<sup>3</sup> Officers who initially served in MIDLANT ships are statistically more likely to possess the following characteristics: female, African American, married without children, OCS graduate, and a biological sciences major.

something about the SOUTH homeports specifically (as opposed to the prevalent ship types in these homeports) makes officers who serve in them less likely to remain in the Surface Navy.

Perhaps the most interesting finding in the initial homeport variable analysis is that those who initially serve in MIDLANT ships are significantly more likely to continue their careers in the Surface Navy than those officers who began their careers elsewhere. Clearly the prediction that homeport popularity with officer candidates will make “popular” homeports more likely to produce career-minded junior officers is incorrect. Norfolk and Little Creek comprise 95.4% of the cases where officers fall in the MIDLANT grouping. The present research thus indicates that officers whose initial assignments are in the Hampton Roads, Virginia area are more likely to remain in the Surface Navy. One possible explanation is that junior officers who are more career-minded choose to live in this area because of the lower cost of living and wide variety of ship types resident in these ports. With the exception of minesweepers, every type of surface ship in the Navy’s inventory can be found in Norfolk or Little Creek. The “variety” argument, however, also holds for San Diego. The lower cost of living in Norfolk and Little Creek might influence young officers seeking to establish a firm financial foundation early in their careers as opposed to those who might be swayed by the “fun in the sun” of California or Hawaii. The former group probably desires a stable career from the outset, thus making them more likely to remain a SWO. Another possible explanation is that since the West Coast homeports are typically more popular, higher ranking midshipmen are more likely to receive these prized orders. These junior officers might perceive that they have higher potential earning power in the civilian sector because of their scholastic success in college. Such a perception would make this group more likely to leave the Surface Navy.

The final independent variable, an officer’s initial shipboard department, did not significantly relate to the STAYSWO decision. This finding is consistent with the findings of Duffy (2000). The lack of a relationship between an officer’s initial department and his or her STAYSWO decision is not surprising. Many officers migrate between departments as junior officers so the NOBC information in the data set might not be entirely accurate. Furthermore, while there is variance between what officers in

different departments do on a daily basis, the day of a junior officer in one shipboard department is more similar than it is different than the day of a junior officer in another department.

## **B. LATOUT REGRESSION RESULTS**

As one would reasonably expect, there are both significant differences and similarities between the STAYSWO regression and the LATOUT regression. After excluding the 966 officers who remained in the Surface Navy past their decision points, 2240 cases remained in the data set. Of these officers, 672 (30%) laterally transferred from the Surface Navy. Nearly all communities accept lateral transfers from the Surface Warfare community. Once junior officers earn their SWO designation they can apply to BUPERS to transfer to the Restricted Line or Staff Corps communities in the Navy. Some also apply to transfer to other Unrestricted Line communities. Since many communities rely on lateral transfers to augment their manning, the Surface Navy must always maintain some cognizance over the types of officers who are likely to transfer. For this reason, the present study includes the LATOUT regression. The LATOUT regression model correctly predicts 63.5% of the cases utilizing a cut value of .30. In other words, of the cases with a probability of lateral transfer exceeding 30%, the model correctly predicts a lateral transfer to another community 63.5% of the time. It should be noted that the LATOUT variable only captures those who laterally transferred—it does not consider retention to YCS8. Table 6 provides the LATOUT regression results:

Table 6. LATOUT Regression Results

|  | <b>B</b>      | <b>Marg Fx</b> | <b>S.E.</b>  | <b>Sig.</b>  |
|--|---------------|----------------|--------------|--------------|
| <b>Female</b>  | <b>0.426</b>  | <b>0.105</b>   | <b>0.150</b> | <b>0.004</b> |
| Ethnicity <sup>1</sup>   |               |                |              | 0.711        |
| AfrAmer  | 0.095         | 0.024          | 0.176        | 0.589        |
| Hispanic   | 0.147         | 0.036          | 0.190        | 0.440        |
| Other  | -0.128        | -0.032         | 0.200        | 0.523        |
| <b>MarDep @ MSR<sup>2</sup></b>  |               |                |              | <b>0.000</b> |
| <b>MarNoKids</b>   | <b>0.559</b>  | <b>0.138</b>   | <b>0.115</b> | <b>0.000</b> |
| <b>MarDivKids</b>  | <b>1.207</b>  | <b>0.298</b>   | <b>0.139</b> | <b>0.000</b> |
| <b>Prior Enlisted</b>  | <b>0.767</b>  | <b>0.190</b>   | <b>0.136</b> | <b>0.000</b> |
| <b>Comm. Program<sup>3</sup></b>   |               |                |              | <b>0.024</b> |
| <b>ROTC</b>  | <b>-0.314</b> | <b>-0.078</b>  | <b>0.115</b> | <b>0.006</b> |
| OCS-Other  | -0.145        | -0.036         | 0.161        | 0.370        |
| <b>Undergrad Major<sup>4</sup></b>   |               |                |              | <b>0.018</b> |
| <b>PhySci&amp;Math</b>   | <b>0.350</b>  | <b>0.087</b>   | <b>0.149</b> | <b>0.019</b> |
| BioSci   | -0.162        | -0.040         | 0.271        | 0.550        |
| SocSci   | 0.089         | 0.022          | 0.144        | 0.536        |
| Bus-Econ   | -0.246        | -0.061         | 0.192        | 0.199        |
| <b>Humanities</b>  | <b>-0.408</b> | <b>-0.101</b>  | <b>0.234</b> | <b>0.082</b> |
| Unknown  | 0.033         | 0.008          | 0.172        | 0.847        |
| <b>Year Group<sup>5</sup></b>  |               |                |              | <b>0.000</b> |
| <b>YG94</b>  | <b>0.765</b>  | <b>0.189</b>   | <b>0.172</b> | <b>0.000</b> |
| <b>YG95</b>  | <b>0.968</b>  | <b>0.239</b>   | <b>0.170</b> | <b>0.000</b> |
| <b>YG96</b>  | <b>1.312</b>  | <b>0.325</b>   | <b>0.170</b> | <b>0.000</b> |
| <b>YG97</b>  | <b>1.255</b>  | <b>0.310</b>   | <b>0.178</b> | <b>0.000</b> |
| <b>Initial Homeport<sup>6</sup></b>  |               |                |              | <b>0.056</b> |
| PACNW  | -0.220        | -0.054         | 0.205        | 0.283        |
| SOCAL  | 0.067         | 0.017          | 0.133        | 0.615        |
| SOUTH  | 0.179         | 0.044          | 0.150        | 0.230        |
| <b>HAWAII</b>  | <b>0.563</b>  | <b>0.139</b>   | <b>0.209</b> | <b>0.007</b> |
| OVERSEAS   | 0.141         | 0.035          | 0.187        | 0.450        |
| <b>Crudes Experience<sup>7</sup></b>   |               |                |              | <b>0.000</b> |
| <b>MoveOut</b>   | <b>-0.505</b> | <b>-0.125</b>  | <b>0.161</b> | <b>0.002</b> |
| MoveIn   | -0.262        | -0.065         | 0.200        | 0.192        |
| <b>Never</b>   | <b>0.260</b>  | <b>0.064</b>   | <b>0.121</b> | <b>0.032</b> |
| Initial Department <sup>8</sup>  |               |                |              | 0.339        |
| Weapons  | 0.144         | 0.036          | 0.133        | 0.281        |
| Operations   | 0.158         | 0.039          | 0.115        | 0.170        |
| <b>Constant</b>  | <b>-2.380</b> | <b>-0.588</b>  | <b>0.208</b> | <b>0.000</b> |
| ** LATOUT correct: 63.5% (Cut Value=.30)   |               |                |              |              |
| ** Reference Variables: (1)White (2)Single (3)USNA (4)Engineering (5)YG93 (6)MIDLANT (7)Only Crudes (8)Engineering |               |                |              |              |

Not surprisingly, women are 10.5% more likely to laterally transfer than men. As previously mentioned, many female officers view a career in the Surface Navy as either being incompatible with the aspiration to start a family or less fulfilling than their male counterparts. Laterally transferring to another community thus provides an opportunity to continue a naval career without the constant demands of sea duty. The same argument holds for officers with dependents. Married officers without children are 13.8% more likely to laterally transfer and officers with children are 29.8% more likely to move to another community. Prior enlisted officers, who have invested more time in their naval careers, also laterally transfer at a higher rate than their peers who gained commissions without prior service.

Naval Academy graduates are also more likely to laterally transfer than their ROTC or OCS counterparts. Although only the ROTC variable's coefficient is statistically significant, both the ROTC and OCS coefficients are negative in comparison to the reference USNA category. The cause of this result is not readily apparent since the Navy obligates both USNA and ROTC graduates to serve either in the Navy's Unrestricted Line communities or the Marine Corps. One possible explanation is that Naval Academy graduates possess a higher taste for the military lifestyle than their ROTC counterparts. The undergraduate major variable also significantly impacts the lateral transfer decision. Although only two coefficients are statistically significant (physical sciences and humanities), three of the five majors groups negatively relate to laterally transferring when compared to the engineering group. Since many of the Restricted Line and Staff Corps involve the every-day application of engineering skill-sets (Engineering Duty Officer and Civil Engineering Corps for example), this finding also makes logical sense. The final control variable, year group, also heavily influences the regression. All year groups in the model are much more likely to laterally transfer than YG93. Most significantly, YG96 and YG97 are 32.5% and 31.0% more likely to laterally transfer than YG93! Perceptions of reduced economic opportunity in the civilian sector and increased patriotism following the 9/11 attacks likely account for the dramatic differences seen in the different YGs. This result reinforces the aforementioned

argument that SWOCP did not have the initial effect that researchers predicted it would. Instead, increases in SWO retention are more likely the result of changing economic conditions and the 9/11 attacks.

Of the independent variables in the model, the CRUDES experience variable influences the LATOUT decision most strongly. Officers with no CRUDES experience are 12.1% more likely to laterally transfer. Officers who moved out of the CRUDES community, however, are 16.1% less likely to laterally transfer than those officers who had only served in CRUDES platforms. Although statistically insignificant, the MoveIn category's coefficient is also negative. Clearly, CRUDES experience correlates to retention in the Surface Navy while a lack of CRUDES experience influences an officer to either leave the Navy or laterally transfer to another community. The initial homeport analysis is, once again, more complicated. In the LATOUT model, HAWAII officers are 13.9% more likely to laterally transfer than MIDLANT officers. Although statistically insignificant, the SOCAL, SOUTH, and OVERSEAS categories also possess positive coefficients. Although purely hypothetical, a possible explanation is that officers who begin their careers in these homeports are typically more competitive to successfully laterally transfer since they would have been higher performing in the first place to be able to obtain orders to more popular homeports.

### **C. CHAPTER SUMMARY**

With the exception of the year group analysis, the control variables in the STAYSWO and LATOUT regressions influence these decisions as predicted. The independent determinants, especially the initial homeport variable, produce much more surprising results. Despite the assumed popularity of West Coast homeports, officers who begin their careers in Norfolk or Little Creek are much more likely to remain in the Surface Navy than their peers. As predicted, CRUDES experience positively influences an officer's decision to continue his or her career in the Surface Navy. The initial department results verify Duffy (2000)'s conclusion that an officer's initial department does not significantly influence his or her career decisions. Since all division officer jobs share a multitude of characteristics, this finding is not surprising. Based on the marginal effects calculations in the STAYSWO regression analysis, the officer most likely to continue his or her career in the Surface Navy possesses the following characteristics:

male, married or divorced with children, prior enlisted, OCS officer, biological sciences major, YG96, MIDLANT initial homeport, and moved into the CRUDES community. By comparison the officer least likely to remain a SWO possesses these characteristics: female, single without children, not prior enlisted, USNA or ROTC graduate, business or economics major, YG93 or YG94, PACNW initial homeport, and never served in the CRUDES community. The concluding chapter of this study will now discuss the implications and limitations of this study and provide recommendations for further study.

## V. CONCLUSION

The preceding analysis examined the influence of both demographic variables and “fleet experience” variables on a junior officer’s decision to remain in the Surface Navy or to laterally transfer to another community within the Navy. The “fleet experience” variables, which include an officer’s initial homeport, initial shipboard department, and the presence and sequencing of CRUDES experience during the division officer tours, partially capture the potential influence of job satisfaction and quality of leadership on the stay/leave decision. While these variables imperfectly approximate such complicated constructs, the study does effectively illustrate the need to consider factors other than demographics, personal background, and financial compensation when analyzing officers’ career decisions. Put simply, retention in the Surface Navy is neither predetermined by an officer’s background nor determined solely by an officer’s satisfaction with his or her paycheck. In other words, what happens in the Fleet matters!

### A. MAJOR FINDINGS OF THE RESEARCH

Of the independent variables in the retention model, the CRUDES experience variable exerted the strongest influence on an officer’s decision to remain in the Surface Navy. Those officers with some CRUDES experience are much more likely to continue their careers as SWOs than those officers who have never served in a CRUDES platform. A myriad of factors likely contribute to this behavioral pattern. The Surface Warfare community often argues that there is “no such thing as a bad ship.” While this author agrees with this sentiment, the present research does indicate that CRUDES experience relates to producing more career-minded officers. The theoretical linchpins of this thesis, the importance of job satisfaction and leadership, would thus lead the analyst to conclude that CRUDES ships engage in more satisfying missions and benefit from better leadership. While this author is admittedly biased based on the nature of his SWO experiences (exclusively CRUDES platforms), officers in CRUDES ships are more likely to have intimate experience with “tip of the spear” operations. Whether as a boarding officer on a maritime interdiction mission, a strike officer conducting Tomahawk strike operations, or as a watch officer engaged in an air defense problem, SWOs in CRUDES ships experience a wide range of high-intensity operations. This argument does not seek,



however, to downplay the importance of non-CRUDES platforms. All ships in the Fleet certainly perform missions that are absolutely critical to the nation's defense. The present argument only implies that the CRUDES navy may attract officers (both junior officers and more senior shipboard leadership) who possess a propensity to pursue a career in the Navy.

Another significant finding in the present study is the surprising result of the initial homeport analysis. Despite the perceived popularity of West Coast homeports (as demonstrated by the high demand for these homeports seen in officer candidates), those officers who initially served in Norfolk or Little Creek ships are more likely to pursue a SWO career. To return to the theoretical foundation of this thesis, this finding could also indicate that more effective leadership is resident at the nation's largest naval base. Another, more tangible, explanation of the MIDLANT effect is that the large number of ships based in the Hampton Roads area allows for greater geographic stability, thus creating a higher quality of life for the officer and improving the likelihood of his choosing to remain in the Surface Navy. A final explanation for the impressive retention record of the MIDLANT homeports spins the popularity argument in a different direction. Since an officer's undergraduate record helps to determine his or her initial orders, those officers with more impressive records are more likely to gain assignments to the more popular West Coast homeports. Conversely, those whose grades and performance were not as impressive initially receive orders to ships in Norfolk. Since these officers may not perceive as much opportunity in the civilian sector, they may be more likely to remain in the Navy.

Finally, the present analysis discovered that SWOCP does not influence the retention decision nearly to the extent that the Surface Navy's leadership had hoped it would. Although SWO retention did increase over the analyzed year groups, only YG96's retention improvement was at a statistically significant level. Coupling this result with the overwhelmingly significant influence of year group on the LATOUT regression leads the prudent researcher to conclude that prevalent economic opportunities and 9/11 effects increased retention, not the creation of SWOCP.

## **B. LIMITATIONS OF THE RESEARCH**

The lack of performance data—both at the undergraduate level and once commissioned—most significantly inhibits the strength of the present analysis. Adding a control variable to the retention model that accounts for undergraduate performance would strength the explanatory power of the model. Much of the initial homeport analysis hinges on the argument that higher performing officer candidates are more likely to choose West Coast homeports. While this reasoning is logically sound, undergraduate performance data would illustrate quantifiable relationships that would make the argument more powerful. Along similar lines, including officer performance data would also increase the predictive power of the retention model. If this study’s literature review is correct, positive performance appraisal increases job satisfaction and organizational commitment. It thus follows that including fitness report data would improve the model. Such an inclusion would also allow community managers to evaluate which officers are remaining in the Surface Navy. Since this analysis has indicated that officers who perceived less opportunity in the civilian sector are more likely to stay in the Surface Navy, it would be incredibly valuable to examine the officer performance trends between those who stay and those who do not.

As mentioned multiple times throughout this analysis, the job satisfaction construct is the theoretical foundation behind the inclusion of the “fleet experience” variables. Again, while logically sound, this argument is, in some respects, a “leap of faith.” The data do prove that certain types of ships and certain homeports improve the likelihood of SWO retention, but there really is not definitive proof that the cause is job satisfaction or differing qualities within the leadership. Only qualitative research can verify this theory.

## **C. RECOMMENDATIONS FOR FURTHER RESEARCH**

To continue to improve the Navy’s understanding of its Surface Warfare Officers’ retention behavior, the author recommends the continuation of the present research as follows:

- Merge performance data into the retention model. As previously discussed, performance data would certainly improve the predictive power of this study’s retention model. Unfortunately, the current fitness report system inhibits the

research since all Navy O-1s and O-2s can receive no higher than a “promote” promotion recommendation. If future researchers could reliably obtain it, advanced qualification data (Engineering Officer of the Watch, Tactical Action Officer) could serve as officer performance approximations.

- Conduct extensive qualitative research that examines fleet experience variables. Survey and focus group data could help to identify varying job satisfaction levels in different ship types, departments, and homeports. Researchers must take care, however, to utilize a wide sample of ships so that they can reliably conclude that trends are based on the fleet experience variables, not specific commands.
- Include survey questions in SWOCP application. The current SWOCP application does not provide the Navy feedback as to why that officer has chosen to remain in the Surface Navy. Carefully crafted questions would allow researchers to better pinpoint why officers want to stay SWO.

**APPENDIX A: INITIAL HOMEPORT FREQUENCIES**

| Homeport             | Frequency | Percent |
|----------------------|-----------|---------|
| <b>MIDLANT</b>       | 1,066     | 33.3    |
| Norfolk, VA          | 912       | 28.4    |
| Little Creek, VA     | 105       | 3.3     |
| Earle, NJ            | 34        | 1.1     |
| Newport News, VA     | 13        | 0.4     |
| Newport, RI          | 1         | 0.0     |
| No Homeport Assigned | 1         | 0.0     |
| <b>PACNW</b>         | 254       | 7.9     |
| Everett, WA          | 129       | 4.0     |
| Bremerton, WA        | 125       | 3.9     |
| <b>SOCAL</b>         | 846       | 26.4    |
| San Diego, CA        | 796       | 24.8    |
| Concord, CA          | 24        | 0.7     |
| Long Beach, CA       | 14        | 0.4     |
| Alameda, CA          | 8         | 0.2     |
| Coronado, CA         | 3         | 0.1     |
| Oakland, CA          | 1         | 0.0     |
| <b>SOUTH</b>         | 554       | 17.3    |
| Mayport, FL          | 356       | 11.1    |
| Ingleside, TX        | 89        | 2.8     |
| Pascagoula, MS       | 84        | 2.6     |
| Charleston, SC       | 22        | 0.7     |
| Corpus Christi, TX   | 2         | 0.1     |
| Orlando, FL          | 1         | 0.0     |
| <b>HAWAII</b>        | 209       | 6.5     |
| Pearl Harbor, HI     | 209       | 6.5     |
| <b>OVERSEAS</b>      | 277       | 8.6     |
| Yokosuka, Japan      | 195       | 6.1     |
| Sasebo, Japan        | 71        | 2.2     |
| Gaeta, Italy         | 11        | 0.3     |

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## APPENDIX B: NOBC FREQUENCIES

| <b>NOBC (NOBC Title)</b>  | <b>Frequency</b> | <b>Percent</b> |
|---|------------------|----------------|
| <b>Anti-Submarine Warfare</b>                                     | 277              | 8.6            |
| 9206 (ASW Weapons Officer)  | 264              | 8.2            |
| 9253 (ASW Division Officer)                                       | 12               | 0.4            |
| 8606 (Aviation Antisubmarine Classification and Analysis Officer) | 1                | 0.0            |
| <b>Combat Information Center Operations</b>                       | 315              | 9.8            |
| 9217 (NTDS CIC Officer)   | 175              | 5.5            |
| 9216 (CIC Officer)  | 89               | 2.8            |
| 9282 (Ship's Electronic Warfare Officer)                          | 22               | 0.7            |
| 9274 (Afloat Operations Officer)                                  | 20               | 0.6            |
| 9851 (Naval Security Group Direct Support Officer--Surface)       | 4                | 0.1            |
| 9227 (General NTDS CIC Officer)                                   | 2                | 0.1            |
| 9640 (Operational Intelligence Officer)                           | 2                | 0.1            |
| 9275 (NTDS Afloat Operations Officer)                             | 1                | 0.0            |
| <b>Gunnery/Ordnance</b>   | 263              | 8.2            |
| 9252 (Gunnery Division Officer)                                   | 236              | 7.4            |
| 9250 (General Weapons Division Officer)                           | 15               | 0.5            |
| 9258 (General Weapons Officer)                                    | 9                | 0.3            |
| 9202 (Gunnery/Ordnance Officer)                                   | 3                | 0.1            |
| <b>Fire Control</b>   | 230              | 7.2            |
| 9237 (General Fire Control Officer)                               | 64               | 2.0            |
| 9246 (General Strike Warfare Officer)                             | 63               | 2.0            |
| 9247 (Surface-to-Air Missile Strike Warfare Officer)              | 46               | 1.4            |
| 9283 (Ship's Electronic Material Officer)                         | 38               | 1.2            |
| 9238 (Surface-to-Air Missile Fire Control Officer)                | 18               | 0.6            |
| 9254 (Guided Missiles Division Officer)                           | 1                | 0.0            |
| <b>Deck Operations</b>  | 372              | 11.6           |
| 9242 (First Lieutenant)   | 363              | 11.3           |
| 9278 (Ship's Boatswain)   | 7                | 0.2            |
| 9343 (UNREP Equipment Maintenance Officer)                        | 2                | 0.1            |
| <b>Navigation</b>   | 57               | 1.8            |
| 9284 (Ship's Navigator)   | 50               | 1.6            |
| 9255 (General Surface Ship Watch Officer)                         | 3                | 0.1            |
| 2605 (Administrative Assistant)                                   | 2                | 0.1            |
| 2615 (Administrative Officer)                                     | 1                | 0.0            |
| 9286 (Ship's Secretary)   | 1                | 0.0            |
| <b>Auxiliaries</b>  | 315              | 9.8            |
| 9302 (Auxiliary Machinery Officer)                                | 315              | 9.8            |

| <b>NOBC (NOBC Title)</b>  | <b>Frequency</b> | <b>Percent</b> |
|---|------------------|----------------|
| <b>Main Propulsion</b>  | 248              | 7.7            |
| 9337 (Gas Turbine Main Propulsion Assistant)  | 100              | 3.1            |
| 9341 (Steam Main Propulsion Assistant)  | 61               | 1.9            |
| 9305 (Boiler Officer)   | 35               | 1.1            |
| 9384 (Steam Main Engine Officer)  | 34               | 1.1            |
| 9336 (Diesel Main Propulsion Assistant)   | 14               | 0.4            |
| 9306 (1200psi Steam System Boiler Officer)  | 2                | 0.1            |
| 9335 (General Main Propulsion Assistant)  | 1                | 0.0            |
| 9364 (Gas Turbine Ship's Engineer Officer)  | 1                | 0.0            |
| <b>Damage Control</b>   | 416              | 13.0           |
| 9308 (Damage Control Assistant)   | 360              | 11.2           |
| 9348 (Repair Division Officer)  | 56               | 1.7            |
| <b>Electrical</b>   | 172              | 5.4            |
| 9353 (Ship's Electrical Officer)  | 172              | 5.4            |
| <b>Nuclear Power</b>  | 125              | 3.9            |
| 9371 (Nuclear Ship's Engineer Officer)  | 47               | 1.5            |
| 9393 (Ship's Reactor Mechanical Assistant)  | 31               | 1.0            |
| 9394 (Ship's Reactor Control Assistant)   | 18               | 0.6            |
| 9374 (Nuclear Ship's Engineer Officer--Electrical)  | 18               | 0.6            |
| 9373 (Nuclear Ship's Engineer Officer--Damage Control)  | 6                | 0.2            |
| 9372 (Nuclear Ship's Engineer Officer--Main Propulsion)   | 5                | 0.2            |
| <b>Communications</b>   | 416              | 13.0           |
| 9582 (Information Systems Officer)  | 380              | 11.9           |
| 9745 (ADP Systems Maintenance Officer)  | 18               | 0.6            |
| 9585 (No Longer Listed)   | 7                | 0.2            |
| 9535 (CMS Material Custodian)   | 5                | 0.2            |
| 9705 (ADP Systems Director)   | 4                | 0.1            |
| 9595 (Communications Traffic Officer)   | 2                | 0.1            |
| **Manual of Navy Officer Manpower and Personnel Classifications (NAVPERS 15839I) provides description of each NOBC's duties |                  |                |

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