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THESIS

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SURFACE WARFARE ATTRITION:
DOES SHIP TYPE MAKE A DIFFERENCE?

by

William James Kear

December 1989

Thesis Co-Advisors: Richard S. Elster
 Mark J. Eitelberg

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Surface Warfare Attrition:
Does Ship Type Make a Difference?

by

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Lieutenant Commander, United States Navy
B.S., United States Naval Academy, 1977

Submitted in partial fulfillment of the
requirements for the degree of

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from the

NAVAL POSTGRADUATE SCHOOL
December 1989

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ABSTRACT

This thesis seeks to determine if there is a relationship between ship type and first-term enlisted attrition in the Surface Warfare Navy. The data used in this thesis were taken from the Department of Defense (DOD) Enlisted Master Record (EMR). Information on male sailors aboard ships with 33 months or less of completed service was extracted from the EMR. Three cohorts were examined--those who joined their first ship in fiscal 1977, 1981, and 1985, respectively. A total of 77,502 personnel serving in 300 ships were analyzed in three data formats: individual ship, ship class, and ship mission category. The results revealed wide variation in attrition rates between individual ships and respective ship classes across different cohorts. In addition, a distinct trend in attrition was observed between ships in different mission categories. For example, oilers generally had the highest rate of attrition across all three cohorts--followed (in order) by amphibious ships, minesweepers, and repair ships with cruisers, destroyers, and frigates having the lowest rate. Further research is recommended to determine the causes for differences in attrition between ship types. Understanding this aspect of enlisted attrition may further aid Navy

manpower planners and leaders in reducing personnel attrition and its consequences for the Surface Warfare Navy.

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I. INTRODUCTION

A. PROBLEM

Navy manpower requirements are becoming increasingly difficult to meet. The All-Volunteer Force (AVF), given proper funding by Congress, was to solve many problems that had developed under the draft. Enlisted attrition rates were expected to fall from a Vietnam-era peak of 28 percent to a projected 23 percent by 1977 upon completion of the transition to an all-voluntary military. Even more optimistic was the President's Commission on an All-Volunteer Armed Force (or Gates Commission), which forecasted an attrition rate as low as 15 percent under the AVF. At the same time, retention rates were expected to rise along with the number of careerists [Ref. 1:p. 24].

In 1969, the Gates Commission also predicted that the military would have to take a large proportion of low aptitude recruits during the AVF transition and that the services would experience early deficits in manpower end-strengths. Yet, as Cooper notes, the fact that neither of these happened provides "some indication that the problems of transition have been fewer than originally anticipated." [Ref. 2:p. 387] During a conference on the future of the AVF held at Annapolis, Maryland in 1983, Secretary Defense Caspar Weinberger observed that,

...least part of the criticism levelled against our All-Volunteer Force was really just a smoke screen. Behind the smoke screen was a basic unwillingness to pay the price of giving our Armed Forces decent compensation for their contribution to their nation's security. Then there was fear that we could not attract enough educationally qualified people unless we had a draft--that fear has been completely dispelled by the facts. [Ref. 3:p. 2]

While many of the benefits forecasted by original AVF proponents have been realized, attrition remains a perplexing problem and one that has worsened as this decade comes to a close. The question remains: what is the best way for Navy manpower planners, recruiters, and unit commanders to maximize their resources to reverse first-term attrition within the Navy?¹ To make matters worse, the population of young adults will continue to decline through the mid-1990s--acting to intensify competition between the military, employers, and colleges [Ref. 5:p. 13]. With this smaller pool of young adults in the population available for reenlistment, there is even greater interest in seeing that enlistees successfully complete their first term.

In an effort to define and investigate one aspect of the attrition issue, this study seeks to determine if there is a relationship between first-term enlisted attrition and ship type. The results of the research should help to clarify

¹ Elster and Flyer define attrition as "separation or discharge from military service prior to tour completion." [Ref. 4: p. 11] Recruits may sign enlistment contracts of varying length up to six years.

current understanding of personnel attrition in the Navy and provide greater insight for developing appropriate policy.

B. BACKGROUND AND LITERATURE REVIEW

Since the end of the draft, there has been extensive analysis of the attrition issue. Manpower experts have concerned themselves not only with the causes but with the effects on this growing problem on fleet readiness.

A number of factors have been examined and found to be related in some way to attrition. First and foremost, there appears to be general agreement that recruits who are high school diploma graduates (HSDGs) are almost twice as likely to complete their first enlistment than are those who do not graduate from high school [Ref. 7:p. 2]. In addition, as Cooke and Quester observe, there is also a strong relationship between attrition and aptitude test scores:

Aptitude, as measured by the Armed Forces Qualification Test (AFQT) scores and resulting AFQT category classification, is negatively related to early attrition. Recruits with high aptitude generally qualify for the most valuable technical training the Navy offers, which may increase their job satisfaction and reduce attrition propensity. [Ref. 7:p. 2]

However, Elster and Flyer add that the "validity of AFQT in predicting attrition varies for different population subgroups. For example, it is less valid for NON-HSDGs and blacks." Additional demographic factors, such as age, sex, race, and marital status, are likewise related to attrition. [Ref. 4:pp. 66-67]

Several studies have shown that older recruits (over age 20) are more likely to separate before completing their term of enlistment than younger recruits. For instance, Buddin found that "early attrition increases about one percentage point per year for each year beyond age 17 at enlistment." Additionally, he found that prior work experience before enlistment influences attrition, "although the magnitude and significance of the effects vary somewhat." Navy enlisted personnel are four-to-five percent "more likely" to leave during the first six months if they have a period of unemployment the year before they enlist. [Ref. 8:pp. 6-7]

A study by Smith and Kendall found a relationship between attrition and assignment to the Navy's GENDET (General Detail personnel with no formal training outside boot camp) positions. As the authors point out, "GENDETS separated from the Navy early much more frequently than NONGENDET personnel." The differences were significant with over 61 percent of the GENDETS leaving the Navy in 34 months compared with 15 percent of the NONGENDETS. [Ref. 9:p. 77] Quester and Cooke hypothesize that this may be occurring in part because "the GENDET work environment is inherently less satisfying than the environments of those receiving skill training."

The Navy Personnel Research and Development Center (NPRDC), San Diego, CA has done extensive research on the personal and organizational determinants of enlisted attrition. A 1979 NPRDC study found that of an experimental

group of 636 sailors who separated from the Navy early, a majority said their decision to separate was based upon the following grievances (in order of importance):

- family or personal problems.
- general dissatisfaction with Navy life.
- lack of freedom and independence.
- dissatisfaction or lack of interest in the entry job.
[Ref. 10:p. 16]

However, very little research has focused on the possible relationship between first-term enlisted attrition and ship type within the surface Navy. There are a few notable efforts in this direction. For example, Cooke and Quester examined the first-term enlisted attrition of Navy recruits from 1985 through 1988 within Atlantic and Pacific naval air forces (AIRLANT/AIRPAC), surface ship forces (SURFLANT/SURFPAC), and submarine forces (SUBLANT/SUBPAC). The results showed a trend of increasing attrition among both Atlantic and Pacific combatants from 1985 to 1988. SURFLANT combatants discharged an average of 6.15 personnel in 1988, while SURFPAC combatants discharged an average of 5.64 personnel. The number of annual first-term losses among SURFLANT surface combatants increased by 48 percent between 1985 and 1987--compared with an increase of 75 percent in the total fleet over the same period. Although the analysis by Quester and Cooke concludes that attrition is up during the 1985 through 1988 period in both SURFLANT and SURFPAC, no conclusions are drawn regarding any

possible relationship between attrition and specific ship classes. The study used the Center for Naval Analyses (CNA) Enlisted Master Record (EMR) to track file records. A list of all SURFLANT Unit Identification Codes (UICs) was considered. Only surface combatants were considered in SURFPAC. All those who left the Navy with less than 33 months on board ship were included in unit attrition statistics. The authors computed individual unit loss rates by dividing first-term attrition losses for each year by the average number of enlisted personnel on board each unit with less than 33 months on active duty aboard the unit. [Ref. 6:pp. 2-6]

A Master's thesis by C.G. Carlson examined the various factors affecting first-term attrition from Navy ships. A total of 554 ships (divided into 39 classes) was considered. This study included submarines and aircraft carriers. It also included both active and reserve ships. The data were extracted from the Survival Tracking File (STF) by UIC. Carlson attempted to determine the relationship between ship type and attrition; however, the results were inconclusive. To draw distinctions between the ship classes, Carlson examined the average underway time (i.e., time spent at sea) of each ship class. He found that nuclear submarines, while maintaining a high operational tempo (op tempo) with long periods at sea, have relatively low attrition. He recognizes that other factors unique to the nuclear submarine force weigh heavily in keeping submarine attrition low. Aircraft carriers

reflected high relative attrition (11.45 percent), as did destroyer tenders (ADs) with comparatively little underway time (12.4 percent attrition). On the whole, the results suggested that smaller ships appear to have lower attrition rates than larger ships. By analyzing the attrition data by ship class as well as by individual UIC, Carlson also attempted to control for other variables by "looking at ships with similar crew size, engineering plant, age, weapons suite, mission, habitability, and cohort distribution over time." [Ref. 4:p. 43] The Carlson study did not analyze attrition distributions by occupation (or ratings) across ship classes or types. Nor did the study delve deeply into the educational levels of attrition losses from specific ship classes. Carlson's study also revealed attrition peaks and valleys in individual ships. (This is probably explained by reasons external to ship class--such as homeport, commanding officer leadership, command climate, ship performance, or morale.) While the author drew no conclusions across ship class, he did conclude that while "some disparities among ships of the same class exist, the attrition rates are close to each class average." [Ref. 11:pp. 34-46]

Other attrition studies have only scratched the surface of the research question pursued in this analysis. The Smith and Kendall effort, for example, introduced variables to see if attrition were higher for those whose initial duty assignments were at shore commands or at sea in ships. In answering this

fundamental question, the authors observed that "personnel who were assigned to shore stations had the highest attrition rates (over 37 percent vs. 21 percent for ship duty)." As illustrated in Figure 1, Smith and Kendall concluded that "initial assignment to shore-duty stations (as opposed to sea duty) appears to increase the risk of attrition." [Ref. 9: pp. 74-77] Similar studies suggest the same relationship of sea/shore assignment to attrition.

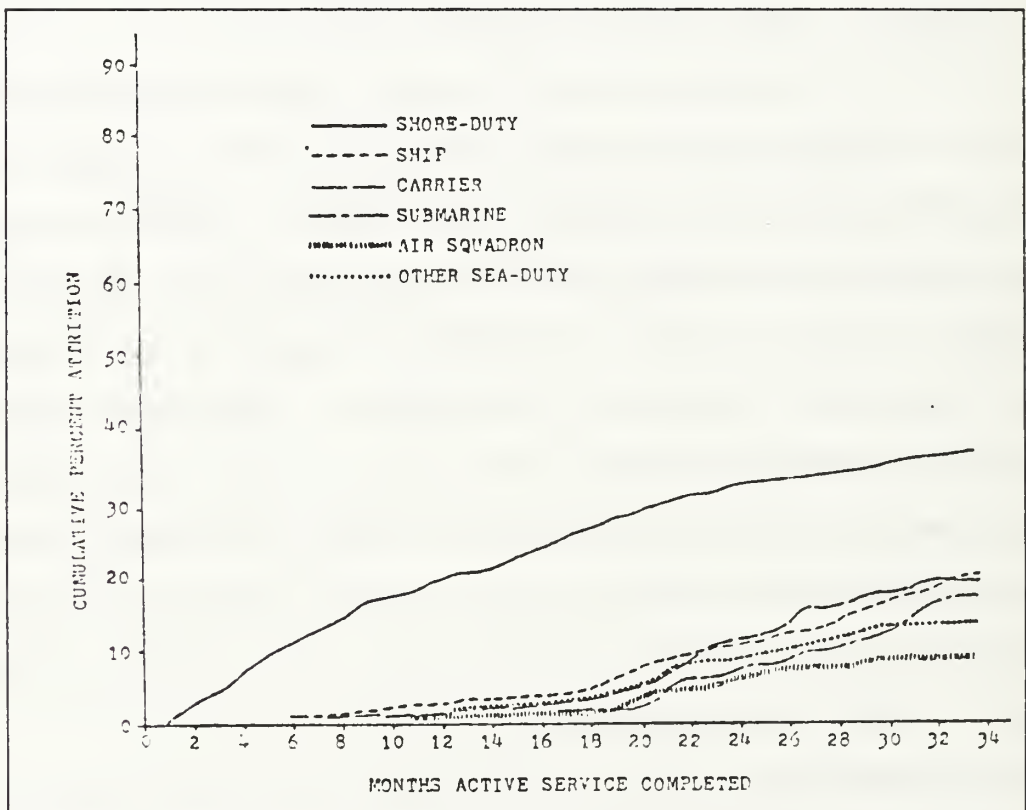


Figure 1. Attrition Over Time by Initial Fleet Duty Assignment [Ref. 9:p. 76]

C. OBJECTIVE

With dwindling dollars for defense and a shrinking population of "baby busters," military leadership must explore all aspects of the manpower issue--not only to recruit but to retain fully qualified personnel. During the last decade, over one-third of first-term Navy enlistees failed to complete their enlistment. This rate of attrition is growing and now approaching a staggering 40 percent. Thus, every avenue must be explored to unravel the causes so that solutions may be found and implemented. Attrition will always exist. It is a reality. But at current levels, the costs and overall effect on readiness are too great. The military, unlike the private sector, is unique in that its ranks are manned initially by teenagers who have little or no previous job experience. The Navy does not recruit mid-level or senior enlisted leaders. It "grows" them from their first enlistment. Therefore, if the Navy misses that narrow window to recruit the necessary talent to maintain a quality force for the future, the opportunity is lost. Of equal importance is to ensure that those who enter the Navy are given every possible opportunity to succeed.

This thesis seeks to determine if there is a relationship between ship type and first-term enlisted attrition in the surface warfare Navy. Drawing upon the DOD Enlisted Master File maintained by the Defense Manpower Data Center (DMDC), data are matched with information on over 300 ships.

Attrition behavior is examined for three cohorts: those who joined their first ship in fiscal 1977, 1981, and 1985, respectively. Individuals are tracked for 33 months from the date of enlistment.

Chapter II outlines the research methodology in detail and summarizes the ship classes considered as well as the key distinctions between them. Chapter III provides data analysis to determine possible trends in ships or ship classes that may lead to a positive relationship between ship type and first-term enlisted attrition. Chapter IV summarizes relevant findings and recommendations in view of the research results.

II. METHODOLOGY

This chapter describes the data sources, population, variables, and the programming technique used in the study. The various constraints and limitations of the data analysis are also discussed. The key distinctions between the 36 ship classes are then outlined to set the stage for Chapter III.

A. PROCEDURE

The data used in this thesis were taken from the Department of Defense (DOD) Enlisted Master Record (EMR), maintained by the Defense Manpower Data Center (DMDC), Monterey, CA. Information on male sailors aboard ships with 33 months or less of completed service was extracted from the EMR and used in the analysis. Three cohorts were examined--enlisted personnel who joined their first ship in fiscal 1977, 1981, and 1985, respectively. Utilizing the same methodology in an earlier study, Cooke and Quester justify their selection of a similar population:

All non-prior service recruits have at least a three-year obligation so that any discharge at or before 33 months of service is a loss of obligated service to the Navy. Separation within three months of contract expiration is at the convenience of the government, permitting individuals to request an early out up to 90 days before their contract expiration. [Ref. 6:p. 2]

Using ten variables from a field of over 100 available in the EMR, data were extracted for tabulation and comparison

across ships, ship classes, and general ship mission categories. Entry variables into the EMR are listed as follows:

- Service Branch.
- Unit Identification Code (or UIC, a ship identifier).
- Sex.
- Educational Level.
- Reason for Loss (Separation Code).
- Date of Separation.
- Occupation Code (or Navy rating).
- Age.
- AFQT.
- Race.

Information provided by OP-122 (Navy Manpower Programs and Support Branch, Washington, D.C.) was used to construct a data file on over 300 ships, incorporating the following five variables:

- Unit Identification Code (UIC).
- Ship Name.
- Hull Number.
- Category/Class.
- Average crew size.

Additional information on ship class was obtained from Jane's Fighting Ships. This included the number of ships in the class as of fiscal 1978, 1982, and 1986; the propulsion system (Nuclear, Gas Turbine, Diesel, Steam); and the general

weapons capability (Guns, Missiles, Torpedos) of the ship. The average age (in years) of each ship class was also calculated using information on each ship's commissioning date in Jane's. The data provided by OP-122 aided in matching UICs with ship names and hull numbers. Utilizing PL/1 (Programming Language 1), DMDC incorporated two software programs to extract and recode information from the EMR, and merge EMR data with the OP-122 data file.

B. VARIABLE EXPLANATION

The UIC represents a key element in this research, since the objective is to determine if a possible relationship exists between ship type (as identified from the EMR by UICs) and first-term enlisted attrition.

Women were not included in this study. By restricting the study to men, an effort was made to compare "apples with apples" across all ship classes. The inclusion of women in this study would inflate first-term attrition figures on the relatively few ships partially manned by them. As Elster and Flyer point out, this is due, in part, because "large numbers of women are separated for pregnancy reasons during their first three years of service." [Ref. 4:p. 19]

The educational level (HSDG vs. NHSDG/GED) of those that separated early from the Navy is also extracted from the EMR to note any possible relationship to ship class. Likewise, a breakdown of reasons for separation and the ratings

(occupation) of those that separated early are tabulated to study any possible correlation with ship type. Also examined across ship types are average Armed Forces Qualification Test (AFQT) scores, average crew member age, and distribution by race (white, black, Hispanic, and other).

This study compares loss rates by ships, ship classes, and ships of similar mission capability (i.e., cruiser/destroyers vs. amphibious ships vs. minesweepers vs. oilers). "Loss rate" is defined as the number of individuals in a particular ship or ship class who separate early from the Navy, divided by the total number that reported aboard with less than 33 months active duty in 1977, 1981, and 1985. Attrition cases are limited to those serving in their initial ship assignment and having less than 34 months on active duty.

Average crew sizes are based upon fiscal 1988 manning levels in naval ships, as provided by OP-122. The final variable considered is average underway steaming time as defined by the average number of days-per-year a ship spends underway at sea. These data were provided by the Center for Naval Analyses and are available for each ship class for one year during each of the three cohort periods being examined. This variable represents a partial measurement of how the operating frequency of a ship or ship class may or may not influence attrition.

With the exception of minesweepers, only active-duty naval ships were considered in this study. This exception was made

to permit a comparative look at the minesweeper force where, unlike other ship classes, the vast majority of minesweepers (18 of 21) are in the Naval Reserve Force (NRF). Unlike larger naval ships in the reserve force that have a reduced manning level of 60-65 percent of active-duty ships within the same class, reserve minesweepers (MSOs) are manned to approximately 70-75 percent of active duty MSOs. In the minesweeper class only, active-duty MSOs (3 of 21) were eliminated from the analysis due to higher manning levels.

C. CONSTRAINTS OR LIMITATIONS

In the documentation of attrition by ratings, a designated "striker" (a GENDET who is working through correspondence courses and on-the-job training to achieve a particular occupation code or rating) may separate before completing his term of enlistment and before his newly-achieved rating code is administratively documented into the EMR. This loss statistic may be counted against total GENDET attrition statistics when it should be included in the occupation or rating statistics of the sailor's newly acquired rating. Consequently, GENDET attrition figures may be somewhat higher, and rating attrition figures (in ratings where designated strikers are permitted) may be somewhat lower than are actually the case. This problem probably does not distort comparisons made here when the attrition rates of ships are examined for the same rating.

As previously observed, average crew sizes by ship class were provided by OP-122 based upon fiscal 1988 manning levels. It should be noted that crew sizes have fluctuated over the years with modifications to weapons and other shipboard systems that require increased or decreased manning. Second, as ships become older, manning may increase because of increased manpower required to maintain aging systems such as a ship's engineering plant. Furthermore, total Navy manpower end strengths will also influence shipboard manning distribution resulting in rating surpluses or shortages in individual rating manning levels.

D. SHIP-TYPE CHARACTERISTICS

Before examining the loss rate data in Chapter III, it is helpful to review the unique mission capabilities and characteristics of the 36 ship classes considered here. This information can aid in identifying possible links that may exist between ship type and first-term enlisted attrition.

In this section, ship classes are examined by broad mission capability and numbers of ships within each class. In highlighting key differences, Table 1 outlines average crew sizes, average yearly underway operating time, type of propulsion system, general weapons capability, and average age of each ship class.

Aircraft carriers and amphibious helicopter carriers were not included in the analysis. Carriers have a rather unique

rating structure with large numbers of aviation-rated personnel. Therefore, comparisons with the majority of other surface ships that have no or relatively small aviation capability would be difficult.

Similar ship classes have similar broad mission requirements, described as follows:

CGN 9, 25, 35, 36, and 38 classes: CGN-Guided missile cruiser (nuclear).

CG 16, 26, and 47 classes: CG-Guided missile cruiser.

Mission: to destroy enemy aircraft, missiles, submarines, and surface ships in order to prohibit the employment of such forces against U.S. forces. Cruisers will normally be assigned to carrier battle groups or surface action groups. [Ref. 12]

DDG 2, 37, and 993 classes: DDG-Guided missile destroyer.

Mission: to provide anti-air, anti-surface, and anti-submarine self-defense and to provide local area protection to carrier battle groups, surface action groups, amphibious groups, underway replenishment groups, and other military shipping against air, surface, and sub-surfaces threats. [Ref. 12]

FFG 1 and 7 classes: FFG-Guided missile frigate.

Mission: to provide anti-air, anti-surface, and anti-submarine self-defense and to provide local area protection to underway replenishment groups, amphibious groups, and other military shipping against sub-surface, air, and surface

threats. The class may also make a limited contribution to carrier battle group or surface action group defense by temporarily supplementing more capable battle group assets. [Ref. 12]

FF 1052 class: FF-Fast frigate.

Mission: to provide anti-air, anti-surface, and anti-submarine self defense and to provide local area protection to underway replenishment groups, amphibious groups, and other military shipping against sub-surface and surface threats. The class can also provide naval gunfire support and make a limited contribution to carrier battle group or surface action group defense by temporarily supplementing more capable battle group assets. [Ref. 12]

LPD 1 and 4 classes: LPD-Amphibious Transport Dock.

Mission: to transport and land troops and their essential equipment and supplies by means of embarked landing craft or amphibious vehicles augmented by helicopter lift. [Ref. 12]

LKA 113 class: LKA-Amphibious cargo ship.

Mission: to transport and land combat equipment and material with attendant personnel in amphibious operations. [Ref. 12]

LSD 32, 36, and 41 classes: LSD-Dock landing ship.

Mission: to transport and launch loaded amphibious craft and vehicles with their crews and embarked personnel in amphibious assault by landing craft and amphibious vehicles.

LSDs will also render limited docking and repair service to small ships and craft. [Ref. 12]

LST 1179 class: LST-Tank landing ship.

Mission: to transport and land amphibious vehicles, tanks, combat vehicles, and equipment in amphibious assault. [Ref. 12]

LCC 19 class: LCC-Amphibious command ship.

Mission: to serve as a command ship for an amphibious task force, landing force, and air control group commanders during amphibious operations. [Ref. 12]

AE 21, 23, and 27 classes: AE-Ammunition ship.

Mission: as elements of the Combat Logistics Force, to support sustained combat operations at sea by naval task groups. By providing logistics support and ammunition to all classes of surface combatants, AEs will make task groups as independent as possible of overseas sources of ammunition supply. [Ref. 12]

AFS 1 class: AFS-Combat store ship.

Mission: as elements of the Combat Logistics Force, to support sustained combat operations at sea by naval task groups. AFSs support warfare tasking by providing repair/spare parts support and refrigerated and non-refrigerated consumables. Additionally, AFSs are capable of simultaneously providing refrigerated stores, general stores, fleet freight, mail and personnel to all classes of surface combatants. [Ref. 12]

AO 98 class: AO-Oiler.

Mission: to operate as units of an Underway Replenishment (UNREP) Group shuttling fuel, freight, and personnel to the fleet at sea. [Ref. 12]

AO 177 class: AO-Oiler.

Mission: to operate as units of an Underway Replenishment (UNREP) Group shuttling fuel, freight, personnel, and ammunition to the fleet at sea. [Ref. 12]

AOE 1 and AOR 1 classes: AOE-Fast Combat support ship. AOR-Replenishment oiler.

Mission: as an element of the Combat Logistics Force, to support sustained combat operations at sea by naval task groups. AOE's and AOR's are equipped with modern replenishment transfer equipment and a full aviation capability for vertical replenishment of stores, ammunition, and fuel to all classes of surface combatants. [Ref. 12]

MSO 427 and 509 classes: MSO-Ocean minesweeper.

Mission: to provide mine warfare surface ship and neutralization countermeasures, and to effectively provide protection to surface battle groups, amphibious groups, and other military shipping against mining threats. [Ref. 12]

AD 15, 37, 41 classes and AR 5 class: AD-Destroyer tender. AR-Repair ship.

Mission: as an element of the Combat Logistics Force, to support sustained combat operations at sea by naval task groups. AD's and AR's provide ship repair and logistic support

facilities. Normally operating near the battle group, the AD/AR will moor or anchor in a safe haven to provide battle damage repair and intermediate maintenance to surface combatants. The AD has limited aviation capability, providing personnel and parts support to ships within the embarked flight radius. [Ref. 12]

Table 1 further highlights ship class distinctions by summarizing unique characteristics. 170 ships are cruisers, destroyers, or frigates; 55 are amphibious ships; 36 are oiler or ammunition ships; 18 are minesweepers; and eight are repair ships. As of fiscal 1978, cruiser, destroyer, and frigate class ships had the lowest average age (9.3 yrs), followed by amphibious ships (9.9 yrs), oilers and ammunition ships (14.5 yrs), and repair ships (26.4 yrs). In fiscal 1986, average ship class ages continued to be lowest among cruisers, destroyers, and frigates (14.9 yrs), followed by amphibious ships (17.9 yrs), oilers and ammunition ships (20.8 yrs), repair ships (26.8 yrs), and minesweepers (30.5 yrs). Table 1 also highlights average yearly days underway for one year during each of the three cohort periods. Cruisers, destroyers, and frigates have the highest average operating time at sea, followed by oilers, amphibious ships, minesweepers, and repair ships. Repair ships have the largest average crew size (1059), while minesweepers have the smallest (56). Clearly, cruisers, destroyers, and frigates represent the greatest weapons capability, as required to fulfill their

mission statements. Most other ship classes have only guns, primarily for self-defense in a hostile environment.

TABLE 1

SHIP CLASS CHARACTERISTIC MATRIX

Ship Class	# of ships in class (a)		Avg. age of ship class (b)		Avg. yearly days underway (c)		Avg. crew size(d)	Propulsion System (e)	Weapons Capability (f)				
	FY78	FY82	FY86	FY86	FY78	FY82			Guns	Missiles	Torpedos		
CGN 38	3	4	0.4	3.5	7.5	118	132	113	359	Nuclear	Yes	Yes	Yes
CGN 36	2	2	3.2	7.2	11.2	139	127	87	579	Nuclear	Yes	Yes	Yes
CGN 35	1	1	10.3	14.3	18.3	159	185	196	566	Nuclear	Yes	Yes	Yes
CGN 25	1	1	15.0	19.0	23.0	147	98	146	529	Nuclear	Yes	Yes	Yes
CGN 9	1	1	16.0	20.0	24.0	165	(g)	167	736	Nuclear	Yes	Yes	Yes
CG 47	(h)	4	NA	NA	1.0	NA	NA	152	340	Gas Turbine	Yes	Yes	Yes
CG 26	9	9	11.3	15.3	19.3	104	153	130	444	Steam	Yes	Yes	Yes
CG 16	9	9	14.0	18.0	22.0	151	140	115	397	Steam	Yes	Yes	Yes
DDG 993	(h)	4	NA	0.1	4.0	(b)	95	129	318	Gas Turbine	Yes	Yes	Yes
DDG 37	10	10	16.7	20.7	24.7	117	110	124	376	Steam	Yes	Yes	Yes
DDG 2	23	23	15.1	19.1	23.1	120	139	111	339	Steam	Yes	Yes	Yes
DD 963	16	30	0.5	3.8	7.7	98	140	130	310	Gas Turbine	Yes	Yes	Yes
FFG 1	6	6	10.2	14.2	18.2	137	116	87	254	Steam	Yes	Yes	Yes
FF 1052	46	46	6.0	10.0	14.0	138	143	129	270	Steam	Yes	No	Yes
FF1040	10	10	11.0	15.0	19.0	136	128	104	260	Steam	Yes	No	Yes
FFG 7	1	21	0.1	0.6	2.9	114	109	118	195	Gas Turbine	Yes	Yes	Yes
LPD 1/4	13	13	10.0	14.0	18.0	133	139	121	400	Steam	Yes	No	No
LKA 113	5	5	8.1	12.1	16.1	132	85	126	336	Steam	Yes	No	No
LSD 32	8	8	21.7	25.7	29.7	107	130	105	329	Steam	Yes	No	No
LSD 36	5	5	6.4	10.4	14.4	138	130	101	331	Steam	Yes	No	No
LSD 41	(h)	2	NA	NA	0.1	NA	NA	145	322	Diesel	Yes	No	No
LST 1179 _c	20	20	6.6	10.6	14.6	130	136	115	241	Diesel	Yes	No	No
LCC 19	2	2	6.8	10.8	14.8	134	110	133	771	Steam	Yes	No	No

TABLE 1 (CONTINUED)

Ship Class	# of ships in class (a)		Avg. age of ship class (b)		Avg. yearly days underway (c)		Avg. crew size(d)	Propulsion System (e)	Weapons Capability (f)				
	FY78	FY82	FY86	FY78	FY82	FY86			Guns	Missiles	Torpedos	Ship	
													FY78
AE 21	2	2	20.7	24.7	28.7	86	139	125	347	Steam	Yes	No	No
AE 23	3	3	18.1	22.1	26.1	126	90	79	330	Steam	Yes	No	No
AE 27	7	7	6.5	10.5	14.5	96	150	110	386	Steam	Yes	No	No
AE 31	7	7	8.8	12.8	16.8	107	139	113	441	Steam	Yes	No	No
AO 98	3	3	32.0	36.0	40.0	155	101	83	352	Steam	Yes	No	No
AO 177	(h)	3	NA	0.3	4.8	105	129	129	208	Steam	Yes	No	No
AOE 1	4	4	10.0	14.0	18.0	132	157	151	583	Steam	Yes	No	No
AOOR 1	7	7	5.7	9.7	13.7	117	149	116	442	Steam	Yes	No	No
MISO 477/													
MISO 509	21	21	22.5	26.5	30.5	78	88	85	56	Diesel	No	No	No
AD 15	3	3	34.7	38.7	42.7	45	53	76	827	Steam	No	No	No
AD 37	2	2	9.8	13.8	17.8	47	41	74	1286	Steam	No	No	No
AD 41	(h)	3	N/A	1.2	4.2	NA	36	45	1277	Steam	No	No	No
AR 5	2	2	34.7	38.7	42.7	34	73	72	847	Steam	No	No	No

(a),(c) Ref: *Jane's Fighting Ships (1987-1988 edition)*

(b) Computed from ship commissioning dates (in years) from *Jane's Fighting Ships* for each class. Margin of error +/- .25 years

(c) Ref: Center for Naval Analyses (Mr. John Vinco)

(d) Ref: OP-122/Manpower Programs and Support Branch (CDR Nicholn)

(f) Ref: *Jane's Fighting Ships*. Guns includes installed 3in/50, 5in/54, 5in/38, and/or MK 16 Close-In Weapons System (CIWS)

Missiles includes installed anti-air or cruise missile capability

(g) No underway time in FY82 due to extended overhaul period in shipyard facility.

(h) No ships in this class in active service during period of observation.

III. DATA ANALYSIS

This research represents an effort to study the relationship between ship type and first-term attrition by Navy enlistees. Since there is little previous research in the area, this study is exploratory--seeking to break new ground and to clear a path for further research. Nevertheless, the analysis has revealed several consistent trends across cohorts, suggesting possible directions for subsequent research on the causes of and cures for first-term enlisted attrition in the Navy.

A. COHORT ANALYSES

In analyzing the fiscal 1977, 1981, and 1985 cohorts, a total of 77,502 records were examined. These numbers reflect personnel who reported to their initial ship assignment with less than 34 months of active service (27,701 in 1977; 25,739 in 1981; and 24,062 in 1985). Personnel are then tracked to identify those who separate before reaching a total of 33 months of active service while aboard their initially-assigned ship.

As noted in Chapter II, only male attrition is evaluated. The cohort sample was drawn from a total of 227 ships in fiscal 1977, 263 ships in 1981, and 300 ships in 1985. The rise in number of ships between the first and last cohorts

represents the addition of 73 newly-commissioned ships, distributed as follows:

- 65 cruisers/destroyers/frigates.
- 1 amphibious ship.
- 5 oilers.
- 2 repair ships.

Data were tabulated in three formats: by individual ship (as identified by Unit Identification Code (UIC)), by ship class, and by mission category. The first digit of the category/ship class code represents the category of ship by broad mission requirement, as outlined in Chapter II. The first digit of the code signifies one of the following categories (CAT):

- 1--Cruisers (CG/CGN), Destroyers (DDG/DD), or Frigates (FFG/FF).
- 2--Amphibious ships (LPD/LKA/LSD/LST/LCC).
- 3--Oilers (AE/AFS/AO/AOE/AOR).
- 4--Minesweepers (MSO).
- 5--Repair ships (AD/AR).

The second character (a letter) of the code represents a specific ship class within each category. Ships within a common class are constructed to the same general specifications. As an example, the USS NIAGARA FALLS (AFS 3) has a CAT/CLASS code of 3D meaning this ship is an oiler in the Mars-class (see Appendix B).

Before exploring the attrition loss rates within and between each cohort, several demographic variables were examined by ship category. The demographic variables include average age, mean percentile score on the Armed Forces Qualification Test (AFQT), and racial/ethnic group.

1. Age

Table 2 shows the average age of all persons who separated from the Navy by ship category for each of the three cohorts.

The data reveal a consistent trend between cohorts. Within ship categories, cruisers, destroyers, and frigates (CAT 1) and repair ships (CAT 5) have the oldest personnel, on average, of those who separate early in each cohort. Minesweepers (CAT 4) tend to have the youngest personnel among those who separate early from the 1981 and 1985 cohorts.

TABLE 2

AVERAGE AGE OF ALL ENLISTEES AND FIRST-TERM LOSSES
BY SHIP CATEGORY: 1977, 1981, AND 1985 COHORTS*

1977 COHORT

SHIP CATEGORY	NO. OF SHIPS IN CATEGORY	Average Age	
		ALL ENLISTEES	FIRST-TERM LOSSES
1	120	19.8	19.2
2	48	19.7	19.1
3	32	19.7	19.0
4	18	20.1	19.2
5	<u>9</u>	<u>19.8</u>	<u>19.1</u>
TOTAL	227	19.8	19.2

*Age computed at time of loss.

1981 COHORT

SHIP CATEGORY	NO. OF SHIPS IN CATEGORY	Average Age	
		ALL ENLISTEES	FIRST-TERM LOSSES
1	152	20.1	19.5
2	48	19.9	19.4
3	35	19.9	19.4
4	18	20.1	19.2
5	<u>10</u>	<u>20.0</u>	<u>19.6</u>
TOTAL	263	20.0	19.5

TABLE 2 (Continued)

1985 COHORT

SHIP CATEGORY	NO. OF SHIPS IN CATEGORY	Average Age	
		ALL ENLISTEES	FIRST-TERM LOSSES
1	185	20.7	20.1
2	49	20.5	19.8
3	37	20.6	20.1
4	18	20.4	18.4
5	<u>11</u>	<u>20.7</u>	<u>20.1</u>
TOTAL	300	20.6	20.0

Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, CA.

2. AFQT

Table 3 shows the AFQT mean percentile scores of all enlistees assigned to ships within each cohort by ship category. As pointed out by Elster and Flyer, "enlistees with higher AFQT scores are less likely to attrite than those with lower scores." [Ref. 4:p. 30] The data in this analysis are consistent with this finding for the 1977 and 1985 cohorts. The reader should note that these data aggregate loss rates across educational levels.

TABLE 3

AVERAGE AFQT PERCENTILE SCORES OF ALL ENLISTEES AND
FIRST-TERM LOSSES BY SHIP CATEGORY: 1977, 1981, 1985 COHORTS

1977 COHORT

SHIP CATEGORY	NO. OF SHIPS IN CATEGORY	<u>Average AFQT Percentile Score</u>	
		ALL ENLISTEES	FIRST-TERM LOSSES
1	120	57.4	53.5
2	48	50.8	49.6
3	32	49.0	49.4
4	18	59.0	52.2
5	<u>9</u>	<u>51.7</u>	<u>48.3</u>
TOTAL	227	54.0	51.2

1981 COHORT

SHIP CATEGORY	NO. OF SHIPS IN CATEGORY	<u>Average AFQT Percentile Score</u>	
		ALL ENLISTEES	FIRST-TERM LOSSES
1	152	56.5	55.5
2	48	51.5	53.1
3	35	49.9	51.9
4	18	56.7	62.3
5	<u>10</u>	<u>50.5</u>	<u>53.3</u>
TOTAL	263	53.9	54.2

TABLE 3 (Continued)

1985 COHORT

SHIP CATEGORY	NO. OF SHIPS IN CATEGORY	<u>Average AFQT Percentile Score</u>	
		ALL ENLISTEES	FIRST-TERM LOSSES
1	185	59.4	55.9
2	49	52.5	51.3
3	37	52.9	53.9
4	18	47.1	43.7
5	<u>11</u>	<u>53.7</u>	<u>52.3</u>
TOTAL	300	56.7	54.2

Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, CA.

Across all ship categories and cohorts, personnel in cruisers, destroyers, and frigates (CAT 1) have the highest AFQT mean percentile score, while personnel in oilers have the lowest overall score across the three cohorts. Also worthy of note is that the AFQT mean percentile score of the 1981 cohort losses in minesweepers (CAT 4) was noticeably higher than the cohort average for minesweepers or in the other ship mission categories. The reason for this is unknown; however, the number of minesweeper losses is relatively small (37) compared to that of other ship mission categories. A step toward understanding this observation would be to organize the data by educational level and mental group.

3. Racial/Ethnic Group

Table 4 shows the racial/ethnic distribution of first-term losses by ship category. Appendix A presents the racial/ethnic make-up of each cohort by ship mission category, as well as the first-term losses depicted in Table 4.

TABLE 4

PERCENT OF PERSONNEL FAILING TO COMPLETE FIRST-TERM
OF ENLISTMENT BY SHIP CATEGORY AND RACIAL/ETHNIC GROUP:
1977, 1981, AND 1985 COHORTS

SHIP CATEGORY	NO. OF SHIPS IN CATEGORY	1977 COHORT			
		FIRST-TERM LOSSES (% OF ALL ENLIST.)			
		WHITE	BLACK	HISPANIC	OTHER
1	120	17.0	11.3	17.4	11.2
2	48	23.4	20.1	21.4	14.7
3	32	23.7	17.1	18.3	13.6
4	18	17.4	50.0	38.4	33.3
5	<u>9</u>	<u>19.3</u>	<u>17.1</u>	<u>22.1</u>	<u>10.7</u>
TOTAL	227	19.5	15.1	19.1	12.6

TABLE 4 (Continued)

1981 COHORT

SHIP CATEGORY	NO. OF SHIPS IN CATEGORY	FIRST-TERM LOSSES (% OF ALL ENLIST.)			
		WHITE	BLACK	HISPANIC	OTHER
1	152	18.3	16.0	17.2	13.4
2	48	23.3	17.8	15.3	19.3
3	35	23.8	18.4	13.8	17.2
4	18	18.4	9.1	14.3	0
5	<u>10</u>	<u>17.8</u>	<u>16.2</u>	<u>16.2</u>	<u>7.5</u>
TOTAL	263	20.0	16.8	16.0	12.6

1985 COHORT

SHIP CATEGORY	NO. OF SHIPS IN CATEGORY	FIRST-TERM LOSSES (% OF ALL ENLIST.)			
		WHITE	BLACK	HISPANIC	OTHER
1	185	12.7	12.6	12.4	8.4
2	49	17.7	15.3	12.2	10.4
3	37	19.5	14.1	15.3	6.2
4	18	15.1	17.9	0	33.3
5	<u>11</u>	<u>12.4</u>	<u>13.9</u>	<u>11.6</u>	<u>5.8</u>
TOTAL	300	14.6	13.6	12.7	8.4

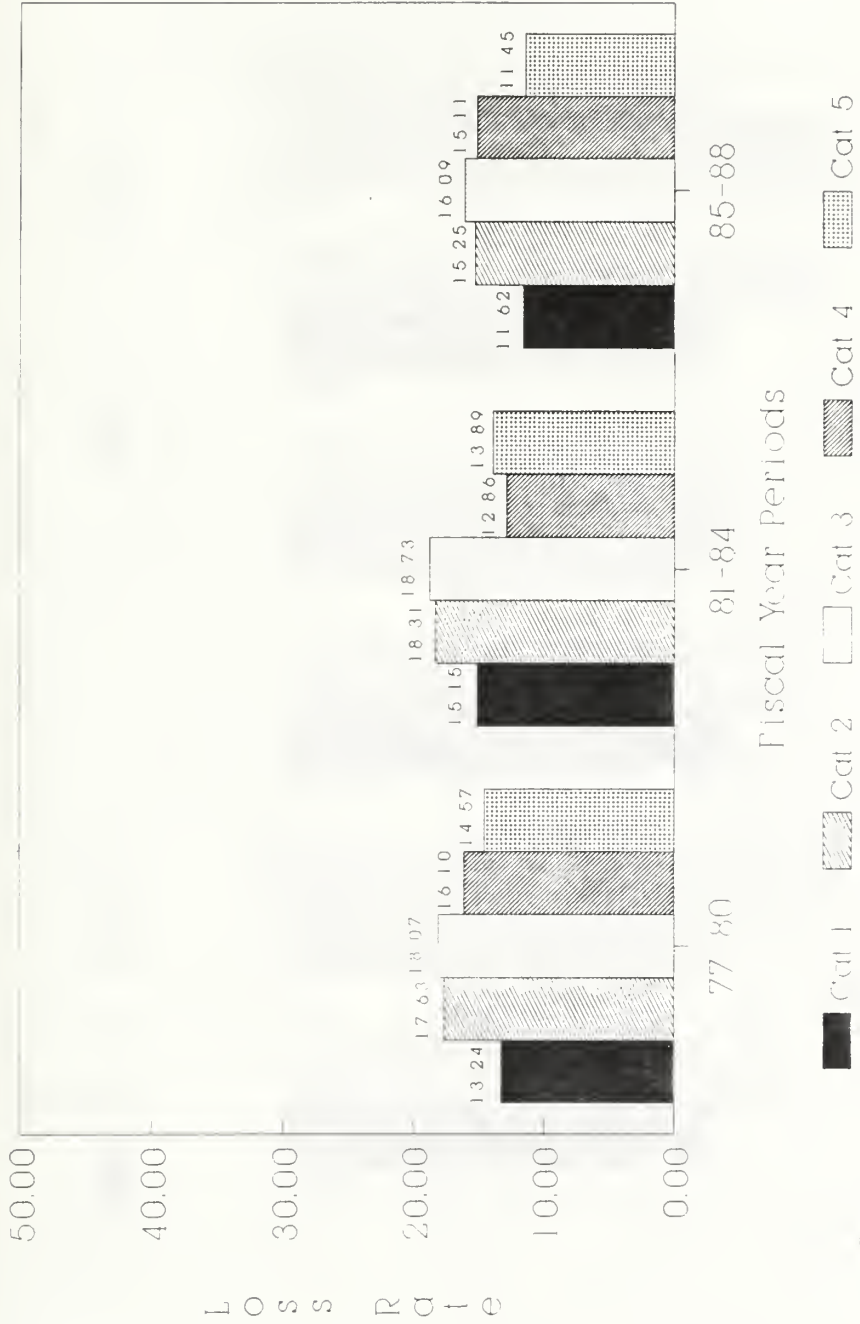
Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, CA.

In all cohorts, whites generally experienced the highest attrition levels, followed by Hispanics, blacks, and "others" (primarily persons of Asian or Filipino descent). There were exceptions within each cohort. In the 1977 cohort,

first-term losses of blacks and Hispanics on minesweepers (CAT 4) was relatively high (50.0 percent and 38.4 percent, respectively) compared to whites. This is due to very small sample sizes where one of two blacks and two of five Hispanics separated early. In the 1981 cohort, black and Hispanic losses were relatively low on minesweepers (CAT 4). Again, this is attributed to small sample sizes (see Appendix A). In the 1985 cohort, loss rates for blacks are actually higher than white loss rates on minesweepers and repair ships. It is interesting to note this departure from past observations as it represents a reversal from previous data observations. The reason for this change is unknown.

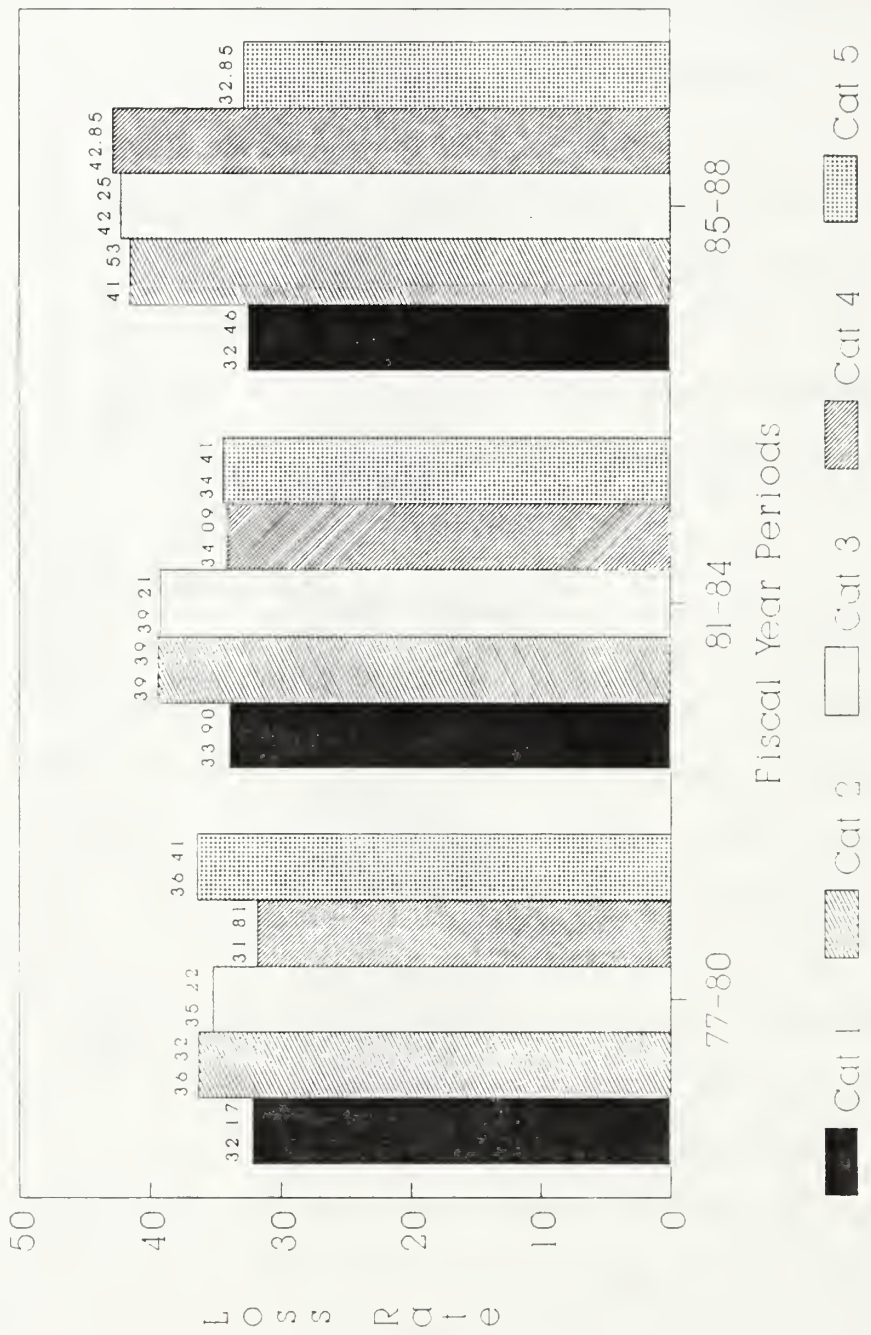
4. Educational Level

Figure 2 illustrates the loss rates of High School Diploma Graduates (HSDGs) by mission category. Figure 3 does the same for Non-High School Diploma Graduates (NHSDGs) or those with General Educational Development (GED) equivalency certificates. Loss rates are calculated as the number of HSDG (or NHSDG/GED) personnel who separate early from the Navy divided by all enlistees assigned to ships who are HSDGs (or NHSDG/GEDs). In Figures 2 and 3, and Table 5, loss rates are expressed as percentages. In examining educational levels, the loss rates of personnel who were high school graduates were consistently lower than the rates of those in the NHSDG/GED category. As shown in Figure 2, cruisers, destroyers, and frigates (CAT 1) have the lowest attrition



Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, CA.

Figure 2. Loss Rates (%) of First-Term High School Diploma Graduate (HSDG) Enlistees by Ship Category: 1977, 1981, and 1985 Cohorts



Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, CA.

Figure 3. Loss Rates (%) of First-Term Non-High School Diploma Graduate (HSDG) Enlistees by Ship Category: 1977, 1981, and 1985 Cohorts

TABLE 5

EDUCATIONAL LEVEL OF ALL ENLISTEES AND FIRST-TERM
LOSSES WITH LOSS RATES BY SHIP CATEGORY:
1977, 1981, AND 1985 COHORTS

1977 COHORT

SHIP CAT.	HSDG			NGSDG/GED		
	ALL ENL.	FIRST- TERM LOSSES	LOSS RATE	ALL ENL.	FIRST- TERM LOSSES	LOSS RATE
1	11,446	1,516	13.2	2,530	814	32.2
2	4,644	819	17.6	1,346	489	36.3
3	3,740	676	18.1	1,198	422	35.2
4	149	24	16.1	44	14	31.8
5	<u>2,052</u>	<u>299</u>	<u>14.6</u>	<u>552</u>	<u>201</u>	<u>36.4</u>
TOTAL	22,031	3,334	15.1	5,670	1,940	34.2

1981 COHORT

SHIP CAT.	HSDG			NGSDG/GED		
	ALL ENL.	FIRST- TERM LOSSES	LOSS RATE	ALL ENL.	FIRST- TERM LOSSES	LOSS RATE
1	11,805	1,789	15.2	1,979	671	33.9
2	3,974	728	18.1	853	336	39.4
3	3,453	647	18.7	709	278	39.2
4	171	22	12.9	44	15	34.1
5	<u>2,317</u>	<u>322</u>	<u>13.9</u>	<u>433</u>	<u>149</u>	<u>34.4</u>
TOTAL	21,721	3,508	16.2	4,018	1,449	36.1

TABLE 5 (Continued)

1985 COHORT

SHIP CAT.	HSDG			NGSDG/GED		
	ALL ENL.	FIRST- TERM LOSSES	LOSS RATE	ALL ENL.	FIRST- TERM LOSSES	LOSS RATE
1	13,423	1,560	11.6	653	212	32.5
2	4,090	624	15.3	248	103	41.5
3	3,536	569	16.1	239	101	42.3
4	172	26	15.1	7	3	42.9
5	<u>1,624</u>	<u>1,624</u>	<u>11.5</u>	<u>70</u>	<u>23</u>	<u>32.9</u>
TOTAL	22,845	2,965	13.0	1,217	442	36.3

Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, CA.

rates of HSDG personnel, followed by repair ships (CAT 5) and minesweepers (CAT 4). Conversely, oilers (CAT 3) have the highest HSDG losses, followed closely by amphibious ships (CAT 2). In Figure 3, cruisers, destroyers, and frigates (CAT 1) have the lowest loss rates for NHSDG/GED personnel, followed by minesweepers (CAT 4) (except in the 1985 cohort). It should be noted that the sample size among minesweepers was very small (three of seven NHSDG/GED personnel in the sample who separated early) relative to the numbers of personnel in other ship categories. Table 5 further compares the first-term loss rates of enlistees who had a traditional high school diploma with those who did not, by ship category for each cohort.

Cruisers, destroyers, and frigates (CAT 1) have the largest numbers of HSDG and NHSDG/GED personnel within each cohort, whereas minesweepers (CAT 4) have the smallest. This is explained by a larger number of ships in Category 1 relative to all other ship categories. Minesweeper crew sizes are also much smaller (about 56 personnel on average), compared with all other ships considered in this study (see Table 1). The next smallest crew size (241 personnel) can be found aboard LSTs (CAT 2), while the largest crews (1,286 personnel) serve on repair ships (ADs-CAT 5).

As discussed in Chapter I, Cooke and Quester found that NHSDG/GEDs have attrition rates that are twice as large as those of HSDGs. The loss rates in the 1977 and 1981 cohorts are consistent with this finding, however, in the 1985 cohort, the NHSDG/GED loss rate (36.3 percent) is almost three-times greater than the HSDG rate (13.0 percent). Even with specific ship mission categories in the 1985 cohort, this approximate three-to-one (NHSDG/GED-to-HSDG) loss ratio is consistent. As one hypothesis, it is possible that due to slightly higher quality enlistees in the 1985 cohort, higher standards in the fleet and elsewhere may have partially influenced an increase in the number of NHSDG/GED losses.

Across cohorts, there was no ship mission category that consistently had the largest NHSDG/GED or HSDG loss rates. However, cruisers, destroyers, and frigates (CAT 1) did have the lowest overall HSDG and NHSDG/GED loss rates

(1977, 1981, and 1985 cohorts combined). This is further investigated in the attrition loss rate analysis later in this chapter.

B. ATTRITION RATE RESULTS

With an understanding of cohort composition by sex, age, AFQT scores, racial/ethnic group, and educational level, data were extracted from the Enlisted Master Record (EMR) by individual ship (as identified by UIC), ship class, and mission category to determine possible trends in attrition between the 1977, 1981, and 1985 cohorts.

1. Individual Ship Analysis

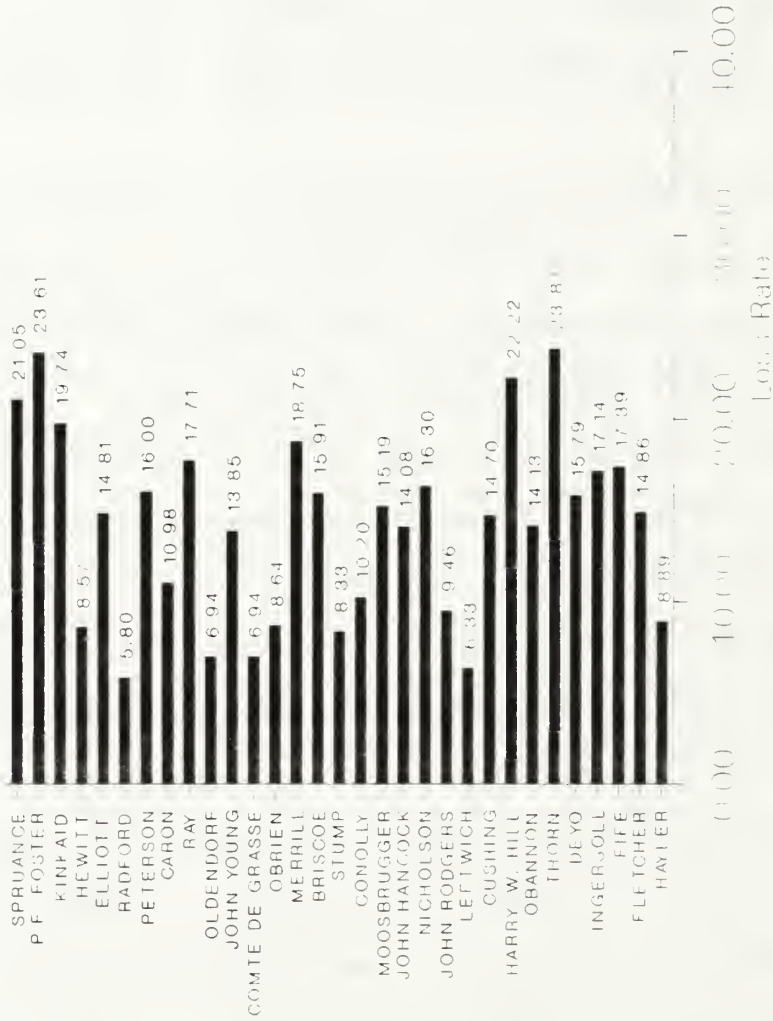
Appendix B shows the number of attrition losses, by UIC, among personnel who reported to their ship in each cohort year with less than 34 months of active service. Personnel were tracked aboard their ship until they reached the 33-month time-in-service window. By running a frequency history on each cohort, it was determined that the average sailor reported aboard his initial ship with between four and ten months time-in-service. Specifically, the greatest number of sailors had between five and seven months active service by the time they reported aboard ship. The frequency history also revealed that there were relatively more persons with less than 12 months of service (69.1 percent) in the 1977 cohort than in the 1985 cohort (64.8 percent). This suggests

that sailors in the 1985 cohort received more training enroute to their first ship than did those in the 1977 cohort.

Further analyzing loss data in Appendix B, it was observed that attrition rates are largest during the first year aboard a ship (i.e., the year following cohort entry). This trend is consistent in the 1977, 1981, and 1985 cohorts. Attrition then tapers off in succeeding years, as sailors become more experienced and accrue more time aboard their ship.

Figure 4 provides an example of differences in loss rates that may occur among individual ships of the same class. In Figure 4, the personnel loss rates from the 1985 cohort for 31 Spruance-class destroyers (1L) are shown. While the Spruance-class average loss rate is 14.1 percent, a high of 23.8 percent (THORN) and a low of 5.8 percent (RADFORD) can be observed. The explanation for this wide variation between individual ships is not clear. The ships within this class are of similar age. They possess the same mission capability. Where they may be different is in operating schedules (although over a 33-month period, the operating days at sea are not expected to be greatly different), command climate, commanding officer leadership, crew/ship performance record, and other possible variables discussed in Chapter I. In observing one ship over two different cohorts, there may also be wide variation. For example, one ship in the Spruance class (1L) had a loss rate of 6.9 percent (THORN) for the 1985

Ship Name



Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, CA.

Figure 4. Loss Rates (%) of First-Term Enlistees Among Individual Ships of the Spruance-Class (1L): 1985 Cohort

cohort. That same ship had a loss rate of 19.1 percent for the 1981 cohort (see Appendix B). This difference in loss rate may reflect both differences between the 1981 and 1985 cohorts, and the differences between DD988 (circa 1981) vs. DD988 (circa 1985) with regard to ship schedule, commanding officer, and so on.

2. Ship Class Analysis

The following is a list of ship classes that correlate to the CAT/CLASS code appearing in Table 5 and Appendix C:

- 1A--Virginia class CGN.
- 1B--California class CGN.
- 1C--Truxton class CGN.
- 1D--Bainbridge class CGN.
- 1E--Long Beach class CGN.
- 1F--Ticonderoga class CG.
- 1G--Belknap class CG.
- 1H--Leahy class CG.
- 1I--Kidd class DDG.
- 1J--Farragut class DDG.
- 1K--Adams class DDG.
- 1L--Spruance class DD.
- 1M--Brooke class FFG.
- 1N--Knox class FF.
- 1P--Garcia class FF.
- 1Q--Oliver Hazard Perry class FFG.
- 2A--Raleigh class LPD.

- 2B--Charleston class LKA.
- 2C--Spiegel Grove class LKA.
- 2D--Anchorage class LSD.
- 2E--Whidbey Island class LSD.
- 2F--Newport class LST.
- 2G--Blue Ridge class LCC.
- 3A--Suribachi class AE.
- 3B--Nitro class AE.
- 3C--Butte class AE.
- 3D--Mars class AFS.
- 3E--Caloosahatchee class AO.
- 3F--Cimarron class AO.
- 3G--Sacramento class AOE.
- 3H--Witchita class AOE.
- 4A--Constant class MSO.
- 5A--Prairie class AD.
- 5B--Samuel Gompers class AD.
- 5C--Yellowstone class AD.
- 5D--Vulcan class AR.

Table 6 provides a summary of loss data in the ship-class format.

TABLE 6

NUMBER AND PERCENT OF COHORT LOSSES (ATTRITION)
 BY SHIP CLASS: 1977, 1981, AND 1985 COHORTS

1977 COHORT

CAT/ CLASS	NO. SHIPS	<u>Number of Personnel</u>	<u>Personnel Losses</u>	
		CREW WITH LESS THAN 34 MONTHS SERVICE	NUMBER	RATE*
1A	3	382	49	12.8
1B	2	362	66	18.2
1C	1	148	23	15.5
1D	1	202	26	12.9
1E	1	343	44	12.8
1G	8	1,210	191	15.8
1H	9	1,237	191	15.4
1J	0	1,477	241	16.3
1K	3	2,767	510	18.4
1L	8	865	129	14.9
1M	6	584	115	19.7
1N	9	3,542	579	16.3
1P	9	857	166	19.4
2A	13	2,188	476	21.8
2B	5	534	116	21.7
2C	3	337	60	17.8
2D	5	625	153	24.5
2F	0	1,790	421	23.5
2G	2	516	82	15.9
3A	2	240	54	22.5
3B	3	364	104	28.6
3C	7	903	233	25.8
3D	7	1,024	205	20.0
3E	2	271	62	22.9
3G	4	868	180	20.7
3H	7	1,268	260	20.5
4A	8	193	38	19.7
5A	3	903	163	18.1
5B	2	707	144	20.4
5C	1	208	22	10.6
5D	3	786	171	21.8
TOTAL	227	27,701	5,274	19.0

*Rate of personnel losses is the percentage of those with less than 34 months of service who leave the Navy before completing a first-term enlistment

TABLE 6 (Continued)

1981 COHORT

CAT/ CLASS	NO. SHIPS	<u>Number of Personnel</u>		<u>Personnel Losses</u>	
		CREW WITH LESS THAN 34 MONTHS SERVICE	NUMBER	RATE*	
1A	4	492			
1B	2	280	66	13.4	
1C	1	153	37	13.2	
1D	1	153	18	11.8	
1E	1	194	27	17.6	
1G	9	1,117	43	22.2	
1H	9	1,101	200	17.9	
1I	4	446	208	18.9	
1J	10	1,094	39	8.7	
1K	23	2,291	218	19.9	
1L	30	2,304	416	18.2	
1M	6	454	411	17.8	
1N	39	2,959	103	22.7	
1P	9	606	531	17.9	
1Q	4	140	122	20.1	
2A	13	1,721	21	15.0	
2B	5	318	404	23.5	
2C	3	327	74	23.3	
2D	5	507	72	22.0	
2F	20	1,501	108	21.3	
2G	2	454	314	20.9	
3A	2	169	92	20.3	
3B	3	270	43	25.4	
3C	7	740	70	25.9	
3D	7	949	172	23.2	
3E	2	238	178	18.8	
3F	3	230	60	25.2	
3G	4	691	36	15.7	
3H	7	875	174	25.2	
4A	18	215	192	21.9	
5A	3	785	37	17.2	
5B	2	684	177	22.5	
5C	2	637	112	16.4	
5D	3	644	75	11.8	
TOTAL	263	25,739	107	16.6	
			4,957	19.3	

TABLE 6 (Continued)

1985 COHORT

CAT/ CLASS	NO. SHIPS	<u>Number of Personnel</u>	<u>Personnel Losses</u>	
		CREW WITH LESS THAN 34 MONTHS SERVICE	NUMBER	RATE*
1A	4	515	42	8.2
1B	2	267	28	10.5
1C	1	156	21	13.5
1D	1	158	15	9.5
1E	1	231	29	12.6
1F	3	273	15	5.5
1G	9	945	136	14.4
1H	9	833	90	10.8
1I	4	343	36	10.5
1J	10	926	129	13.9
1K	32	1,842	229	12.4
1L	31	2,419	342	14.1
1M	6	364	48	13.2
1N	39	2,484	305	12.3
1P	9	551	89	16.2
1Q	33	1,769	218	12.3
2A	13	1,356	234	17.3
2B	5	467	72	15.4
2C	3	265	49	18.5
2D	5	437	74	16.9
2E	1	207	22	10.6
2F	20	1,213	238	19.6
2G	2	393	38	9.7
3A	2	203	53	26.1
3B	3	270	47	17.4
3C	7	653	138	21.1
3D	7	812	110	13.5
3E	2	175	33	18.9
3F	5	214	31	14.5
3G	4	639	97	15.2
3H	7	809	161	19.9
4A	18	179	29	16.2
5A	3	371	43	11.6
5B	2	478	57	11.9
5C	3	495	62	12.5
5D	3	350	47	13.4
TOTAL	300	24,062	3,407	14.2

Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, CA.

Across all three cohorts, the Suribachi (3A), Nitro (3B), and Butte (3C) class oilers have the highest attrition rates, while nuclear-powered guided missile cruisers (CGNs) have the lowest rates. There is wide variation in loss rates by cohort year among the 36 ship classes examined. As the age of a ship class increases, attrition rates among later cohorts (1981 and 1985) do not necessarily increase. In fact, in some classes, the rate of attrition actually declines for later cohorts. No clear relationship can be shown regarding operating days at sea. Some ship classes with relatively heavy operating schedules (see Table 1) have low loss rates compared with the cohort average. At the same time, other ship classes with few operating days at sea also have relatively low loss rates compared to the cohort average. The attrition loss rates are similar for repair ships, which have light operating schedules, and some cruiser, destroyer, and frigate classes, which have many more average operating days at sea.

Among the majority of ships across ship classes, there remains no distinct relationship of attrition with operating days at sea. Within and across ship classes, loss rates may be low with a high yearly number of days at sea, and in other cases, loss rates may be high with a high number of days at sea (see Appendix B).

Ship size revealed no clear relationship across ship classes. Repair ships (CAT 5) have the largest average crew

sizes (see Figure 1), yet their loss rates were comparable to or lower than some ship classes in all cohorts. The loss rates for repair some destroyers and frigates, which tend to have comparatively small crew sizes, were higher than repair ships with larger crews.

3. Ship Mission Category Analysis

Ship classes were grouped in the five broad mission categories described earlier in this chapter. This format was chosen to determine general trends among ship classes that may share similar mission requirements as outlined in Chapter II. Table 7 presents the attrition loss rates for each cohort by these five categories.

Across all three cohorts, it can be seen that ships in the cruiser, destroyer, and frigate classes (CAT 1) have the lowest loss rates. Repair ships (CAT 5), which have the largest crew sizes and the fewest operating days at sea, have the second lowest attrition rates compared with all other ship classes examined here. The third lowest rates are found on minesweepers (CAT 4), followed by amphibious ships (CAT 2). Oilers (CAT 3) tend to have the highest personnel loss rates of the five categories. The trends are quite clear. (There may be numerous explanations for these results, some of which are explored in the concluding chapter.) The loss rates are graphically displayed in Figure 5, which provides another view of the differences between ship classes.

TABLE 7

NUMBER AND PERCENT OF FIRST-TERM LOSSES (ATTRITION)
BY MISSION CATEGORY: 1977, 1981, AND 1985 COHORTS

1977 COHORT

First-Term Enlisted Personnel

MISSION CATEGORY	NO. OF SHIPS IN CATEGORY	ALL ENLISTEES	FIRST-TERM LOSSES	LOSS RATE*
1	120	13,976	2,330	16.7
2	48	5,990	1,308	21.8
3	32	4,938	1,098	22.2
4	18	193	38	19.7
5	<u>9</u>	<u>2,260</u>	<u>500</u>	<u>19.2</u>
TOTAL	227	27,701	5,274	19.0

1981 COHORT

First-Term Enlisted Personnel

MISSION CATEGORY	NO. OF SHIPS IN CATEGORY	ALL ENLISTEES	FIRST-TERM LOSSES	LOSS RATE*
1	152	13,784	2,460	17.8
2	48	4,828	1,064	22.0
3	35	4,162	925	22.2
4	18	215	37	17.2
5	<u>10</u>	<u>2,750</u>	<u>471</u>	<u>17.1</u>
TOTAL	263	25,739	4,957	19.3

TABLE 7 (Continued)

1985 COHORT

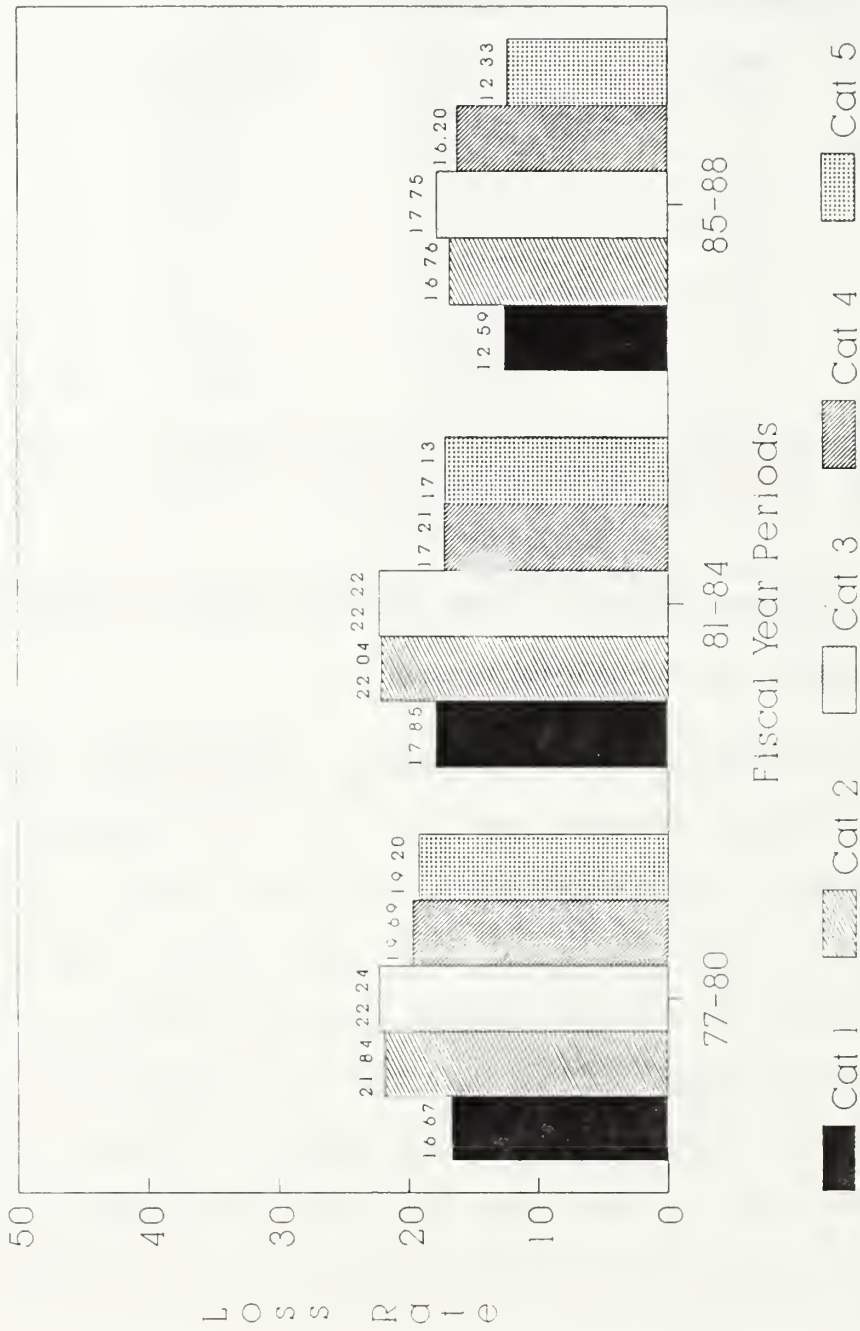
First-Term Enlisted Personnel

MISSION CATEGORY	NO. OF SHIPS IN CATEGORY	ALL ENLISTEES	FIRST-TERM LOSSES	LOSS RATE*
1	185	14,076	1,772	12.6
2	49	4,338	727	16.8
3	37	3,775	670	17.7
4	18	179	29	16.2
5	<u>11</u>	<u>1,694</u>	<u>209</u>	<u>12.3</u>
TOTAL	300	24,062	3,407	14.2

*Rate of personnel losses is the percentage of those with less than 34 months of service who leave the Navy before completing a first term of enlistment.

Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, CA.

The total average personnel loss rate remained relatively constant between the 1977 and 1981 cohorts (19.0 and 19.3 percent, respectively); but it fell to 14.2 percent for the 1985 cohort. It should be noted that a substantial number of persons in the designated cohorts actually enlisted during the prior year. Thus, a large portion of persons in the 1985 cohort (those assigned to ships in 1985) enlisted during fiscal 1984. In 1983 and 1984, the Navy experienced an increase in the quality of its new recruits. This increase in



Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, CA.

Figure 5. Loss Rates (%) of First-Term Enlisted Personnel by Ship Category: 1977, 1981, and 1985 Cohorts

quality resulted in a modest reduction in attrition of first-term enlistees during the mid-1980s. [Ref. 7] The lower attrition rate for the 1985 cohort is also affected by a rise in the relative number of persons leaving the Navy during the first few months of service (i.e., before many report to their first ship because they are in the school pipeline). For example, in 1981 male attrition during the first 12 months was 12.1 percent, compared to a rate of 15.1 percent for those in the 1985 cohort. This rise in early attrition, combined with the fact that personnel are apparently reporting aboard ship with more training (i.e., this is inferred from greater time-in-service) in 1985 than 1977 or 1981, may also help to explain why attrition rates were unexpectedly lower for the 1985 cohort of enlistees assigned to ships. Although the 1985 cohort represents an increased number of high quality accessions compared with the 1977 and 1981 cohorts, the drop in attrition represented in this cohort has not been sustained by those who enlisted beyond late 1985. Consequently, this may partially explain why overall attrition rates have continued to rise since that time [Ref. 7].

4. Losses by Rating

From the loss statistics, the ratings (or occupations) of personnel were extracted to examine possible relationships among ship types. Appendix D details cohort losses by rating within ship categories. Table 8 shows the loss rates for Navy ratings that had the highest attrition rates within each ship

TABLE 8

THE TEN NAVY RATINGS WITH THE HIGHEST RATES OF ATTRITION
WITHIN SHIP CATEGORY: 1977, 1981, AND 1985 COHORTS (a)

SHIP CAT.	RANK	<u>1977 Cohort</u>		<u>1981 Cohort</u>		<u>1985 Cohort</u>	
		RATING	LOSS RATE	RATING	LOSS RATE	RATING	LOSS RATE
1	1	FR	34.4	BM	71.9	SR	28.9
	2	SR	28.5	SR	31.6	FR	27.0
	3	FN	25.9	FR	28.2	SM	25.2
	4	BM	23.1	SH	24.3	BM	18.4
	5	FA	22.9	SA	23.7	FN	17.7
	6	SA	22.0	FN	22.5	SH	16.7
	7	YN	20.9	SN	20.6	SA	16.1
	8	SH	19.0	SK	19.6	FC	15.0
	9	SN	18.7	FA	19.6	FA	14.3
	10	BT	17.7	SM	18.1	BT	12.5
2	1	FR	36.3	FN	42.5	SR	31.9
	2	SR	28.7	SR	36.6	SM	29.4
	3	SA	26.9	FR	31.7	FR	24.5
	4	FA	24.5	AR	28.9	SK	23.3
	5	MS	24.4	MS	28.3	MS	21.7
	6	AA	23.4	BT	26.6	QM	20.3
	7	SN	22.1	SA	20.9	HT	19.1
	8	SH	19.6	SN	19.9	FA	18.6
	9	SM	17.4	HT	18.6	YN	18.4
	10	FN	17.4	FA	17.1	SA	18.1

TABLE 8 (Continued)

SHIP CAT.	RANK	<u>1977 Cohort</u>		<u>1981 Cohort</u>		<u>1985 Cohort</u>	
		RATING	LOSS RATE	RATING	LOSS RATE	RATING	LOSS RATE
3	1	FR	34.3	SR	33.8	FR	28.9
	2	FN	31.8	FR	30.2	SR	27.3
	3	FA	28.7	GMG	25.6	FN	26.8
	4	SA	27.9	EN	24.0	SH	21.7
	5	SR	24.6	SA	22.1	SK	18.1
	6	MS	23.9	FN	21.2	MS	19.4
	7	SN	21.7	BT	20.2	SK	18.1
	8	BT	17.2	SM	19.1	SA	17.7
	9	MM	16.5	OS	18.4	SN	15.9
	10	RM	16.2	SN	18.0	HT	14.4
4	1	FR	50.0	SN	45.5	SR	30.8
	(C) 2	HT	44.4	MS	36.4	FA	25.0
	3	SR	40.9	BM	33.3	SA	17.9
	4	FN	33.3	FR	28.6	EM	14.3
	5	FA	28.6	SA	21.7	FN	12.5

TABLE 8 (Continued)

SHIP CAT.	RANK	<u>1977 Cohort</u>		<u>1981 Cohort</u>		<u>1985 Cohort</u>	
		RATING	LOSS RATE	RATING	LOSS RATE	RATING	LOSS RATE
5	1	FA	32.3	SR	34.9	MS	27.3
	2	FR	30.3	FR	27.2	SR	23.6
	3	YN	27.8	SN	23.1	FR	21.7
	4	SA	27.0	YN	20.0	YN	14.3
	5	SR	26.7	SK	17.9	MM	12.3
	6	FN	24.6	BT	17.9	SA	12.4
	7	SN	23.3	FN	16.7	SN	10.8
	8	EN	17.9	EN	13.6	FA	10.3
	9	BT	15.9	MM	13.4	FN	10.0
	10	STG	13.3	HT	12.3	SK	10.0

(a) This is a relative scale and does not take into account the actual size of the cohort within the ratings listed.

(b) Loss rates are relative within each ship mission category among all ratings that experienced losses.

(c) Due to the relatively small crews on minesweepers (an average of 56 per ship), relative to other ship classes, there is a much narrower range of ratings that serve on this class of ship. Therefore, only the five highest ratings that experienced the highest loss rates were listed.

Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, Ca.

mission category. The abbreviations for the Navy ratings listed in Table 8 are explained below:

- AR--Airman Recruit.
- BM--Boatswain's Mate.
- BT--Boiler Technician.
- EM--Electrician's Mate.
- EN--Engineman.
- FA--Fireman Apprentice.
- FC--Fire Controlman.
- FN--Fireman.
- FR--Fireman recruit.
- GMG--Gunner's Mate (Guns).
- HT--Hull Technician.
- OS--Operations Specialist.
- QM--Quartermaster.
- RM--Radioman.
- SA--Seaman Apprentice.
- SH--Ship's Serviceman.
- SK--Storekeeper.
- SM--Signalman.
- SN--Seaman.
- SR--Seaman Recruit.
- STG--Sonar Technician.
- YN--Yeoman.

As seen in Table 8, within the same mission category, there are distinct trends across cohorts. Within cruisers, destroyers, and frigates (CAT 1), for example, the highest losses are consistently among SR, SA, SN, BM, FR, FA, and FN

personnel. In amphibious ships (CAT 2) and oilers (CAT 3), the MS rating also experiences high losses. Within minesweepers (CAT 4), the greatest losses are in line with CAT 1, 2, and 3 ships. Unlike the other mission category ships, YNs also experience high loss rates in repair ships (CAT 5). These findings are consistent with previous studies showing that persons in General Detail (GENDET) ratings (SR, SA, SN, FR, FA, FN, AR, AA, AN) generally have higher attrition than do personnel who have completed additional formal skill training after boot camp. [Ref. 9:p. 77] As Quester and Cooke state:

Although there are competing hypotheses, the usual interpretation of higher attrition rates for GENDETs is that the GENDET work environment is inherently less satisfying than the environments of those receiving skill training. [Ref. 13:p. 11]

High rates of attrition in other ratings (as shown in Table 8) may be partially explained by the workload or work environment (especially in the engineering ratings, such as EN,BT,HT,MM, and EM) unique to a particular ship or ship class. It is difficult to interpret loss rates in specific Navy ratings since many other factors such as command climate, organizational culture, and supervisory leadership may also affect these rates. However technical ratings tend to have fairly selective aptitude and education standards, screening out new recruits who are more likely to experience attrition or fail training. GENDETs, on the other hand, are among the least selective occupations in the Navy, attracting new

recruits who have generally lower aptitude test scores and levels of education. Previous research has shown that education (completion of high school) and aptitude are strongly linked with attrition, providing further explanation for the higher loss rates among those in non-technical or GENDET ratings.

5. Reason for Loss

The reason for each loss was tabulated to note similarities or differences between ship types. Table 9 categorizes these data for each cohort by mission category. Percent losses are grouped under five general discharge categories:

- Medical (includes disability or unqualified for active duty).
- Hardship or dependency.
- Death (battle or non-battle casualty).
- Performance (failure to meet performance criteria, such as drugs, court martial, desertion, homosexuality, behavioral disorders, misconduct, unsuitability, or civil conviction).
- Other (such as breach of contract, pregnancy, sole surviving son, or erroneous enlistment).

Table 9 shows that performance deficiencies account for between eight or nine out of every ten personnel losses within each cohort, followed by medical, and then "other." (Performance-related discharges increased in all categories except CAT 1 for the 1981 cohort.) In 1983 Navy and Marine Corps policy changes resulted in modifications to coding

TABLE 9

ATTRITION RATES, BY REASON, WITHIN SHIP MISSION CATEGORY:
1977, 1981, AND 1985 COHORTS

SHIP CATEGORY	Reason	Attrition Rate (Percent)		
		1977	1981	1985
1	Medical	8.3	3.7	4.5
	Hardship or dependency	1.5	0.7	1.8
	Death	2.2	1.5	1.1
	Performance	82.6	90.8	92.0
	Other	5.4	3.3	.6
2	Medical	6.3	1.8	5.8
	Hardship or dependency	1.0	0.8	1.0
	Death	1.8	1.6	1.1
	Performance	88.9	92.0	91.1
	Other	2.6	3.9	1.0
3	Medical	6.4	1.5	4.5
	Hardship or dependency	1.2	0.6	1.2
	Death	1.3	1.0	1.0
	Performance	85.7	93.6	92.5
	Other	5.4	3.1	.8

TABLE 9 (Continued)

SHIP CATEGORY	Reason	Attrition Rate (Percent)		
		1977	1981	1985
4	Medical	5.3	0	6.9
	Hardship or dependency	0	0	3.4
	Death	2.6	0	0
	Performance	86.8	91.9	89.7
	Other	5.3	8.1	0
5	Medical	6.8	2.9	5.3
	Hardship or dependency	1.0	0	.5
	Death	1.2	1.3	.5
	Performance	86.2	94.1	92.8
	Other	4.8	1.7	.9

Source: Derived from special tabulations provided by the Defense Manpower Data Center (DMDC), Monterey, CA.

losses. This policy change may explain the apparent difference in performance-related discharges between the 1981 and 1985 cohorts for CAT 2, 3, 4, and 5 ships. CAT 1 ships, however, still experienced a slight increase in performance-related discharges between the 1981 and 1985 cohorts. Likewise, there was also a policy change in loss coding between the 1977 and 1981 cohorts that resulted in a decrease in medical discharges in all ship mission categories.

(Appendix E provides a specific breakdown of Navy personnel who separate early in each cohort by mission category.)

In Chapter IV, conclusions are made based upon a summary of the data analysis. Additionally, recommendations for future research are offered, stemming from new questions raised in this study as a result of the research findings.

IV. SUMMARY AND RECOMMENDATIONS

A. SUMMARY

This thesis has attempted to determine if there is a relationship between first-term enlisted attrition and ship type, using the Defense Manpower Data Center (DMDC) Enlisted Master Record (EMR). The results of longitudinal analysis suggest that a relationship exists.

Each of three cohorts (including over 77,000 enlisted personnel) was examined with respect to average age, mean percentile score on the Armed Forces Qualification Test (AFQT), racial/ethnic background, and educational level. This was done to better understand the demographic composition of the cohorts and to provide possible explanations for the early separation of enlistees within each cohort. The distributions of personnel losses by demographic variables are generally consistent with the findings of previous studies. For example, results by aptitude followed the findings of previous studies, where it has been observed that those who separate early generally have lower AFQT scores than do their counterparts who complete a first term of enlistment. A comparison of loss rates by racial/ethnic group revealed higher attrition among whites than among other groups. The loss rates for Hispanics were higher than those for blacks; and the rates for blacks were higher than those for "other"

groups. This finding is also supported by previous research. Studies conducted over the past 30 years have repeatedly shown that possession of a high school diploma is strongly linked with adaptability to military life and successful completion of a first term of enlistment. Those who separated early and did not possess a high school diploma outnumbered (in terms of percent lost) high school graduates by greater than two-to-one in the 1977 and 1981 cohorts; and this ratio was three-to-one in the 1985 cohort, with no clear explanation for the increase.

By arranging the cohort data in three formats--individual ship, ship class, and broad mission category--trends and common relationships could be observed. As revealed in Chapter III, individual ships showed wide variation in cohort loss rates, which may suggest the influence of other factors such as command climate, commanding officer/executive officer leadership, crew/ship performance, operating schedule, and so on. Similarly, no clear trends could be observed within the separate ship classes. For example, age of the ship class, crew size, weapons capability, and operating days at sea appeared to vary in relationship to attrition within different classes of ships. On the other hand, evidence of a relationship between attrition and ship type was found when the data were analyzed using the third format. Here, ship classes were grouped into one of five broad mission categories--cruisers, destroyers, and frigates (CAT 1),

amphibious ships (CAT 2), oilers (CAT 3), minesweepers (CAT 4), and repair ships (CAT 5). Cruisers, destroyers, and frigates (CAT 1) had the lowest loss rates overall (all three cohorts combined). Repair ships (CAT 5) and minesweepers (CAT 4) had similarly low loss rates. The highest loss rates were found for oilers (CAT 3) and amphibious ships (CAT 2).

There are several possible hypotheses that may explain the observed trends in attrition by mission category. Cruisers, destroyers, and frigates (CAT 1) have long been regarded by many Surface warfare sailors as the "most glamorous" ships in the fleet. This image has included perceptions, true or false, that warships provide sailors with greater challenge, prestige, opportunities for warfare skill development, and "importance." Thus, among many Surface Warfare officers and enlisted sailors alike, cruisers, destroyers, and frigates are frequently the most sought-after ships for duty assignment. This introduces the opinion of some in the Surface Warfare Navy that, in general, more qualified leaders (in commanding officer and executive officer positions) are being assigned to these ships than to others. This may partially explain the difference in attrition between ship types, assuming that attrition is influenced to some extent by the greater abilities or higher achievements of senior personnel (officer and enlisted) on the ship. While this may offer a possible explanation for differences in cruisers, destroyers, and frigates, it may not be as valid for minesweepers and repair

ships. Across ship types, the presence and relative influence of other variables may explain observed differences in loss rates.

As observed in Chapter III, cruisers, destroyers, and frigates generally receive a slightly higher caliber sailor, based upon AFQT mean percentile scores and educational level. This occurs because more technically qualified enlisted personnel are required on these ships. Since education and aptitude are linked with success in naval service, this distribution of enlisted talent may also provide a partial explanation for lower attrition rates on such ships.

As previously noted, a combination of factors may influence attrition including crew/ship performance, number of operating days at sea, and command climate. These variables should be explored to more fully determine which may serve to increase or decrease attrition across varying ship types. Multivariate analysis techniques should be applied in attempts to model attrition as a function of personnel, ship, deployment and other data.

B. RECOMMENDATIONS

This research suggests that there is a relationship between ship type and first-term enlisted attrition. These results raise several questions:

- Given the loss rates among ships within differing mission categories, is the difference large enough to warrant enlisted and officer manning policy changes in an attempt

to distribute more evenly personnel talent, given the unique requirements of each ship class?

- Given the technology of differing ships, is such a distribution of talent feasible?
- If the loss rate differences between ship types are determined to be significant enough to consider making policy changes, what negative and/or positive effects would these changes cause in the mission readiness of each ship class?
- What other variables unique to different ships, such as deployment cycle and operating days at sea, might be related to attrition differences between ships with different mission requirements?

There are several possibilities for future research that may help to determine the cause for differences in attrition among ship types. For example, one area of research could examine more directly the distribution of enlisted talent across ships in the fleet, given varying levels of complexity in ships with differing requirements for technically-skilled personnel. Additionally, a survey might be useful to examine whether there is a perception among surface warriors that duty on cruisers, destroyers, and frigates enhances a naval career more than on other ship classes. If so, are officer manning policies and the personnel detailing process influenced by this to the detriment of other ship classes? Finally, manpower planners and researchers should determine if attrition differences exert a disproportionate influence, negative or positive, on the readiness of different ship types.

Navy manpower experts agree that attrition is currently at unacceptably high levels. Navy records show that just three out of every five new recruits can be expected to complete a first term of enlistment. Although attrition will always exist, present levels are too high, with the cost in dollars reaching into the hundreds of millions, and the cost in readiness exacting an immeasurable toll. There is not just one cause of early separation, but many. With continued focus on this important issue, Navy manpower planners and leaders may more effectively reduce its impact on the readiness of the Surface Navy.

APPENDIX A

LOSS RATES BY RACIAL/ETHNIC GROUP

LOSS RATES BY RACE AND CATEGORY
FY77-80

CLASS	SHIPS		WHITE		BLACK		HISPANIC		OTHER		TOTAL	
	LOSSES	RATE	LOSSES	RATE	LOSSES	RATE	LOSSES	RATE	LOSSES	RATE	LOSSES	RATE
120	1	17.032	0	0	0	0	0	0	0	0	0	0
48	1	20.833	1	2.083	1	2.083	1	2.083	1	2.083	1	2.083
32	3	9.375	3	9.375	1	3.125	1	3.125	2	6.250	4	12.500
13	4	30.769	1	7.692	1	7.692	1	7.692	1	7.692	4	30.769
3	5	166.667	1	33.333	1	33.333	1	33.333	2	66.667	4	133.333
TOTALS	227	4.360	157	1.038	157	1.038	83	3.726	134	1.038	274	19.039

LOSS RATES BY RACE AND CATEGORY
FY81-84

CLASS	SHIPS	WHITE			BLACK			HISPANIC			OTHER			TOTAL		
		LOSSES	LOSS RATE	<34 MOS SERVICE	LOSSES	LOSS RATE	<34 MOS SERVICE	LOSSES	LOSS RATE	<34 MOS SERVICE	LOSSES	LOSS RATE	<34 MOS SERVICE	LOSSES	LOSS RATE	<34 MOS SERVICE
1	4	873	21.83	1,937	15.99	477	17.10	357	13.44	1,184	17.03	1,184	2,460	17.03	1,184	17.03
2	5	744	14.88	603	12.06	20	0.40	151	3.02	151	3.02	151	1,094	21.88	4,212	22.20
3	10	44	0.44	376	3.76	16	0.16	90	0.90	93	0.93	93	37	0.37	215	0.21
4	10	384	3.84	3,703	37.03	144	1.44	929	9.29	752	7.52	752	471	4.71	2,739	17.12
TOTALS	263	4,076	15.50	20,355	16.02	622	2.36	1,110	4.22	110	0.42	110	4,957	18.83	25,739	19.25

LOSS RATES BY RACE AND CATEGORY
FY85-88

CLASS	SHIPS	WHITE			BLACK			HISPANIC			OTHER			TOTAL			
		LOSSES	<34 MOS SERVICE	LOSS RATE	LOSSES	<34 MOS SERVICE	LOSS RATE	LOSSES	<34 MOS SERVICE	LOSS RATE	LOSSES	<34 MOS SERVICE	LOSS RATE	LOSSES	<34 MOS SERVICE	LOSS RATE	
1	185	1,427	11,233	12.721	1,898	73	590	12.372	17	30	17.288	1,772	14,076	12.528	1,898	12.721	
2	162	534	3,196	19.503	696	27	227	15.162	10	17	12.372	670	4,076	17.288	696	17.288	
3	37	19	2,738	15.079	39	26	185	15.384	3	5	10.000	29	338	17.288	39	17.288	
4	18	164	1,320	12.424	36	0	0	0.000	1	2	11.544	60	179	16.611	36	16.611	
5	11	2,713	18,613	14.575	623	156	1,008	11.544	4	64	12.734	209	1,094	12.617	623	12.617	
TOTALS	300											5,407	24,062	14.159			

APPENDIX B
LOSS RATES BY INDIVIDUAL SHIP

ATTRITION RATE BY CAT/CLASS

UIC	SHIP NAME	HULL NO	CAT/CLASS	FY77	FY78	FY79	FY80	TOTAL	AVG CREW	< 34 MO SERVICE	LOSS RATE (%)
20624	MISSISSIPPI	CGN40	1A		4	3	2	8	539	84.00	9.3233
20681	VIRGINIA	CGN38	1A	3	4	3		10	539	107.00	9.2439
20682	TEXAS	CGN39	1A	8	16	0	1	25	539	197.00	21.0933
20547	CALIFORNIA	CGN36	1B	8	21	1		30	539	196.00	21.0933
20669	SOUTH CAROLINA	CGN37	1B	8	15	4		27	539	198.00	21.0933
20712	TRUXTON	CGN35	1C	2	15	0		17	539	148.00	13.5240
20701	BAIKRIDGE	CGN25	1D	7	14	3		24	539	143.00	12.8271
20702	BONN BEACH	CGN9	1E	6	25	3		34	539	143.00	12.8271
22703	J. DANIELS	CG27	1G	4	12	1		17	539	151.00	15.8999
22704	WAIWRIGHT	CG28	1G	4	12	1		17	539	147.00	14.9791
22705	JOULE	CG29	1G	11	15	4		30	539	149.00	14.9791
22706	HORRETT	CG30	1G	8	17	3		28	539	149.00	14.9791
22709	STERRETT	CG31	1G	5	17	8		29	539	149.00	14.9791
22708	W. H. STANDLEY	CG32	1G	2	10	3		15	539	149.00	14.9791
22709	FOX	CG33	1G	2	15	0		17	539	149.00	14.9791
22688	BIDDLE	CG34	1G	6	9	1		16	539	149.00	14.9791
22689	LEAHY	CG19	1H	5	9	0		14	539	149.00	14.9791
22690	H-E-YARNELL	CG17	1H	12	10	6		28	539	149.00	14.9791
22691	W-DEM	CG18	1H	3	7	7		17	539	149.00	14.9791
22692	DAL E	CG20	1H	14	7	0		21	539	149.00	14.9791
22693	R-K-TURNER	CG21	1H	2	10	1		13	539	149.00	14.9791
22694	GRIFFIN	CG22	1H	12	7	0		19	539	149.00	14.9791
22695	ENGLAND	CG23	1H	3	5	3		11	539	149.00	14.9791
22696	HALSET	CG24	1H	3	6	3		12	539	149.00	14.9791
22697	REEVES	CG25	1H	3	6	3		12	539	149.00	14.9791
22698	FARRAGUT	CG26	1H	3	6	3		12	539	149.00	14.9791
22699	LUCE	CG27	1H	3	6	3		12	539	149.00	14.9791
22700	MACDONOUGH	DDG37	1J	3	6	3		12	539	149.00	14.9791
22701	COONTZ	DDG38	1J	10	16	2		28	539	149.00	14.9791
22702	KING	DDG39	1J	4	16	2		22	539	149.00	14.9791
22703	MAHAN	DDG40	1J	13	15	2		30	539	149.00	14.9791
22704	DAHLGREN	DDG41	1J	13	15	2		30	539	149.00	14.9791
22705	AV-PHATT	DDG42	1J	13	15	2		30	539	149.00	14.9791
22706	W-PRATT	DDG43	1J	13	15	2		30	539	149.00	14.9791
22707	DEMLY	DDG44	1J	13	15	2		30	539	149.00	14.9791
22708	PREDER	DDG45	1J	13	15	2		30	539	149.00	14.9791
22709	ADAMS	DDG46	1J	13	15	2		30	539	149.00	14.9791
22710	JOHN KING	DDG2	1K	8	17	0		25	539	149.00	14.9791
22711	LAWRENCE	DDG3	1K	5	17	3		25	539	149.00	14.9791
22712	C-V-TRICKETS	DDG4	1K	0	25	3		28	539	149.00	14.9791
22713	BARNEY	DDG5	1K	4	16	2		22	539	149.00	14.9791
22714	H-B-WILSON	DDG6	1K	4	16	2		22	539	149.00	14.9791
22715	MCCORMICK	DDG7	1K	10	12	3		25	539	149.00	14.9791
22716	TOMPSON	DDG8	1K	5	12	3		20	539	149.00	14.9791
22717	SAMPSON	DDG9	1K	4	6	1		11	539	149.00	14.9791
22718	SELLEKS	DDG10	1K	4	6	1		11	539	149.00	14.9791
22719	ROBINSON	DDG11	1K	4	6	1		11	539	149.00	14.9791
22720	MOELANAN	DDG12	1K	4	6	1		11	539	149.00	14.9791
22721	BUELL	DDG13	1K	4	6	1		11	539	149.00	14.9791
22722	BERKLEY	DDG14	1K	4	6	1		11	539	149.00	14.9791
22723	STRAUSS	DDG15	1K	4	6	1		11	539	149.00	14.9791
22724	CONYNGHAM	DDG16	1K	4	6	1		11	539	149.00	14.9791
22725	SEMME	DDG17	1K	4	6	1		11	539	149.00	14.9791
22726	TATMALL	DDG18	1K	4	6	1		11	539	149.00	14.9791
22727		DDG19	1K	4	6	1		11	539	149.00	14.9791

ATTRITION RATE BY CAT/CLASS

IIC	SHIP NAME	HULL NO	CAT/CLASS	FY77	FY78	FY79	FY80	TOTAL	AVG CREW	< 34 MO SERVICE	LOSS RATE (%)
U4080	GOLDSBOROUGH	DDG20	1K	7	4	3	3	14	339	159.00	8.00
U4087	COCORANE	DDG21	1K	10	9	3	3	21	339	134.00	15.00
U4088	STOUDERT	DDG22	1K	6	7	0	0	20	339	140.00	14.00
U4090	BYRD	DDG23	1K	9	13	0	0	22	339	128.00	23.00
U4091	WADDILL	DDG24	1K	5	10	5	2	21	339	133.00	18.00
20574	SPRUANCE	DDG25	1L	4	4	5	5	19	310	133.00	9.00
20575	P.F. FUSTER	DD963	1L	5	5	3	3	18	310	133.00	9.00
20576	KINKAID	DD964	1L	2	2	4	3	11	310	80.00	13.00
20586	HEWITT	DD965	1L	2	2	4	3	11	310	140.00	17.00
20587	ELLIOTT	DD966	1L	2	2	0	0	4	310	99.00	24.00
20588	RADFORD	DD967	1L	2	2	0	0	4	310	140.00	17.00
20589	PETERSON	DD968	1L	2	2	0	0	4	310	140.00	17.00
20590	CARON	DD969	1L	11	15	3	1	29	310	125.00	19.00
20591	BROUKE	DD970	1L	2	6	7	7	22	254	107.00	21.00
U4092	RAMSEY	FFG1	1M	2	7	0	4	13	234	77.00	15.00
U4093	SCHOFIELD	FFG2	1M	2	7	0	4	13	234	77.00	15.00
U4094	TALBOT	FFG3	1M	6	13	3	3	25	234	99.00	22.00
U4095	R.L. PAGE	FFG4	1M	6	6	4	3	25	234	103.00	18.00
U4098	J.A. FURER	FFG5	1M	3	6	4	3	16	254	100.00	15.00
20049	HEMES	FFG6	1M	7	11	6	2	26	254	101.00	13.00
20050	BOWEN	FFG7	1M	4	7	0	0	11	270	105.00	18.00
20051	PAUL	FFG8	1M	4	6	0	0	10	270	93.00	19.00
20052	AYLWIN	FFG9	1M	6	6	0	0	12	270	96.00	16.00
20053	MONTGOMERY	FFG10	1M	6	6	0	0	12	270	92.00	20.00
20054	COOK	FFG11	1M	6	6	0	0	12	270	92.00	20.00
20055	MCCANNULLESS	FFG12	1M	11	12	3	2	28	270	86.00	22.00
20056	BEARY	FFG13	1M	5	4	3	2	14	270	73.00	19.00
20057	KIRK	FFG14	1M	7	4	3	2	16	270	114.00	14.00
20058	BREWTON	FFG15	1M	2	2	2	2	8	270	103.00	19.00
20066	BARBY	FFG16	1M	3	3	0	0	6	270	87.00	14.00
20067	BROWN	FFG17	1M	3	3	0	0	6	270	64.00	17.00
20068	AIMSWORTH	FFG18	1M	3	3	0	0	6	270	64.00	17.00
20070	AIR	FFG19	1M	2	2	0	0	4	270	71.00	19.00
20071	HART	FFG20	1M	2	2	0	0	4	270	91.00	15.00
20072	CAPODANNO	FFG21	1M	2	2	0	0	4	270	102.00	16.00
20073	PHARRIS	FFG22	1M	5	5	1	1	11	270	98.00	14.00
20075	TRUETT	FFG23	1M	4	4	0	0	8	270	72.00	10.00
20077	MUIRMASTER	FFG24	1M	3	3	0	0	6	270	106.00	14.00
20078	KNOX	FFG25	1M	6	3	3	2	14	270	126.00	10.00
20079	HEPBURN	FFG26	1M	3	3	2	2	10	270	85.00	19.00
20081	CONSOLE	FFG27	1M	3	1	2	2	8	270	81.00	19.00
20082	RATHERFORD	FFG28	1M	1	1	0	0	2	270	85.00	18.00
20083	MAYERKORD	FFG29	1M	1	1	0	0	2	270	85.00	18.00
20084	W.S. STAMS	FFG30	1M	5	6	1	1	13	270	75.00	21.00
20087	WHIPPLE	FFG31	1M	3	10	1	1	15	270	95.00	21.00
20088	REASONER	FFG32	1M	4	6	1	1	12	270	94.00	20.00
20089	LUCKWOOD	FFG33	1M	4	8	1	1	14	270	88.00	19.00
20090	STEIN	FFG34	1M	2	5	5	4	16	270	105.00	10.00
20091	MARVIN SHIELDS	FFG35	1M	4	4	2	1	11	270	105.00	10.00
20092	HAMMOND	FFG36	1M	4	4	2	1	11	270	105.00	10.00
20093	VREELAND	FFG37	1M	1	6	4	2	13	270	98.00	10.00
20094	BAGLEY	FFG38	1M	1	7	0	0	8	270	10.00	28.00
20095	DOWNES	FFG39	1M	2	6	0	0	8	270	98.00	10.00
20096	BADGER	FFG40	1M	3	3	1	1	8	270	14.00	44.00

ATTRITION RATE BY CAT/CLASS

UIC	SHIP NAME	HULL NO	CAT/CLASS	FY77	FY78	FY79	FY80	TOTAL	AVG CREW	< 34 SERVICE	LOSS RATE (X)
54068	PEARLY	FF1073	1N	6	4	0	1	10	270	99.00	10.161
54069	H-E-HOLT	FF1074	1N	5	5	0	0	10	270	95.00	14.730
54070	FRIMING	FF1075	1N	5	7	1	0	13	270	78.00	16.666
54071	FANNING	FF1076	1N	6	10	1	2	19	270	65.352	22.352
54072	QUELLET	FF1077	1P	5	8	4	2	19	270	69.00	17.977
54073	GARDLAY	FF1040	1P	5	0	0	2	7	260	100.00	2.031
54038	BHADONNELL	FF1041	1P	3	0	0	2	5	260	170.00	26.103
54039	MCDONNELL	FF1042	1P	3	1	1	2	7	260	116.00	16.965
54040	BROMBY	FF1043	1P	4	3	7	0	14	260	84.00	17.894
54041	DAVIDSON	FF1044	1P	4	3	3	0	10	260	110.00	15.545
54042	VOGE	FF1045	1P	5	8	3	0	16	260	88.00	25.000
54043	KOELSCH	FF1046	1P	3	8	0	0	11	260	93.00	25.053
54044	DAVIDSON	FF1047	1P	3	8	0	0	11	260	88.00	17.894
54045	KOELSCH	FF1048	1P	3	7	0	0	10	260	93.00	25.053
07170	RALEIGH	LPD1	2A	8	16	5	1	30	400	177.00	17.499
07171	VANCOUVER	LPD2	2A	4	7	3	2	16	400	160.00	17.499
07172	AUSTIN	LPD3	2A	8	2	3	1	14	400	183.00	25.300
07173	OGDEN	LPD4	2A	8	2	3	1	14	400	183.00	25.300
07174	OGDEN	LPD5	2A	16	16	0	0	32	400	183.00	25.300
07175	OGDEN	LPD5	2A	16	16	0	0	32	400	183.00	25.300
07176	OGDEN	LPD5	2A	16	16	0	0	32	400	183.00	25.300
07177	DULUTH	LPD6	2A	10	10	0	0	20	400	183.00	25.300
07181	CLEVELAND	LPD7	2A	10	10	0	0	20	400	183.00	25.300
07182	DENVER	LPD8	2A	14	14	0	0	28	400	183.00	25.300
07183	DENVER	LPD9	2A	14	14	0	0	28	400	183.00	25.300
07184	JUNEAU	LPD10	2A	13	13	0	0	26	400	183.00	25.300
07195	SHREVEPORT	LPD11	2A	13	13	0	0	26	400	183.00	25.300
07196	NASHVILLE	LPD12	2A	13	13	0	0	26	400	183.00	25.300
07199	NASHVILLE	LPD13	2A	17	17	0	0	34	400	183.00	25.300
07200	NASHVILLE	LPD14	2A	17	17	0	0	34	400	183.00	25.300
07201	NASHVILLE	LPD15	2A	17	17	0	0	34	400	183.00	25.300
05844	PONCELESTON	LKAI13	2B	12	12	0	0	24	336	125.00	18.274
05845	CHARLESTON	LKAI13	2B	12	12	0	0	24	336	125.00	18.274
05846	DURHAM	LKAI14	2B	6	6	0	0	12	336	98.00	23.421
05847	MOBILE	LKAI15	2B	6	6	0	0	12	336	98.00	23.421
05848	SAINT LOUIS	LKAI15	2B	6	6	0	0	12	336	98.00	23.421
05849	EL PASO	LKAI16	2B	5	5	0	0	10	336	94.00	20.929
03132	SPIEGEL GROVE	LKAI17	2C	7	7	0	0	14	336	94.00	20.929
03133	ALAMO	LSD33	2C	7	7	0	0	14	336	94.00	20.929
03134	HERMITAGE	LSD34	2C	7	7	0	0	14	336	94.00	20.929
07203	ANCHORAGE	LSD35	2D	10	10	0	0	20	329	113.00	12.749
20012	PORILAND	LSD37	2D	17	17	0	0	34	329	127.00	12.749
20013	PENSACOLA	LSD38	2D	17	17	0	0	34	329	127.00	12.749
20014	MOUNT VERNON	LSD39	2D	17	17	0	0	34	329	127.00	12.749
20015	FORT FISHER	LSD39	2D	17	17	0	0	34	329	127.00	12.749
20016	PORT VERNON	LSD40	2D	17	17	0	0	34	329	127.00	12.749
20019	FORT FISHER	LSD40	2D	17	17	0	0	34	329	127.00	12.749
20020	MANITOWOC	LST1181	2E	18	18	0	0	36	241	92.00	22.418
20021	SUMNER	LST1181	2E	18	18	0	0	36	241	92.00	22.418
20022	FRESNO	LST1182	2E	11	11	0	0	22	241	92.00	22.418
20023	PEORIA	LST1183	2E	11	11	0	0	22	241	92.00	22.418
20024	FREDRICK	LST1184	2E	11	11	0	0	22	241	92.00	22.418
20025	SCHENECTADY	LST1185	2E	11	11	0	0	22	241	92.00	22.418
20026	CAYUGA	LST1186	2E	11	11	0	0	22	241	92.00	22.418
20027	TUSCALOOSA	LST1187	2E	11	11	0	0	22	241	92.00	22.418
20028	SAGINAW	LST1188	2E	11	11	0	0	22	241	92.00	22.418
20029	SAN BERNARDINO	LST1189	2E	11	11	0	0	22	241	92.00	22.418
20030	BOULDER	LST1190	2E	11	11	0	0	22	241	92.00	22.418
20031	RACINE	LST1191	2E	11	11	0	0	22	241	92.00	22.418
20032	SPARTANBURG CTY	LST1192	2E	11	11	0	0	22	241	92.00	22.418

ATTRITION RATE BY CAT/CLASS

SHIP NAME	HULL NO	CAT/CLASS	FY77	FY78	FY79	FY80	TOTAL	AVG CREW	< 34 SERVICE	LOSS RATE (%)
FAIRFAX CTY	LST1193	2F	3	9	2	3	17	241	08.00	17.518
LAMORE CTY	LST1194	2F	6	15	1	1	22	241	102.00	21.568
HARBOR CTY	LST1195	2F	12	15	3	1	29	241	102.00	25.909
HARLAN CTY	LST1196	2F	1	15	0	1	18	241	100.00	25.909
BARNSTABLE CTY	LST1197	2F	1	11	0	1	10	241	100.00	25.909
BOSTON CTY	LST1198	2F	1	11	0	1	10	241	100.00	25.909
NEWPORT	LST1199	2F	1	11	0	1	10	241	100.00	25.909
BLUE RIDGE	LCC119	2F	4	17	1	4	27	241	170.00	26.190
MOUNT WHITNEY	LCC20	2F	4	17	1	4	27	241	170.00	26.190
SURIBACHI	AES1	2A	5	20	3	4	35	277	246.00	14.529
MAUNA KEA	AES2	2A	3	16	3	3	22	347	136.00	23.529
HALEAKALA	AES3	2A	3	16	3	3	22	347	136.00	23.529
NITRO	AES4	2A	6	21	1	4	34	350	115.00	21.153
PYRO	AES7	2B	6	21	1	4	34	350	115.00	21.153
BUTTE	AES8	2B	6	20	1	4	33	350	119.00	24.369
SANTA BARBARA	AES9	2C	13	19	0	0	30	386	27.00	27.000
MOUNT HOOD	AES9	2C	13	19	0	0	30	386	27.00	27.000
FLINT	AES35	2C	7	20	1	1	29	386	14.00	14.000
SHASTA BAKER	AES35	2C	7	20	1	1	29	386	14.00	14.000
KISKA	AES35	2C	7	20	1	1	29	386	14.00	14.000
HARS	AES35	2C	7	20	1	1	29	386	14.00	14.000
NIAGARA FALLS	AES35	2C	7	20	1	1	29	386	14.00	14.000
WHITE PLAINS	AES35	2C	7	20	1	1	29	386	14.00	14.000
CONCORD	AES35	2C	7	20	1	1	29	386	14.00	14.000
SAN DIEGO	AES35	2C	7	20	1	1	29	386	14.00	14.000
SAN JOSE	AES35	2C	7	20	1	1	29	386	14.00	14.000
SYLVANIA	AES35	2C	7	20	1	1	29	386	14.00	14.000
ARMATCHEE	AES35	2C	7	20	1	1	29	386	14.00	14.000
CALISTO	AES35	2C	7	20	1	1	29	386	14.00	14.000
CANISTEO	AES35	2C	7	20	1	1	29	386	14.00	14.000
SACRAMENTO	AES35	2C	7	20	1	1	29	386	14.00	14.000
CAMDEN	AES35	2C	7	20	1	1	29	386	14.00	14.000
SEA TATTLE	AES35	2C	7	20	1	1	29	386	14.00	14.000
DETROIT	AES35	2C	7	20	1	1	29	386	14.00	14.000
WITCHITA	AES35	2C	7	20	1	1	29	386	14.00	14.000
MILWAUKEE	AES35	2C	7	20	1	1	29	386	14.00	14.000
KANSAS CITY	AES35	2C	7	20	1	1	29	386	14.00	14.000
SAVANNAH	AES35	2C	7	20	1	1	29	386	14.00	14.000
WABASH	AES35	2C	7	20	1	1	29	386	14.00	14.000
KALAMAZOO	AES35	2C	7	20	1	1	29	386	14.00	14.000
ROAMOKI	AES35	2C	7	20	1	1	29	386	14.00	14.000
CONSTANT	AES35	2C	7	20	1	1	29	386	14.00	14.000
ENGAGE	AES35	2C	7	20	1	1	29	386	14.00	14.000
ENHANCE	AES35	2C	7	20	1	1	29	386	14.00	14.000
EXCEL	AES35	2C	7	20	1	1	29	386	14.00	14.000
EXPLOIT	AES35	2C	7	20	1	1	29	386	14.00	14.000
EXPLOIT	AES35	2C	7	20	1	1	29	386	14.00	14.000
FEARLESS	AES35	2C	7	20	1	1	29	386	14.00	14.000
FORTIFY	AES35	2C	7	20	1	1	29	386	14.00	14.000
IMPVIOUS	AES35	2C	7	20	1	1	29	386	14.00	14.000
IMPLICIT	AES35	2C	7	20	1	1	29	386	14.00	14.000
IMPLICIT	AES35	2C	7	20	1	1	29	386	14.00	14.000

ATTRITION RATE BY CAT/CLASS

UIC	SHIP NAME	HULL NO	CAT/CLASS	FY77	FY78	FY79	FY80	TOTAL	AVG CREW	< 34 MO SERVICE	LOSS RATE (X)
07994	PLUCK	MS0466	4A		1			1	56	4.00	25.000
08146	CUNQUEST	MS0488	4A		1			1	56	5.00	19.999
08147	GALLANT	MS0489	4A		1	1		2	56	10.00	19.999
08150	PLEDGE	MS0492	4A	1				1	56	17.00	23.571
08157	ADROIT	MS0509	4A		1			1	56	17.00	23.571
08159	AFFRAY	MS0511	4A		1	1		2	56	37.00	28.571
06020	PRAIRIE	AD15	5A	13	20	8		41	827	278.00	15.933
06038	SIEPRA	AD19	5A	16	20	17	1	54	827	318.00	19.012
06039	YOSEMITE	AD19	5A	19	30	20	4	70	827	376.00	21.276
06064	SAMUEL GOMPERS	AD17	5B	6	44	12	4	66	1,286	331.00	19.333
06077	RUGET SOUND	AD18	5B	6	37	15	3	61	1,277	308.00	19.519
06044	SHEMADDAH	AD44	5C	13	36	21	3	73	847	340.00	19.642
08006	AJAX	AMS	5D	10	23	19	3	55	847	340.00	19.642
08008	VULCAN	ARR	5D	8	19	19	3	59	847	197.00	19.790
08081	JASON	ARR	5D	8	19	19	3	59	847	197.00	19.790
	TOTALS		227	1,429	2,411	1,190	238	5,274	453.0	27,701.00	19.039

ATTRITION RATE BY CAT/CLASS

UIC	SHIP NAME	MULL NO	CAT/CLASS	FY81	FY82	FY83	FY84	TOTAL	AVG CREW	< 34 MO SERVICE	LOSS RATE (X)
20024	MISSISSIPPI	C6N40	1A	5	3	8	2	18	539	168.00	10.714
20081	VIRGINIA	C6N38	1A	4	6	8		18	539	149.00	15.120
20082	TEXAS	C6N39	1A	5	6	8		22	539	148.00	15.166
20054	ARKANSAS	C6N41	1A	3	7	3		8	570	57.00	14.035
20067	CALIFORNIA	C6N37	1B	4	10	7		21	570	146.00	10.958
20092	SOUTH CAROLINA	C6N35	1C	5	5	3		13	569	153.00	11.764
32712	TRUXTON	C6N35	1C	5	5	3		13	569	153.00	11.764
32700	BAINBRIDGE	C6N9	1C	8	17	13		43	444	194.00	23.084
03071	LONG BEACH	C620	1C	8	8	13		18	444	81.00	20.987
52701	BEL KNAP	C627	1C	3	14	8		17	444	130.00	20.987
52703	J. DANIELS	C628	1C	4	8	8		17	444	118.00	19.849
52704	WAINWRIGHT	C629	1C	3	7	8		14	444	118.00	19.849
52705	HOUME	C630	1C	3	7	8		14	444	118.00	19.849
52706	STERRETT	C631	1C	3	7	8		14	444	118.00	19.849
52707	H. H. STANDLEY	C632	1C	3	7	8		14	444	118.00	19.849
52708	FOX	C633	1C	1	7	11		12	444	118.00	19.849
52709	BIDDLE	C634	1C	1	7	11		12	444	118.00	19.849
52087	LEAHY	C610	1H	5	14	12		23	397	144.00	23.084
52088	W. YARNELL	C617	1H	5	14	12		23	397	144.00	23.084
52089	H. WARDEN	C618	1H	3	24	13		30	397	144.00	23.084
52090	W. DALY	C619	1H	6	7	8		15	397	144.00	23.084
52091	R. K. TURNER	C620	1H	1	6	8		15	397	144.00	23.084
52092	G. T. DOLY	C621	1H	2	7	8		15	397	144.00	23.084
52093	ENGLAND	C622	1H	3	16	7		18	397	144.00	23.084
52094	H. ALSEY	C623	1H	10	18	9		28	397	144.00	23.084
52095	REEVES	C624	1H	3	6	4		15	397	144.00	23.084
21430	KIDD	DDG994	1H	2	6	3		11	318	147.00	14.705
21431	C. ALLAGHAN	DDG995	1H	2	6	3		11	318	147.00	14.705
21432	S. COTT	DDG996	1H	2	6	3		11	318	147.00	14.705
21433	F. HANDLEM	DDG997	1H	2	6	3		11	318	147.00	14.705
21434	F. FRAGUT	DDG998	1H	2	6	3		11	318	147.00	14.705
21435	L. UCE	DDG999	1H	2	6	3		11	318	147.00	14.705
22233	M. DONOUGH	DDG38	1J	10	11	1		12	370	86.00	13.953
22234	C. DONTZ	DDG39	1J	10	11	1		12	370	86.00	13.953
22235	KING	DDG40	1J	5	7	0		12	370	86.00	13.953
22236	M. HAN	DDG41	1J	5	7	0		12	370	86.00	13.953
22237	D. AHLGREN	DDG42	1J	5	7	0		12	370	86.00	13.953
22083	W. V. PRATT	DDG43	1J	4	10	2		19	370	102.00	23.923
22084	H. WEY	DDG44	1J	4	7	7		19	370	102.00	23.923
22085	P. REBLE	DDG45	1J	3	6	7		19	370	102.00	23.923
04068	A. ADAMS	DDG46	1K	4	10	2		19	370	102.00	23.923
04069	J. KING	DDG47	1K	1	8	5		15	370	98.00	21.500
04070	L. WRENCE	DDG48	1K	1	8	5		15	370	98.00	21.500
04071	C. V. RICKETS	DDG49	1K	2	6	8		17	370	102.00	23.923
04072	B. ARNEY	DDG50	1K	6	5	0		11	370	94.00	20.760
04073	H. B. WILSON	DDG51	1K	6	5	0		11	370	94.00	20.760
04074	M. C. ORR	DDG52	1K	2	2	2		7	370	105.00	24.469
04075	T. TOWERS	DDG53	1K	2	2	2		7	370	105.00	24.469
04076	S. TAMPSON	DDG54	1K	5	10	1		17	370	106.00	24.357
04077	R. LLEWIS	DDG55	1K	6	4	0		11	370	89.00	19.867
04078	R. JOHNSON	DDG56	1K	6	4	0		11	370	89.00	19.867
04079	H. OEL	DDG57	1K	2	4	0		7	370	126.00	30.938
04080		DDG58	1K	2	4	0		7	370	126.00	30.938
04081		DDG59	1K	2	4	0		7	370	126.00	30.938
04082		DDG60	1K	2	4	0		7	370	126.00	30.938
04083		DDG61	1K	2	4	0		7	370	126.00	30.938
04084		DDG62	1K	2	4	0		7	370	126.00	30.938
04085		DDG63	1K	2	4	0		7	370	126.00	30.938
04086		DDG64	1K	2	4	0		7	370	126.00	30.938
04087		DDG65	1K	2	4	0		7	370	126.00	30.938
04088		DDG66	1K	2	4	0		7	370	126.00	30.938
04089		DDG67	1K	2	4	0		7	370	126.00	30.938
04090		DDG68	1K	2	4	0		7	370	126.00	30.938
04091		DDG69	1K	2	4	0		7	370	126.00	30.938
04092		DDG70	1K	2	4	0		7	370	126.00	30.938
04093		DDG71	1K	2	4	0		7	370	126.00	30.938
04094		DDG72	1K	2	4	0		7	370	126.00	30.938
04095		DDG73	1K	2	4	0		7	370	126.00	30.938
04096		DDG74	1K	2	4	0		7	370	126.00	30.938
04097		DDG75	1K	2	4	0		7	370	126.00	30.938
04098		DDG76	1K	2	4	0		7	370	126.00	30.938
04099		DDG77	1K	2	4	0		7	370	126.00	30.938
04100		DDG78	1K	2	4	0		7	370	126.00	30.938
04101		DDG79	1K	2	4	0		7	370	126.00	30.938
04102		DDG80	1K	2	4	0		7	370	126.00	30.938
04103		DDG81	1K	2	4	0		7	370	126.00	30.938
04104		DDG82	1K	2	4	0		7	370	126.00	30.938
04105		DDG83	1K	2	4	0		7	370	126.00	30.938
04106		DDG84	1K	2	4	0		7	370	126.00	30.938
04107		DDG85	1K	2	4	0		7	370	126.00	30.938
04108		DDG86	1K	2	4	0		7	370	126.00	30.938
04109		DDG87	1K	2	4	0		7	370	126.00	30.938
04110		DDG88	1K	2	4	0		7	370	126.00	30.938
04111		DDG89	1K	2	4	0		7	370	126.00	30.938
04112		DDG90	1K	2	4	0		7	370	126.00	30.938
04113		DDG91	1K	2	4	0		7	370	126.00	30.938
04114		DDG92	1K	2	4	0		7	370	126.00	30.938
04115		DDG93	1K	2	4	0		7	370	126.00	30.938
04116		DDG94	1K	2	4	0		7	370	126.00	30.938
04117		DDG95	1K	2	4	0		7	370	126.00	30.938
04118		DDG96	1K	2	4	0		7	370	126.00	30.938
04119		DDG97	1K	2	4	0		7	370	126.00	30.938
04120		DDG98	1K	2	4	0		7	370	126.00	30.938
04121		DDG99	1K	2	4	0		7	370	126.00	30.938
04122		DDG100	1K	2	4	0		7	370	126.00	30.938

ATTRITION RATE BY CAT/CLASS

UIC	SHIP NAME	HULL NO	CAT/CLASS	FY81	FY82	FY83	FY84	TOTAL	AVG CREW	< 34 MO SERVICE	LOSS RATE (X)
U4080	BUCHANAN	DDG14	1K	2	17	0	1	23	39	120.00	17.163
U4081	BURKLEY	DDG15	1K	2	6	2	1	3	39	103.00	11.423
U4082	SIRAUSS	DDG16	1K	2	18	2	3	18	39	83.00	11.095
U4083	CONYNGHAM	DDG17	1K	0	14	1	3	20	39	143.00	23.779
U4084	SEMMES	DDG18	1K	0	10	5	2	17	39	95.00	20.853
U4085	TATNALL	DDG19	1K	1	4	2	1	11	39	71.00	16.923
U4086	GOLDSBOROUGH	DDG20	1K	1	11	0	1	15	39	73.00	21.917
U4087	COCHRANE	DDG21	1K	4	6	0	1	16	39	62.00	27.419
U4088	STODDERT	DDG22	1K	1	7	0	1	17	39	118.00	22.033
U4090	BYRD	DDG23	1K	8	0	0	1	20	39	88.00	14.772
U4091	WADDELL	DDG24	1K	3	0	1	1	17	39	72.00	14.651
U4092	SPRUANCE	DDG25	1L	4	1	2	1	17	39	76.00	21.052
U4093	P.F. FOSTER	DDG26	1L	7	3	3	1	16	39	90.00	21.052
U4094	KINHAID	DDG27	1L	5	3	3	1	15	39	76.00	17.409
U4095	HELLIOTT	DDG28	1L	7	3	3	1	15	39	96.00	17.105
U4096	WELLS	DDG29	1L	3	9	2	1	18	39	98.00	21.951
U4097	RADFORD	DDG30	1L	4	12	0	2	18	39	78.00	20.681
U4098	PETERSON	DDG31	1L	3	6	3	2	15	39	89.00	20.853
U4099	CARON	DDG32	1L	6	6	3	1	17	39	80.00	21.249
U4100	RAY	DDG33	1L	1	5	1	2	12	39	79.00	15.189
U4101	OLDENDORF	DDG34	1L	1	3	0	2	12	39	91.00	15.582
U4102	JOHN YOUNG	DDG35	1L	1	3	0	1	12	39	77.00	22.027
U4103	CORTE DE GRASSE	DDG36	1L	1	3	0	1	12	39	91.00	19.909
U4104	ORRILL	DDG37	1L	4	0	0	1	15	39	88.00	19.909
U4105	MERRILL	DDG38	1L	6	4	0	2	14	39	95.00	13.844
U4106	BRISCOE	DDG39	1L	2	6	3	2	13	39	80.00	13.749
U4107	STUMP	DDG40	1L	3	5	3	1	12	39	84.00	19.060
U4108	CONOLLY	DDG41	1L	1	4	3	1	11	39	98.00	19.318
U4109	MOORHEAD	DDG42	1L	1	6	3	1	11	39	91.00	12.070
U4110	SMITH	DDG43	1L	1	7	3	2	13	39	80.00	18.337
U4111	LYNCH	DDG44	1L	5	3	2	1	11	39	80.00	17.097
U4112	LEWIS	DDG45	1L	2	3	1	1	7	39	80.00	19.117
U4113	HARRY W. HILL	DDG46	1L	2	3	4	5	14	39	90.00	18.319
U4114	OBANNON	DDG47	1L	1	3	3	1	13	39	91.00	18.319
U4115	THORN	DDG48	1L	2	11	3	1	15	39	64.00	20.312
U4116	DEYO	DDG49	1L	1	12	4	2	15	39	48.00	16.060
U4117	INGER SOLL	DDG50	1L	1	5	4	2	12	39	57.00	35.087
U4118	LIFE	DDG51	1L	3	0	1	1	20	39	62.00	16.129
U4119	FLETCHER	FFG1	1M	0	2	1	1	21	39	64.00	16.129
U4120	BROOKE	FFG2	1M	0	1	1	1	21	39	64.00	25.000
U4121	AMSEY	FFG3	1M	0	1	1	1	21	39	64.00	25.000
U4122	SCHOFIELD	FFG4	1M	0	1	1	1	21	39	64.00	25.000
U4123	RALPHAGE	FFG5	1M	0	1	1	1	21	39	64.00	25.000
U4124	J. LEUPER	FFG6	1M	0	1	1	1	21	39	64.00	25.000
U4125	HEWES	FFG7	1M	0	1	1	1	21	39	64.00	25.000
U4126	BOWEN	FFG8	1M	0	1	1	1	21	39	64.00	25.000
U4127	PAUL	FFG9	1M	0	1	1	1	21	39	64.00	25.000
U4128	AYLMIN	FFG10	1M	0	1	1	1	21	39	64.00	25.000
U4129	MONTGOMERY	FFG11	1M	0	1	1	1	21	39	64.00	25.000
U4130	COOK	FFG12	1M	0	1	1	1	21	39	64.00	25.000

ATTRITION RATE BY CAT/CLASS

JIC	SHIP NAME	HULL NO	CAT/CLASS	FY81	FY82	FY83	FY84	TOTAL	AVG CREW	< 34 MO SERVICE	LOSS RATE (%)
20055	MCCANDLESS	FF1084	IN	6	2	3	2	17	270	81.00	13.287
20056	BEARY	FF1085	IN	3	2	3	1	9	270	86.00	19.906
20057	BRENTON	FF1089	IN	1	2	3	1	7	270	81.00	19.753
20058	KIRBY	FF1083	IN	1	14	8	1	26	270	89.00	29.823
20069	BROWNE	FF1080	IN	2	6	4	1	19	270	85.00	19.846
20068	HART	FF1090	IN	1	10	3	2	16	270	87.00	19.235
20071	AINSWORTH	FF1092	IN	1	7	3	1	12	270	89.00	18.583
20072	CAPODANNO	FF1093	IN	1	9	3	1	14	270	92.00	17.585
20073	PHUETT	FF1095	IN	2	13	9	1	27	270	93.00	21.052
20075	MUIRMASTER	FF1097	IN	1	14	9	1	24	270	83.00	16.285
20077	KNOX	FF1052	IN	1	6	5	1	13	270	77.00	23.376
20050	HEPBURN	FF1055	IN	1	6	5	1	13	270	79.00	16.455
20051	COMNOLE	FF1059	IN	1	5	3	1	10	270	66.00	15.151
20052	RATHEURNE	FF1057	IN	1	5	3	1	10	270	91.00	28.395
20053	MEYERKORD	FF1058	IN	1	5	3	1	10	270	73.00	19.573
20054	W-S-SIMS	FF1062	IN	2	1	4	1	8	270	62.00	15.193
20057	WHIASOMER	FF1063	IN	7	5	3	1	16	270	78.00	15.389
20058	REASOMER	FF1064	IN	1	5	3	1	10	270	91.00	28.395
20059	LOCWOOD	FF1065	IN	1	7	4	1	13	270	63.00	19.573
20060	STEIN	FF1067	IN	1	6	3	1	11	270	82.00	15.389
20061	MARTIN SHIELDS	FF1069	IN	1	7	3	1	12	270	75.00	12.473
20062	HAMMOND	FF1068	IN	1	6	3	1	11	270	96.00	24.473
20063	VREELAND	FF1066	IN	1	7	3	1	12	270	59.00	32.203
20064	BAGLEY	FF1063	IN	1	8	7	1	17	270	77.00	15.384
20065	DOWMES	FF1070	IN	3	2	3	1	9	270	65.00	15.384
20068	BADGER	FF1071	IN	3	2	3	1	9	270	48.00	15.384
20069	PEARRY	FF1073	IN	1	2	3	1	7	270	91.00	28.395
20070	H-E-HOLT	FF1074	IN	1	2	3	1	7	270	75.00	15.389
20071	TRIPPE	FF1075	IN	5	4	2	1	12	270	75.00	15.389
20072	FANING	FF1076	IN	5	4	2	1	12	270	71.00	14.584
20073	QUELLET	FF1077	IN	5	8	4	1	16	270	99.00	24.590
20074	GARCIA	FF1040	TP	2	5	3	4	14	260	99.00	11.561
20038	BRADLEY	FF1041	TP	2	5	3	2	12	260	57.00	14.561
20039	MCDONNELL	FF1042	TP	1	2	2	1	6	260	37.00	14.561
20040	BRUMBY	FF1044	TP	1	10	2	2	15	260	54.00	20.370
20041	DAVIDSON	FF1045	TP	5	9	6	0	20	260	87.00	29.857
20042	VOGE	FF1047	TP	5	9	6	0	20	260	83.00	28.388
20043	SAMPLE	FF1049	TP	1	4	0	0	5	260	09.00	23.144
20045	KOELSCH	FF1048	TP	1	4	0	0	5	260	09.00	23.144
20046	DAVID	FF1048	TP	1	4	0	0	5	260	09.00	23.144
20047	FAHRIUN	FFG22	TP	1	5	0	0	6	195	10.00	1.000
20077	WILLIAMS	FFG24	TP	1	5	0	0	6	195	11.00	1.000
20079	GALLERY	FFG26	TP	1	2	1	1	5	195	17.00	17.067
20032	MCINERNEY	FFG8	TP	2	1	1	1	5	195	32.00	15.825
07170	RALEIGH	LPD1	PA	5	13	7	1	29	400	109.00	27.000
07171	VANCOUVER	LPD2	PA	7	17	9	1	32	400	126.00	31.500
07175	AUSTIN	LPD5	PA	2	8	5	2	17	400	136.00	34.000
07176	OGDEN	LPD5	PA	2	9	5	1	19	400	135.00	33.750
07177	DULUTH	LPD9	PA	6	18	9	1	34	400	134.00	33.500
07181	CLEVELAND	LPD9	PA	6	18	9	1	34	400	134.00	33.500
07182	DUBUQUE	LPD8	PA	2	2	1	1	6	400	104.00	26.000

ATTRITION RATE BY CAT/CLASS

UIC	SHIP NAME	HULL NO	CAT/CLASS	FY81	FY82	FY83	FY84	TOTAL	AVG CREW	< 34 MO SERVICE	LOSS RATE (%)
07183	DENVER	LPD91	2A	10	13	0	1	30	400	147.00	20.409
07184	JUNEAU	LPD10	2A	7	10	13	3	42	400	135.00	31.111
07195	SHREVEPORT	LPD12	2A	4	6	10	2	30	400	104.00	28.846
07196	NASHVILLE	LPD13	2A	5	6	9	2	30	400	116.00	17.241
07200	NANTON	LPD14	2A	11	15	9	2	34	400	148.00	22.972
07201	PONCE	LPD15	2A	6	10	9	2	24	400	101.00	14.900
05864	CHARLESTON	LKA113	2B	1	7	3	1	15	336	66.00	17.641
05845	DURHAM	LKA114	2B	1	7	4	1	13	336	69.00	18.640
05849	MOBILE	LKA115	2B	2	7	7	2	18	336	40.00	50.454
05847	SAINT LOUIS	LKA116	2B	2	7	7	2	18	336	40.00	50.454
03132	EL PASO	LKA117	2C	2	8	9	2	19	329	43.00	24.258
03133	SPIEGEL GROVE	LSD33	2C	1	10	9	2	19	329	137.00	19.708
03134	ALAMO	LSD34	2C	5	10	3	3	23	329	97.00	23.711
07203	HERMITAGE	LSD36	2D	2	10	0	2	24	331	94.00	25.331
07203	ANCHORAGE	LSD37	2D	5	13	0	1	24	331	19.467	19.467
20012	PORTLAND	LSD37	2D	5	13	0	1	24	331	19.467	19.467
20013	PENSACOLA	LSD38	2D	5	13	0	1	24	331	19.467	19.467
20013	MOUNT VERNON	LSD38	2D	8	16	10	1	26	331	105.00	24.761
20014	FORT FISHER	LSD30	2D	3	6	6	1	20	331	105.00	24.761
20015	MANITOWOC	LSD40	2D	3	6	4	1	14	331	103.00	23.592
20019	SUMNER	LST1131	2F	4	5	4	1	16	241	107.00	19.277
20020	FRESNO	LST1132	2F	4	5	4	1	16	241	107.00	19.277
20021	PEORIA	LST1181	2F	4	5	3	1	14	241	65.00	15.277
20022	FREDRICK	LST1184	2F	4	6	5	4	19	241	72.00	15.277
20023	SCHENECTADY	LST1185	2F	4	6	5	4	19	241	82.00	14.817
20025	CAYUGA	LST1185	2F	4	6	5	4	19	241	82.00	14.817
20026	TUSCALOUSA	LST1187	2F	4	6	0	1	11	241	70.00	25.174
20027	SAGINAW	LST1187	2F	4	6	3	1	14	241	70.00	25.174
20028	SAN BERNARDINO	LST1189	2F	7	16	1	1	24	241	104.444	11.444
20029	BUILDER	LST1190	2F	7	16	3	2	25	241	92.00	10.394
20030	RACINE	LST1191	2F	7	16	3	1	24	241	43.00	17.051
20031	SPARTANBURG CTY	LST1192	2F	1	10	3	1	15	241	36.00	17.441
20032	FAIRFAX CTY	LST1193	2F	1	10	3	1	15	241	36.00	17.441
20033	LAMOUR CTY	LST1194	2F	4	10	3	2	19	241	94.00	15.957
21221	BARBOUR CTY	LST1195	2F	4	11	3	2	20	241	68.00	29.441
21224	HARLAN CTY	LST1195	2F	4	7	7	1	23	241	65.00	18.491
21225	HARMING CTY	LST1197	2F	4	7	11	1	23	241	65.00	18.491
21226	BRIAR CTY	LST1193	2F	4	7	11	1	23	241	65.00	18.491
58179	NEWPORT	LST1179	2F	5	17	3	2	27	241	75.00	20.819
58180	BLUET RIDGE	LST1179	2F	5	17	3	2	27	241	75.00	20.819
58181	MOUNT WHITNEY	LCC20	2G	5	17	3	2	27	241	76.00	13.289
04821	SURIBACHI	AER1	2A	14	23	7	3	50	277	38.00	13.289
04822	MAUNA KUA	AER2	2A	14	18	4	1	36	277	104.00	23.258
05330	HALEAKALA	AER3	2A	4	14	5	2	24	347	65.00	29.250
05331	NITMO	AER3	2A	11	17	4	3	32	330	110.00	22.727
05332	PYRO	AER4	2B	4	10	4	3	27	330	106.00	25.471
05339	BUTTE	AER4	2B	5	14	3	3	30	330	54.00	12.967
21111	SANTA BARBARA	AER5	2C	10	18	9	2	39	386	102.00	19.607
21112	MOUNT HOUB	AER5	2C	10	14	9	2	35	386	100.00	25.000
21113	FLINT	AER2	2C	6	21	7	1	35	386	104.00	25.000
21114	SHASTA	AER3	2C	5	18	7	1	31	386	135.00	23.925
21115	MOUNT BAKER	AER3	2C	5	18	7	1	31	386	135.00	23.925
21243	KISKA	AER5	2C	3	18	3	2	26	386	95.00	19.285

ATTRITION RATE BY CAT/CLASS.

UIC	SHIP NAME	HULL NO	CAT/CLASS	FY81	FY82	FY83	FY84	TOTAL	AVG CREW	< 34 MO SERVICE	LOSS RATE (%)
US051	MARS	3D	3D	10	4	10	1	25	411	196.00	15.000
US054	NIAGARA FALLS	AFS1	3D	4	16	10	2	32	411	192.00	18.004
US055	WHITE PLAINS	AFS4	3D	2	8	10	2	32	411	127.00	17.322
US056	CONCORD	AFS5	3D	7	21	15	2	34	411	197.00	35.051
27110	SAN DIEGO	AFS6	3D	2	10	8	2	10	411	150.00	12.799
27118	SAN JOSE	AFS7	3D	2	9	7	2	10	411	150.00	13.999
74025	SYLVANIA	AFS2	3D	7	14	12	2	28	352	1106.00	27.999
U4848	CALICO SAHATCHEE	A098	3E	0	10	12	2	22	352	138.00	23.184
U4849	CANISTEU	A099	3E	0	5	4	2	12	208	193.00	12.903
27861	CIMARRON	AU177	3F	2	12	6	2	20	208	121.00	10.528
27862	MONONGAHELA	AU178	3F	2	14	6	2	24	208	16.00	10.528
27863	MERIMALK	AOE1	3G	7	10	13	7	44	208	175.00	23.999
US033	SACRAMENTO	AOE2	3G	6	17	11	4	41	583	155.00	23.999
US040	CAMPELE	AOE3	3G	15	31	11	4	61	583	233.00	20.180
20120	SEATTLE	AOE4	3G	7	11	12	2	23	583	128.00	20.180
US049	DEITCHITA	AOE5	3G	7	10	9	2	23	442	1102.00	27.502
US050	MILWAUKEE	AOR1	3H	10	8	7	4	25	442	145.00	14.522
27122	KANSAS CITY	AOR2	3H	2	10	9	4	23	442	111.00	22.522
27123	SAVANNAH	AOR3	3H	2	15	9	5	23	442	124.00	18.548
27124	WABASH	AOR4	3H	2	8	5	2	18	442	103.00	17.475
27125	KALAMAZOO	AOR5	3H	3	8	6	2	19	442	124.00	18.548
27248	ROANOKE	AOR6	3H	10	14	11	2	27	442	102.00	20.660
07957	CONSTANT	MS0427	4A	1	1	1	1	4	56	16.00	10.500
07967	ENGAGE	MS0433	4A	3	3	2	2	10	56	16.00	10.500
07968	ENHANCE	MS0437	4A	3	3	1	2	9	56	11.00	36.363
07969	ESTEE	MS0438	4A	3	3	2	2	10	56	16.00	10.500
07970	EXCEL	MS0439	4A	1	3	2	2	8	56	12.00	10.660
07971	EXPLOIT	MS0441	4A	1	3	2	2	8	56	12.00	10.660
07972	EXULTANT	MS0442	4A	1	1	2	2	6	56	6.00	10.660
07973	FEARLESS	MS0443	4A	1	1	2	2	6	56	12.00	10.660
07974	FORTIFY	MS0444	4A	1	1	2	2	6	56	12.00	10.660
07975	IMPERVIUS	MS0445	4A	1	1	2	2	6	56	12.00	10.660
07976	IMPLICIT	MS0446	4A	1	1	2	2	6	56	12.00	10.660
07977	INFLECT	MS0447	4A	1	1	2	2	6	56	12.00	10.660
07978	PLUCK	MS0448	4A	1	1	2	2	6	56	12.00	10.660
07979	CONQUEST	MS0449	4A	1	2	2	2	7	56	15.00	19.999
08140	GALLANT	MS0450	4A	2	2	2	2	8	56	12.00	10.660
08147	PLEDGE	MS0451	4A	2	2	2	2	8	56	6.00	10.660
08150	ADRCIT	MS0452	4A	4	4	2	2	14	56	8.00	50.000
08159	AFFRAY	MS0453	4A	4	4	2	2	14	56	6.00	10.660
04020	PRAIRIE	AD15	5A	1	5	1	3	10	827	304.00	0.333
04030	SIEPRA	AD19	5A	1	10	2	1	14	827	24.00	0.333
04038	YOSEMITE	AD19	5A	5	10	2	6	23	827	227.00	14.096
04040	SAMUEL WOMPERS	AD17	5B	15	23	10	5	53	827	254.00	20.346
04048	PUGET SOUND	AD30	5C	8	20	10	2	40	827	338.00	19.797
US037	YELLOWSTONE	AD30	5C	5	20	10	2	40	827	338.00	19.797
21047	ACADIA	AD41	5D	17	17	10	2	46	1,277	100.00	12.129
21049	AJAX	AR5	5D	5	25	10	2	42	1,277	451.00	19.777
US058	VULCAN	AR5	5D	6	15	10	1	38	847	236.00	21.186
US059	JASON	AR5	5D	4	15	10	1	34	847	101.00	22.999
US060	TOTALS	263		979	2,237	1,491	250	4,957	391.0	25,739.00	14.258

ATTRITION RATE BY CAT/CLASS

UIC	SHIP NAME	HULL NO	CAT/CLASS	FY85	FY86	FY87	FY88	TOTAL	AVG CREW	< 34 MO SERVICE	LOSS RATE (%)
27024	MISSISSIPPI	CGN40	1A	1	1	4	1	15	539	124.00	12.090
27081	VIRGINIA	CGN34	1A	3	3	2	1	8	539	140.00	6.428
27082	TEXAS	CGN39	1A	2	4	2	1	10	539	116.00	6.890
27083	ARKANSAS	CGN41	1A	2	5	2	1	10	539	115.00	7.407
27084	CALIFORNIA	CGN37	1b	2	7	3	1	13	570	128.00	7.031
27089	SOUTH CAROLINA	CGN32	1b	3	11	3	1	18	570	129.00	13.661
27112	TRUXTON	CGN35	1c	3	11	3	1	18	566	136.00	13.061
27270	BAINBRIDGE	CGN25	1d	3	9	4	3	29	539	138.00	12.493
43051	LOMB BEACH	CGN9	1E	9	11	4	3	37	340	231.00	12.525
21281	YORKTOWN	CG48	1F	1	1	1	1	4	340	73.00	5.379
21293	TICONDEROGA	CG47	1F	2	3	2	1	8	444	157.00	6.369
22701	VELKNAP	CG20	1G	16	16	1	1	34	444	117.00	27.931
22703	BE DAMIELS	CG27	1G	0	0	1	1	2	444	93.00	14.520
22704	WAIWRIGHT	CG28	1G	0	0	3	1	4	444	94.00	14.893
22705	JOULET	CG29	1G	6	6	3	1	20	444	90.00	13.333
22706	MORNE	CG30	1G	1	1	3	1	6	444	129.00	13.509
22707	STERRETT	CG31	1G	5	1	3	1	10	444	105.00	13.809
22708	W. FOX	CG32	1G	2	15	4	1	22	444	85.00	24.705
22709	H. STANDLEY	CG33	1G	4	9	7	1	31	444	120.00	17.499
22711	BIDDLE	CG34	1G	1	2	3	1	7	444	112.00	8.035
22713	LEAHY	CG10	1H	3	6	3	1	13	397	82.00	13.414
22714	H-E YARNELL	CG17	1H	1	2	3	1	7	397	87.00	9.890
22715	WORDEN	CG18	1H	1	5	3	1	10	397	103.00	7.769
22716	DALY	CG19	1H	2	5	5	1	15	397	84.00	11.904
22717	TURNER	CG20	1H	3	6	5	1	21	397	111.00	11.711
22718	GRIDLEY	CG21	1H	2	8	5	1	18	397	86.00	17.441
22719	ENGLAND	CG22	1H	1	7	3	1	12	397	86.00	15.357
22720	HALSEY	CG23	1H	1	7	3	1	12	397	86.00	15.357
22721	REEVES	CG24	1H	4	7	3	1	19	397	86.00	15.357
22722	KIDD	DDG993	1J	1	5	3	1	10	318	90.00	17.230
21430	CALLAGHAN	DDG994	1J	1	7	3	1	12	318	70.00	9.060
21437	SCOTT	DDG995	1J	2	5	3	1	10	318	70.00	7.142
21438	CHARAULT	DDG996	1J	2	7	3	1	13	318	78.00	12.820
22231	FARAUT	DDG37	1J	4	3	3	1	11	318	101.00	17.920
22232	LUCERNE	DDG38	1J	3	4	3	1	11	318	94.00	13.829
22233	MACDONOUGH	DDG39	1J	3	5	3	1	12	318	80.00	13.749
22234	COOVERTZ	DDG40	1J	3	5	3	1	12	318	80.00	13.749
22235	KING	DDG41	1J	1	6	3	1	11	318	80.00	13.749
22236	MAHAN	DDG42	1J	1	6	3	1	11	318	80.00	13.749
22239	DAHLGREN	DDG43	1J	4	6	3	1	14	318	80.00	13.749
22240	W-VERRATT	DDG44	1J	6	6	3	1	18	318	80.00	13.749
22241	DEWEY	DDG45	1J	2	11	3	1	17	318	80.00	13.749
22242	PREBLE	DDG46	1J	2	11	3	1	17	318	80.00	13.749
22243	ADAMS	DDG47	1J	1	11	3	1	16	318	80.00	13.749
04068	JOHN KING	DDG3	1K	4	4	1	1	14	339	67.00	14.925
04070	LAWRENCE	DDG5	1K	3	4	1	2	14	339	67.00	14.925
04071	C. BRICKETS	DDG6	1K	3	4	1	2	14	339	67.00	14.925
04072	BARRETT	DDG9	1K	3	4	1	2	14	339	67.00	14.925
04073	MCCORMICK	DDG7	1K	3	4	1	2	14	339	67.00	14.925
04074	MCCORMICK	DDG8	1K	3	4	1	2	14	339	67.00	14.925
04075	TOMPSON	DDG9	1K	3	4	1	2	14	339	67.00	14.925
04076	SAMPSON	DDG10	1K	3	5	3	1	12	339	67.00	14.925

ATTRITION RATE BY CAT/CLASS

UIC	SHIP NAME	HULL NO	CAT/CLASS	FY85	FY86	FY87	FY88	TOTAL	AVG CREW	S34 MO SERVICE	LOSS RATE (%)
U4677	SELLERS	DDG11	1K	1	2	1	1	4	339	65.00	6.153
U4678	ROBISON	DDG12	1K	5	4	2	2	7	339	61.00	11.472
U4679	HOEL	DDG13	1K	3	3	3	3	15	339	106.00	12.264
U4680	BUCHANAN	DDG14	1K	3	10	3	3	15	339	75.00	19.999
U4681	BERKLEY	DDG15	1K	3	6	1	1	11	339	72.00	10.869
U4682	STRAUSS	DDG16	1K	3	5	2	1	11	339	77.00	12.987
U4683	CUNYNGHAM	DDG17	1K	3	6	2	1	17	339	72.00	18.478
U4684	SEMMES	DDG18	1K	3	6	2	1	17	339	66.00	10.144
U4685	TATINALL	DDG19	1K	3	6	2	1	17	339	60.00	13.483
U4686	GOLDSBOROUGH	DDG20	1K	1	10	2	2	13	339	55.00	15.244
U4687	COCHRANE	DDG21	1K	2	2	2	2	8	339	82.00	7.317
U4688	STODDERT	DDG22	1K	3	2	3	2	10	339	72.00	2.439
U4689	BYRD	DDG23	1K	6	7	4	4	19	339	78.00	15.384
U4690	WADDELL	DDG24	1K	3	9	3	3	12	339	57.00	24.358
U4691	SPURANGE	DDG25	1L	3	6	3	3	15	310	72.00	21.051
U4692	P.F. FOSTER	DDG26	1L	3	6	3	3	15	310	72.00	23.011
U4693	KINKAID	DDG27	1L	3	6	3	3	15	310	76.00	17.719
U4694	HEWITT	DDG28	1L	3	6	3	3	15	310	70.00	8.571
U4695	DDG29	DDG29	1L	3	4	2	2	12	310	81.00	14.914
U4696	ELLIOTT	DDG30	1L	3	3	2	2	10	310	69.00	5.797
U4697	RADFORD	DDG31	1L	3	3	3	1	10	310	75.00	15.999
U4698	PETERSON	DDG32	1L	4	3	3	1	11	310	82.00	10.975
U4699	CARON	DDG33	1L	3	7	2	2	12	310	76.00	17.708
U4700	RAY	DDG34	1L	3	7	2	2	12	310	72.00	6.944
U4701	OLDENBOHE	DDG35	1L	1	3	3	3	9	310	65.00	13.548
U4702	JOHN JOUNG	DDG36	1L	1	5	3	3	12	310	81.00	8.561
U4703	COMT DE GRASSE	DDG37	1L	1	2	2	2	7	310	72.00	8.944
U4704	DDG38	DDG38	1L	1	2	2	2	7	310	61.00	8.561
U4705	DDG39	DDG39	1L	1	2	2	2	7	310	84.00	18.750
U4706	MERTZEL	DDG40	1L	3	10	3	3	17	310	84.00	15.909
U4707	BRISQOE	DDG41	1L	3	6	3	3	15	310	84.00	8.333
U4708	STUMPF	DDG42	1L	3	4	3	1	11	310	84.00	10.204
U4709	CONGLY	DDG43	1L	5	6	4	1	16	310	79.00	15.189
U4710	MOOSBURGER	DDG44	1L	1	6	2	1	10	310	71.00	14.084
U4711	JOHN MARUCK	DDG45	1L	1	7	3	1	12	310	71.00	16.304
U4712	NICH LSON	DDG46	1L	4	7	3	1	15	310	72.00	9.359
U4713	JOHN ROUGERS	DDG47	1L	4	7	2	2	15	310	76.00	9.359
U4714	JEPTWICH	DDG48	1L	4	7	2	2	15	310	70.00	8.379
U4715	CUSHING	DDG49	1L	3	8	3	2	16	310	68.00	8.705
U4716	HARRY W. HILL	DDG50	1L	3	8	3	2	16	310	68.00	8.705
U4717	OBAMANN	DDG51	1L	4	7	3	1	15	310	92.00	22.222
U4718	THOMN	DDG52	1L	4	7	3	1	15	310	92.00	22.222
U4719	DEYO	DDG53	1L	5	6	3	1	15	310	76.00	23.809
U4720	INGERSOLL	DDG54	1L	3	5	3	1	12	310	76.00	15.789
U4721	FIFE	DDG55	1L	3	4	3	1	11	310	60.00	17.142
U4722	FLETCHER	DDG56	1L	3	4	3	1	11	310	60.00	17.142
U4723	HAYLER	DDG57	1L	1	6	2	2	11	310	74.00	14.864
U4724	BROCKE	DDG58	1M	1	6	2	2	11	310	90.00	4.883
U4725	RAMSEY	DDG59	1M	1	6	2	2	11	254	47.00	14.864
U4726	SCHOFFIELD	DDG60	1M	1	6	2	2	11	254	61.00	14.864
U4727	TALBOT	DDG61	1M	1	6	2	2	11	254	51.00	11.345
U4728	P.L. PAGE	DDG62	1M	3	5	3	1	12	254	48.00	12.200
U4729	J.A. FUGER	DDG63	1M	1	6	2	2	11	254	67.00	10.417
U4730	HEWES	DDG64	1M	1	6	2	2	11	254	68.00	11.769
U4731	BOWEN	DDG65	1M	2	5	3	1	11	270	65.00	13.452

ATTRITION RATE BY CAT/CLASS

UIC	SHIP NAME	HULL NO	CAT/CLASS	FY85	FY86	FY87	FY88	TOTAL	AVG CREW	< 34 MO SERVICE	LOSS RATE (%)
20U51	PAUL	FF1080	IN	6	3	3	1	11	270	70.00	12.714
20U52	ATLANTIN	FF1081	IN	2	3	3		5	270	57.00	8.771
20U53	MONTGOMERY	FF1092	IN	4	3	2	1	10	270	50.00	19.999
20U54	COOK	FF1083	IN	4	3	2		9	270	79.00	17.721
20U55	ACCANULLESS	FF1085	IN	1	2	3		6	270	42.00	16.860
20U56	BEARY	FF1085	IN	1	2	3		6	270	68.00	18.823
20U57	BREWTON	FF1087	IN	4	1	3		8	270	59.00	10.169
20U58	KIRK	FF1088	IN	1	2	2		5	270	70.00	8.999
20U59	BROWN	FF1089	IN	1	2	1		4	270	64.00	23.687
20U60	BROWN	FF1090	IN	1	1	1		3	270	49.00	6.081
20U61	AINSWORTH	FF1092	IN	1	1	1		3	270	70.00	6.999
20U62	HART	FF1093	IN	1	1	1		3	270	70.00	7.240
20U63	CAPORASINO	FF1093	IN	2	3	1		6	270	97.00	12.280
20U64	PHARRIS	FF1094	IN	1	1	2		4	270	57.00	14.754
20U65	TRUETT	FF1095	IN	1	1	2		4	270	46.00	13.043
20U66	MOINSTER	FF1097	IN	1	1	2		4	270	68.00	17.352
20U67	TRUETT	FF1052	IN	1	1	2		4	270	61.00	14.754
20U68	KNOX	FF1055	IN	1	1	1		3	270	61.00	17.352
20U69	HEPBURN	FF1059	IN	1	1	1		3	270	56.00	13.571
20U70	CONMOLLE	FF1059	IN	1	1	1		3	270	56.00	13.571
20U71	RATHEURNE	FF1059	IN	1	1	1		3	270	56.00	13.571
20U72	MEYERKORD	FF1059	IN	1	1	1		3	270	56.00	13.571
20U73	W.S. STUBBS	FF1059	IN	1	1	1		3	270	56.00	13.571
20U74	WHIPPLE	FF1062	IN	1	1	1		3	270	78.00	29.830
20U75	REASONER	FF1063	IN	1	1	1		3	270	62.00	17.741
20U76	LOCKWOOD	FF1064	IN	1	1	1		3	270	86.00	4.651
20U77	STEIN	FF1065	IN	1	1	1		3	270	73.00	10.958
20U78	MARVIN SHIELDS	FF1066	IN	1	1	1		3	270	74.00	10.270
20U79	HAMMOND	FF1067	IN	1	1	1		3	270	64.00	9.375
20U80	HAMMOND	FF1068	IN	1	1	1		3	270	53.00	13.207
20U81	BAGLEY	FF1069	IN	1	1	1		3	270	76.00	13.207
20U82	DOWNES	FF1071	IN	1	1	1		3	270	57.00	13.207
20U83	BADGER	FF1071	IN	1	1	1		3	270	57.00	13.207
20U84	PEARLY	FF1073	IN	1	1	1		3	270	57.00	13.207
20U85	H.E. HOLT	FF1074	IN	1	1	1		3	270	57.00	13.207
20U86	TRIPPE	FF1075	IN	1	1	1		3	270	64.00	4.687
20U87	FANNING	FF1079	IN	1	1	1		3	270	48.00	10.447
20U88	OUELLET	FF1077	IN	1	1	1		3	270	48.00	18.333
20U89	GARCIA	FF1040	IN	1	1	1		3	270	65.00	12.507
20U90	BROADLEY	FF1041	IN	1	1	1		3	270	64.00	12.507
20U91	MCDONNELL	FF1042	IN	1	1	1		3	270	60.00	14.660
20U92	GRUMBY	FF1044	IN	1	1	1		3	270	60.00	14.660
20U93	DAVIDSON	FF1045	IN	1	1	1		3	270	63.00	10.285
20U94	VOGEL	FF1047	IN	1	1	1		3	270	68.00	10.571
20U95	SAMPLER	FF1049	IN	1	1	1		3	270	57.00	8.771
20U96	KUELSCH	FF1049	IN	1	1	1		3	270	57.00	23.380
20U97	DAVID	FF1049	IN	1	1	1		3	270	57.00	23.380
20U98	FAHRIAN	FFG22	IN	1	1	1		3	270	42.00	14.754
20U99	WILLIAMS	FFG24	IN	1	1	1		3	195	42.00	14.754
21U00	COPELAND	FFG25	IN	1	1	1		3	195	45.00	24.444
21U01	GALLEY	FFG25	IN	1	1	1		3	195	51.00	17.647
21U02	MCILMEYER	FFG25	IN	1	1	1		3	195	56.00	23.214
21U03	TISDALE	FFG27	IN	1	1	1		3	195	50.00	16.660
21U04	BOONE	FFG28	IN	1	1	1		3	195	45.00	19.111
21U05	BOONE	FFG28	IN	1	1	1		3	195	56.00	12.507

ATTRITION RATE BY CAT/CLASS

UIC	SHIP NAME	HULL NO	CAT/CLASS	FY85	FY86	FY87	FY88	TOTAL	AVG CREW	< 3 rd SERVICE	LOSS RATE (%)
21054	GROVIS	9	1G		4	1		5	195	37.00	13.313
21055	REID	FFG20	1G		6	2		8	195	49.00	16.320
21056	STARK	FFG31	1G		1	0		10	195	41.00	24.390
21057	JARRITT	FFG32	1G	1	1	3	1	6	195	26.00	15.384
21058	FITCH	FFG33	1G	1	3	3		7	195	49.00	14.285
21059	WILSON	FFG34	1G	1	4	3	2	10	195	28.00	18.571
21101	UNDERWOOD	FFG39	1G	2	2	1		5	195	44.00	11.363
21102	CROPELLIN	FFG38	1G	1	1			2	195	44.00	11.363
21105	CURTIS	FFG38	1G	1	8			9	195	49.00	20.408
21106	DOYLE	FFG39	1G	1	1			2	195	39.00	22.564
21107	HALYBURTON	FFG40	1G	3	2	1		6	195	46.00	13.043
21108	MCCLELLAN	FFG41	1G	4	3	1		8	195	50.00	11.999
21109	KLAFFING	FFG42	1G	4	5	3		12	195	19.999	19.999
21110	THATCHER	FFG43	1G	1	4	2		7	195	50.00	19.999
21197	HEWITT	FFG45	1G	1	1	2		4	195	36.00	8.333
21198	RENTZ	FFG47	1G	1	5	1		7	195	23.00	23.076
21199	NICHOLAS	FFG42	1G	2	2	4		8	195	17.00	17.067
21200	VANDERGRIFT	FFG48	1G		1	1		2	195	36.00	17.067
21201	BRAUBER	FFG49	1G	2	1	1	2	6	195	26.00	17.067
21231	TAYLOR	FFG50	1G	5	3	2		10	195	29.00	31.054
21232	GARY	FFG51	1G	2	5	3		10	195	83.00	31.054
21233	HAME	FFG52	1G	2	5	3		10	195	77.00	31.054
21234	FORDE	FFG53	1G	1	5	4		10	195	95.00	31.054
21235	ELRICH	FFG54	1G	1	5	3		9	195	96.00	31.054
21236	SIMPSON	FFG55	1G	1	5	3		9	195	96.00	31.054
07170	RALEIGH	FFG56	1G	1	1	1		3	195	88.00	17.274
07171	VANCOUVER	FFG57	1G	5	3	2		10	195	124.00	12.006
07172	AUSTIN	FFG58	1G	8	3	2		13	400	118.00	12.006
07173	OGDEN	FFG59	1G	11	8	0		19	400	118.00	12.006
07174	DULUTH	FFG60	1G	10	10	4	1	25	400	120.00	15.178
07175	CLEVELAND	FFG61	1G	10	9	3		22	400	18.388	18.388
07176	DURBOE	FFG62	1G	10	10	3		23	400	24.091	24.091
07177	DENVILLE	FFG63	1G	10	9	3	1	23	400	24.091	24.091
07178	JUNEAU	FFG64	1G	10	9	3		22	400	15.107	15.107
07179	SHREVEPORT	FFG65	1G	10	9	3		22	400	17.021	17.021
07180	NASHVILLE	FFG66	1G	10	9	3		22	400	10.190	10.190
07181	TRENTON	FFG67	1G	10	9	3		22	400	10.190	10.190
07182	PONCA	FFG68	1G	10	9	3		22	400	10.190	10.190
07183	CHARLESTON	FFG69	1G	10	9	3		22	400	10.190	10.190
07184	DURHAM	FFG70	1G	10	9	3		22	400	10.190	10.190
07185	MOBILE	FFG71	1G	10	9	3		22	400	10.190	10.190
07186	SAINT LOUIS	FFG72	1G	10	9	3		22	400	10.190	10.190
07187	EL PASO	FFG73	1G	10	9	3		22	400	10.190	10.190
07188	SPIEGEL GROVE	FFG74	1G	10	9	3		22	400	10.190	10.190
07189	ALAMO	FFG75	1G	10	9	3		22	400	10.190	10.190
07190	HERMITAGE	FFG76	1G	10	9	3		22	400	10.190	10.190
07191	ANCHORAGE	FFG77	1G	10	9	3		22	400	10.190	10.190
07192	PENSACOLA	FFG78	1G	10	9	3		22	400	10.190	10.190
07193	PORTLAND	FFG79	1G	10	9	3		22	400	10.190	10.190
07194	MOUNT VERNON	FFG80	1G	10	9	3		22	400	10.190	10.190
07195	FORT FISHER	FFG81	1G	10	9	3		22	400	10.190	10.190
07196	WHI OBELY ISLAND	FFG82	1G	10	9	3		22	400	10.190	10.190

ATTRITION RATE BY CAT/CLASS

UIC	SHIP NAME	HULL NO	CAT/CLASS	FY85	FY86	FY87	FY88	TOTAL	AVG CREW	< 34 MO SERVICE	LOSS RATE (%)
05850	MILWAUKEE	A092	TH	2	12	9	1	24	442	116.00	18.103
07122	KANSAS CITY	A093	TH	7	20	5		34	442	130.00	26.153
07123	SAVANNAH	A094	TH	1	16	5		22	442	177.00	30.919
20124	WABASH	A095	TH	1	27	8	2	38	442	129.00	29.457
20125	KALAMAZOO	A096	TH	1	8	4	1	14	442	196.00	14.583
20243	ROAMING	A097	TH	1	7	5		12	442	107.00	12.169
07963	CONSTANT	M30427	4A	1	2	1		4	56	14.00	28.000
07963	ENGAGE	M30433	4A	1	1	1		3	56	9.00	33.333
07968	ENHANCE	M30437	4A	1	1			2	56	9.00	33.333
07968	ESTERH	M30438	4A	1	1			2	56	9.00	33.333
07968	EXCEL	M30439	4A	1	1	1		3	56	13.00	17.602
07970	EXPLOIT	M30440	4A	1	1	1		3	56	10.00	19.979
07971	EXULTANT	M30441	4A	1	1	1		3	56	13.00	23.076
07972	FEARLESS	M30442	4A	2	1	1		4	56	12.00	25.000
07979	FERTILITY	M30449	4A	1				1	56	9.00	16.285
07985	IMPERVIOUS	M30455	4A	1	1			2	56	9.00	16.285
07985	IMPLICIT	M30456	4A	1	1			2	56	9.00	16.285
07986	INFLECT	M30464	4A	1	1	1		3	56	13.00	15.384
07994	PLUCK	M30466	4A	1	1			2	56	13.00	15.384
08149	CONQUEST	M30488	4A	1	1	1	1	5	56	19.00	27.000
08149	GALLANT	M30489	4A	1	1	1		4	56	19.00	27.000
08150	PLEDGE	M30492	4A	1	1	1		4	56	11.00	19.979
08157	ADROIT	M30509	4A	1	1	1		4	56	11.00	19.979
08159	AFFRAY	M30511	4A	1	1	1		4	56	11.00	19.979
04638	PRAIRIE	AD15	5A	2	5	3		10	827	110.00	23.076
06039	YOSEMITE	AD19	5A	5	6	5	3	23	827	198.00	10.204
06039	COMBERS	AD37	5B	1	9	5		15	827	183.00	14.118
06037	SAMUEL	AD38	5B	1	12	5		18	827	183.00	14.118
21040	PUGET SOUND	AD41	5C	1	26	13	1	41	176.00	176.00	11.959
21047	YELLOWSTONE	AD42	5C	2	19	3		24	176.00	176.00	11.959
21063	ACADIA	AD43	5C	3	12	3	1	21	176.00	176.00	11.959
08808	CAPE COD	AD43	5C	3	12	3	1	21	176.00	176.00	11.959
08808	AJAX	AD46	5D	1	8	1	1	11	847	116.00	18.888
08808	VULCAN	AD46	5D	1	8	1	1	11	847	116.00	18.888
08810	JASCH	AD48	5D	2	3	2		7	847	144.00	12.500
TOTAL			300	612	1,771	937	87	3,407	343.0	24,062.00	14.159

APPENDIX C
LOSS RATES BY SHIP CLASS

ATTRITION RATE BY SHIPS CLASS

NO SHIPS IN CLASS	CAT/CLASS	FY77	FY78	FY79	FY80	TOTAL	AVG CREW SIZE	AVG MU SERVICE	AVG LOSS RATE (X)
003	1A	11	24	11	3	49	539	382.00	12.82
004	1B	17	35	16	3	66	579	392.00	15.54
001	1C	27	15	5		23	569	148.00	13.87
008	1E	0	25	13	6	44	530	202.00	13.87
009	1G	50	79	48		191	447	310.00	15.79
010	1H	61	129	103	10	241	378	247.00	16.31
028	1J	138	254	277	15	510	330	167.00	18.91
006	1K	33	52	37	2	115	310	85.00	19.69
009	1M	177	252	142	35	579	542	542.00	19.34
013	1N	143	269	177	26	476	857	857.00	21.34
005	2A	128	204	107	27	410	339	237.00	21.22
005	2B	18	21	13	3	33	331	225.00	24.89
002	2C	109	211	131	27	482	271	290.00	23.51
002	2E	11	19	20	2	34	240	240.00	23.89
007	2F	15	36	10	2	54	330	240.00	23.89
002	2H	55	38	30	6	103	381	364.00	23.89
002	2J	55	110	47	13	122	381	364.00	23.89
007	2L	28	57	17	12	80	358	303.00	23.89
018	3A	80	114	57	3	180	442	368.00	23.89
002	3B	2	27	5	3	20	50	193.00	20.50
013	3A	48	77	33	6	163	927	903.00	18.03
002	3C	2	77	33	3	144	707	707.00	20.39
003	3D	36	77	49	8	171	786	786.00	21.73
227	TOTALS	1,429	2,411	1,196	238	5,274	453	27,701.00	19.039

ATTRITION RATE BY SHIPS CLASS

NO SHIPS IN CLASS	CAT/CLASS	FY81	FY82	FY83	FY84	TOTAL	AVG CME SIZE	AVG LOSS RATE (%)	< 34 MO SERVICE
004	A	14	29	25	5	6	539	13.41	492.00
000	B	7	5	10	1	18	280.00	17.29	280.00
001	D	5	17	3	1	23	153.00	17.94	153.00
009	E	4	3	13	1	20	194.00	22.16	194.00
004	H	3	15	5	1	24	111.00	18.89	111.00
010	I	20	38	33	8	99	109.00	19.25	109.00
030	J	9	18	17	16	41	204.00	17.83	204.00
008	K	20	35	11	3	53	244.00	22.94	244.00
008	L	7	24	15	2	34	459.00	17.68	459.00
009	M	7	8	30	9	34	959.00	10.13	959.00
005	N	2	3	10	1	16	606.00	17.93	606.00
005	P	2	1	2	20	24	221.00	22.47	221.00
005	A	10	10	22	5	47	319.00	22.21	319.00
005	B	3	1	17	2	22	277.00	22.50	277.00
005	C	0	1	3	4	8	227.00	22.50	227.00
002	F	0	1	0	1	2	501.00	21.91	501.00
002	G	1	1	2	5	9	459.00	20.42	459.00
003	A	5	1	13	4	20	190.00	25.92	190.00
002	B	1	2	5	4	12	249.00	23.24	249.00
002	C	1	1	3	5	10	190.00	25.92	190.00
002	D	1	2	1	4	8	249.00	18.52	249.00
002	E	1	1	1	1	4	949.00	23.24	949.00
002	F	1	1	1	1	4	238.00	21.55	238.00
002	G	1	1	1	1	4	308.00	21.55	308.00
004	H	3	4	6	1	14	291.00	25.94	291.00
008	A	2	1	0	1	4	873.00	17.20	873.00
003	B	5	6	10	1	22	285.00	17.54	285.00
003	C	1	0	3	5	9	775.00	16.37	775.00
003	D	1	0	3	2	6	637.00	11.61	637.00
263	TOTALS	779	2,237	1,491	250	4,757	25,739.00	17.258	

ATTRITION RATE BY SHIPS CLASS

NO SHIPS IN CLASS	CAT/CLASS	FY85	FY86	FY87	FY88	TOTAL	AVG CREW SIZE	< 34 MO SERVICE	AVG LOSS RATE (%)
004	1A	8	22	10	2	42	539	515.00	8.15
007	1BC	3	11	0	1	15	579	297.00	10.40
001	1D	3	11	0	1	15	529	158.00	13.40
001	1E	0	1	0	3	3	236	273.00	12.55
009	1F	2	5	0	5	15	340	245.00	15.49
004	1GH	2	5	0	1	8	467	93.00	14.80
010	1H	3	7	0	1	11	378	333.00	10.49
023	1JK	2	7	4	6	19	376	928.00	13.43
031	1LM	6	10	0	11	27	314	42.00	15.18
030	1N	8	13	0	9	30	270	248.00	12.75
009	1P	2	5	2	3	12	559	559.00	12.25
013	1QA	2	6	2	6	16	559	339.00	12.25
005	1B	3	6	2	2	13	559	339.00	12.25
005	1C	1	3	2	2	8	559	339.00	12.25
005	1D	1	3	1	1	6	559	339.00	12.25
005	1E	1	3	1	1	6	559	339.00	12.25
005	1F	1	3	1	1	6	559	339.00	12.25
005	1G	1	3	1	1	6	559	339.00	12.25
005	1H	1	3	1	1	6	559	339.00	12.25
005	1I	1	3	1	1	6	559	339.00	12.25
005	1J	1	3	1	1	6	559	339.00	12.25
005	1K	1	3	1	1	6	559	339.00	12.25
005	1L	1	3	1	1	6	559	339.00	12.25
005	1M	1	3	1	1	6	559	339.00	12.25
005	1N	1	3	1	1	6	559	339.00	12.25
005	1O	1	3	1	1	6	559	339.00	12.25
005	1P	1	3	1	1	6	559	339.00	12.25
005	1Q	1	3	1	1	6	559	339.00	12.25
005	1R	1	3	1	1	6	559	339.00	12.25
005	1S	1	3	1	1	6	559	339.00	12.25
005	1T	1	3	1	1	6	559	339.00	12.25
005	1U	1	3	1	1	6	559	339.00	12.25
005	1V	1	3	1	1	6	559	339.00	12.25
005	1W	1	3	1	1	6	559	339.00	12.25
005	1X	1	3	1	1	6	559	339.00	12.25
005	1Y	1	3	1	1	6	559	339.00	12.25
005	1Z	1	3	1	1	6	559	339.00	12.25
300	TOTALS	612	1,771	937	97	3,407	343	24,062.00	14.15%

APPENDIX D

LOSS RATES BY RATING (OCCUPATION)

LOSS BY RATING
SHIPS CATEGORY = 1

RATING	AVG NO ON BOARD	FY77	FY78	FY79	FYSU	TOTAL	LOSS RATE
AA	0	0	0	1	0	1	12.50
AA	3	0	0	0	0	0	13.33
AK	16	1	0	0	0	1	6.47
AKM	778	4	5	34	1	138	23.07
BT	0	0	0	0	0	0	17.00
CTT	29	0	0	0	0	0	0.89
DDS	554	0	0	0	0	0	4.34
EMT	150	0	0	0	0	0	7.62
ENT	2	0	0	0	0	0	7.33
EWA	218	0	0	0	0	0	1.03
EWA	422	0	0	0	0	0	1.88
FN	112	2	0	1	0	3	25.89
FN	16	0	0	0	0	0	34.41
FTG	559	0	0	0	0	0	4.14
FTG	427	0	0	0	0	0	0.22
GMT	304	0	0	0	0	0	13.07
GMT	1	0	0	0	0	0	13.07
HA	20	0	0	0	0	0	4.00
HA	3	0	0	0	0	0	4.00
HNK	20	0	0	0	0	0	2.24
HNK	3	0	0	0	0	0	2.00
HT	403	0	0	0	0	0	50.00
HT	1	0	0	0	0	0	17.86
IC	488	0	0	0	0	0	5.85
IC	9	0	0	0	0	0	11.11
JHM	29	0	0	0	0	0	12.95
JHM	3	0	0	0	0	0	16.98
KST	1	0	0	0	0	0	16.00
KST	1	0	0	0	0	0	11.84
OPC	802	0	0	0	0	0	14.03
OPC	4	0	0	0	0	0	13.33
PNM	75	0	0	0	0	0	13.04
PNM	16	0	0	0	0	0	18.75
RH	443	0	0	0	0	0	22.03
RH	1	0	0	0	0	0	13.39
SAH	2209	0	0	0	0	0	11.21
SAH	223	0	0	0	0	0	18.75
SKM	587	0	0	0	0	0	22.49
SKM	2	0	0	0	0	0	14.00
SN	1709	0	0	0	0	0	6.75
SKG	1	0	0	0	0	0	20.95
SKG	74	0	0	0	0	0	5.67
STH	102	0	0	0	0	0	10.67
STH	456	0	0	0	0	0	10.67
TNK	13	0	0	0	0	0	10.67
TNK	13	0	0	0	0	0	10.67
TOTALS	131970	647	1700	317	86	2330	10.67

LOSS BY RATING
SHIPS CATEGORY = 2

RATING	AVG ON BOARD	FY77	FY78	FY79	FY80	TOTAL	LOSS RATE
AA	64.00	7	5	3	0	15	23.43
ABF	15.00	1	0	1	0	1	6.66
ABH	13.00	1	0	0	0	1	7.00
AO	10.00	1	0	0	0	1	10.00
AG	12.00	1	1	1	3	6	25.00
AN	92.00	0	1	5	0	6	33.00
ARSE	5.00	0	1	0	0	1	31.50
ASM	2.00	0	0	2	0	2	10.00
BM	160.00	0	1	1	2	4	19.25
BK	13.00	0	0	1	0	1	24.37
DD	14.00	0	0	0	0	0	7.00
DR	1.00	0	0	0	0	0	100.00
DS	5.00	0	0	0	0	0	5.00
DT	2.00	0	0	0	0	0	2.00
DEW	14.00	2	1	2	1	6	9.39
ET	214.00	5	1	1	1	8	12.61
EWA	33.00	0	0	0	0	0	0.00
FN	318.00	18	4	15	3	36	9.09
FR	350.00	38	5	28	4	75	17.44
FTG	24.00	0	0	0	0	0	0.00
FTMG	10.00	0	0	0	0	0	0.00
GMM	9.00	0	0	0	0	0	0.00
HM	21.00	0	0	0	0	0	0.00
HN	20.00	0	0	0	0	0	0.00
HK	23.00	0	0	0	0	0	0.00
HT	207.00	1	1	4	2	8	19.99
HTC	57.00	0	0	0	0	0	0.00
IJS	47.00	0	0	0	0	0	0.00
JL	133.00	1	0	1	0	2	33.33
MR	225.00	1	0	0	0	1	12.50
MS	160.00	1	1	1	0	3	12.28
MSP	13.00	0	0	0	0	0	0.00
PH	34.00	0	0	0	0	0	0.00
PN	29.00	0	0	0	0	0	0.00
PM	249.00	0	1	3	3	6	17.50
SA	82.00	0	1	5	0	6	24.99
SK	62.00	0	0	0	0	0	0.00
SM	69.00	1	0	0	0	1	69.00
SKM	138.00	1	0	0	0	1	138.00
SKW	1.00	0	0	0	0	0	0.00
Y	4.00	0	0	0	0	0	0.00

LOSS BY RATING
SHIPS CATEGORY = 2

RATING	AVG NO ON BOARD	FY77	FY78	FY79	FY80	TOTAL	LOSS RATE
UNK	109.0	0	5	1	0	6	5.50
TOTALS	5,990	358	575	304	70	1,308	21.83

LOSS BY RATING
SHIPS CATEGORY = 3

RATING	NO ON BOARD	FY77	FY78	FY79	FY80	TOTAL	LOSS RATE
AA	2	0	0	1	0	1	50.00
AK	2	0	0	0	0	0	.00
AK	17	0	0	3	1	4	5.88
AK	25	0	14	1	0	15	17.22
AK	186	0	12	3	0	15	23.52
BT	17	0	4	2	0	6	21.41
DK	14	0	0	0	0	0	0.00
DP	107	0	0	2	0	2	14.28
EM	142	0	0	0	0	0	.00
EM	240	0	35	12	2	49	28.74
EM	69	0	38	8	3	49	31.81
EM	271	0	38	19	0	57	9.09
EM	11	0	1	0	0	1	7.14
EM	14	0	1	0	0	1	22.22
EM	81	0	1	0	0	1	.33
EM	3	0	1	0	0	1	8.00
EM	12	0	0	0	0	0	.00
EM	8	0	0	0	0	0	.33
EM	12	0	0	0	0	0	.33
EM	102	0	4	3	1	8	11.76
EM	155	0	0	0	0	0	.00
EM	231	0	0	0	0	0	.00
EM	14	0	0	0	0	0	.00
EM	9	0	0	0	0	0	.00
EM	6	0	0	0	0	0	.00
EM	2	0	0	0	0	0	.00
EM	72	0	15	0	0	15	15.58
EM	72	0	10	0	0	10	11.76
EM	17	0	0	0	0	0	.00
EM	34	0	0	0	0	0	.00
EM	102	0	12	5	1	17	16.19
EM	94	0	0	0	0	0	.00
EM	22	0	0	0	0	0	.00
EM	172	0	13	0	0	13	15.11
EM	62	0	4	0	0	4	10.12
EM	383	0	13	0	0	13	24.04
EM	339	0	0	0	0	0	.00
EM	1	0	0	0	0	0	.00
EM	2	0	0	0	0	0	.00
EM	72	0	1	0	0	1	19.99
EM	4	0	1	0	0	1	6.94
EM	72	0	0	0	0	0	.00
TOTALS	4,938	305	497	239	57	1,098	22.23

LOSS BY RATING
SHIPS CATEGORY = 4

RATING	AVG NO ON BOARD	FY77	FY78	FY79	FY80	TOTAL	LOSS RATE
AR	0.0	0	0	1	0	1	11.00
EM	18.0	0	1	0	0	1	17.00
EN	23.0	0	2	0	0	2	28.57
FA	21.0	0	0	2	1	3	33.33
FN	6.0	1	0	1	0	2	50.00
FR	1.0	0	0	0	0	0	44.00
GMG	9.0	0	1	0	0	1	0.00
HT	4.0	0	0	0	0	0	12.50
IC	16.0	1	1	0	0	2	16.66
MS	5.0	0	0	0	0	0	0.00
OS	9.0	0	0	0	0	0	13.28
PN	7.0	0	1	0	0	1	13.33
RM	15.0	0	0	0	0	0	40.00
SA	5.0	0	0	0	0	0	11.11
SN	22.0	2	6	0	0	8	19.68
SR	27.0	1	2	0	0	3	
UNK	193	5	22	8	3	38	
TOTALS							

LUSS BY RATING
SHIPS CATEGORY = 5

RATING	AVG NO ON BOARD	FY77	FY78	FY79	FY80	TOTAL	LOSS RATE
AK	9.0	1	0	0	0	1	16.00
BT	82.0	2	0	0	0	2	15.00
DK	10.0	0	0	0	0	0	.00
DN	21.0	0	0	0	0	0	4.76
DR	10.0	0	0	0	0	0	.00
DT	41.0	1	1	1	1	4	9.75
EM	198.0	12	3	12	7	34	17.94
EN	165.0	2	3	2	1	8	32.32
FA	277.0	2	3	2	1	8	24.61
FN	33.0	1	0	0	0	1	30.32
FTG	1.0	0	1	0	0	1	7.69
GMG	4.0	0	0	0	0	0	.00
GMT	4.0	0	0	0	0	0	.00
HAM	1.0	0	0	0	0	0	25.00
HNR	1.0	0	0	0	0	0	33.33
HRT	2.0	0	0	0	0	0	10.44
HIC	24.0	2	1	0	0	3	8.82
IC	17.0	0	0	0	0	0	5.00
JO	1.0	2	0	0	0	2	19.99
JL	5.0	0	0	0	0	0	17.09
LM	20.0	1	0	0	0	1	10.76
MM	1.0	0	0	0	0	0	18.79
MKS	28.0	1	6	1	0	8	14.28
MOS	1.0	0	0	0	0	0	16.00
OCS	8.0	0	0	0	0	0	12.50
PC	10.0	0	0	0	0	0	9.99
PH	12.0	0	0	0	0	0	.00
PN	3.0	0	0	0	0	0	.00
PMT	20.0	1	0	0	0	1	5.55
RA	22.0	1	0	0	0	1	27.03
SAH	6.0	2	0	1	0	3	8.33
SK	3.0	0	0	0	0	0	9.52
SM	10.0	3	0	1	0	4	23.30
SNK	17.0	5	0	0	0	5	29.09
SKG	15.0	0	1	0	0	1	13.33
STG	18.0	1	1	0	0	2	6.25
TM	9.0	0	0	0	0	0	27.77
YNK	3.0	0	0	0	0	0	1.07
TOTALS	2,604	114	236	128	22	500	19.20

LOSS BY RATING
SHIPS CATEGORY = 1

RATING	AVG NO ON BOARD	FY81	FY82	FY83	FY84	TOTAL	LOSS RATE
AA	2.0	0	1	0	0	1	50.00
AN	4.0	1	0	0	0	1	25.00
AR	13.0	1	0	0	0	1	7.69
AT	1.0	0	0	0	0	0	.00
AZ	32.0	0	5	15	0	23	71.87
BT	82.0	2	6	51	0	144	17.41
BU	4.0	0	1	0	0	1	50.00
CE	2.0	0	0	0	0	0	.00
CTI	1.0	0	0	0	0	0	.00
CIR	9.0	0	1	0	0	1	16.66
CIT	1.0	0	0	0	0	0	.00
CK	1.0	0	0	0	0	0	.00
DKS	4.0	2	0	0	0	2	7.31
DEMT	33.0	0	0	0	0	0	3.03
EET	34.0	0	0	0	0	0	9.05
EWA	151.0	3	0	0	0	3	13.83
FAM	9.0	0	0	0	0	0	5.94
FMR	178.0	2	0	0	0	2	19.03
FTB	0	3	0	0	0	3	22.47
FIG	2.0	0	0	0	0	0	5.12
FMG	27.0	0	0	0	0	0	3.81
GMT	29.0	0	0	0	0	0	10.92
GSEH	66.0	0	0	0	0	0	19.27
GSA	17.0	0	0	0	0	0	10.05
HHR	4.0	0	0	0	0	0	50.00
HRT	3.0	0	0	0	0	0	9.99
HJG	386.0	0	0	0	0	0	100.00
JMK	153.0	0	0	0	0	0	9.84
JMS	224.0	0	0	0	0	0	4.57
KMS	46.0	0	0	0	0	0	3.93
MT	4.0	0	0	0	0	0	25.06
MD	109.0	0	0	0	0	0	25.00
PCN	81.0	0	0	0	0	0	12.80
PR	1.0	0	0	0	0	0	9.55
PRM	168.0	0	0	0	0	0	11.76
RMP	42.0	0	0	0	0	0	11.90
RPA	23.0	0	0	0	0	0	9.09
SA	135.0	0	0	0	0	0	23.76
SH	106.0	0	0	0	0	0	24.36
SS	19.0	0	0	0	0	0	19.09

LOSS BY RATING
SHIPS CATEGORY = 1

RATING	AVG NO ON BOARD	FY81	FY82	FY83	FY84	TOTAL	LOSS RATE
SN	574.0	23	41	50	4	118	20.55
SR	1,714.0	116	245	144	36	541	31.56
STG	1,581.0	14	35	34	3	86	14.80
STM	89.0	0	0	0	0	0	18.35
YMK	160.0	1	5	4	2	12	17.69
UNK	26.0	1	0	0	0	1	17.84
TOTALS	13,784	490	1,094	759	117	2,460	

LOSS BY RATING
SHIPS CATEGORY = 2

RATING	AVG NO ON BOARD	FY81	FY82	FY83	FY84	TOTAL	LOSS RATE
AA	17.0	1	0	1	0	4	23.52
ABF	13.0	0	0	0	0	0	.00
ABH	17.0	0	0	0	0	0	.00
AG	10.0	0	0	1	0	1	.00
AMS	9.0	0	0	1	0	1	11.11
AN	38.0	2	0	0	0	2	28.94
AR	3.0	1	0	0	0	1	33.33
ASE	8.0	0	0	0	0	0	12.50
ASH	25.0	0	0	1	0	1	19.99
ASMT	109.0	0	1	14	0	15	26.60
BT	1.0	0	0	0	0	0	.00
CCR	17.0	0	0	0	0	0	.00
CDM	1.0	0	0	0	0	0	.00
CDN	29.0	0	0	0	0	0	.00
DPR	13.0	0	0	0	0	0	.00
DPRS	107.0	3	2	1	0	6	17.44
DEMN	262.0	3	16	11	0	30	7.47
DEMT	34.0	0	2	1	0	3	13.75
EW	408.0	1	3	1	0	5	8.62
EWFA	473.0	1	6	18	0	25	17.15
FN	4	2	1	4	0	7	42.46
FKB	7.0	1	5	4	1	11	31.71
FTM	28.0	1	0	0	0	1	100.00
FTMG	1.0	0	0	0	0	0	.00
GMM	21.0	0	1	0	0	1	14.28
GHA	21.0	0	1	0	0	1	17.85
HM	2.0	1	1	0	0	2	100.00
HNR	2.0	1	1	0	0	2	53.33
HRT	129.0	1	1	1	0	3	9.52
HTC	3.0	0	1	0	0	1	14.28
ICS	12.0	0	1	0	0	1	100.00
JCI	350.0	1	0	0	0	1	18.78
JMI	212.0	0	0	0	0	0	.00
JMS	2.0	1	0	0	0	1	19.99
MKS	14.0	0	0	0	0	0	.00
MOS	18.0	0	0	0	0	0	.00
PCH	4.0	1	0	0	0	1	18.57
PHN	6.0	0	0	0	0	0	.00
PM	4.0	0	0	0	0	0	.00
QMP	18.0	0	0	0	0	0	.00
RPA	5.0	0	0	0	0	0	.00
SA	33.0	0	0	0	0	0	.00
SH	9.0	0	0	0	0	0	.00
SK	2.0	0	0	0	0	0	.00
SM	4.0	1	1	0	0	2	9.51
SN	11.0	0	0	0	0	0	.00
							11.11
							13.51
							33.33
							20.85
							14.91
							17.70
							19.99

LOSS BY RATING
SHIPS CATEGORY = 2

RATING	AVG NO ON BOARD	FY81	FY82	FY83	FY84	TOTAL	LOSS RATE
SR	705.0	01	116	63	18	258	39.59
STS	3.0	0	1	0	0	1	33.33
TM	2.0	0	1	0	0	1	50.00
YN	82.0	1	3	2	0	11	13.41
UNK	3.0	0	0	0	0	0	22.00
TOTALS	4,828	212	489	308	55	1,064	

LOSS BY RATING
SHIPS CATEGORY = 3

RATING	AVG NO ON BOARD	FY81	FY82	FY83	FY84	TOTAL	LOSS RATE
AA	2.0	0	0	0	0	0	25.00
AK	4.0	0	0	0	0	0	25.00
AMS	1.0	0	0	0	0	0	25.00
AN	3.0	0	0	0	0	0	25.00
ARM	2.0	0	0	0	0	0	18.18
BT	12.0	0	1	0	0	1	20.16
CM	1.0	0	0	0	0	0	25.00
CRK	14.0	0	0	0	0	0	25.00
DK	3.0	0	0	0	0	0	6.45
DP	1.0	0	0	0	0	0	25.00
DST	1.0	0	0	0	0	0	9.36
DT	11.0	0	0	0	0	0	25.00
EM	50.0	0	0	0	0	0	25.00
ENT	42.0	0	0	0	0	0	25.00
EWA	25.0	0	0	0	0	0	15.59
FN	66.0	0	1	0	0	1	21.21
FRTG	32.0	0	4	0	0	4	30.24
FTM	18.0	0	1	0	0	1	14.28
GMM	43.0	0	0	0	0	0	25.00
HA	5.0	0	0	0	0	0	39.99
HN	1.0	0	0	0	0	0	25.00
HNK	1.0	0	0	0	0	0	16.66
HT	1.0	0	0	0	0	0	16.10
IC	13.0	0	0	0	0	0	12.77
JO	0.0	0	0	0	0	0	17.61
JMM	31.0	0	0	0	0	0	9.09
KSS	11.0	0	0	0	0	0	37.76
OS	14.0	0	0	0	0	0	18.42
PC	11.0	0	0	0	0	0	3.33
POM	30.0	0	0	0	0	0	8.73
POMR	40.0	0	0	0	0	0	25.00
RRP	10.0	0	0	0	0	0	22.11
SA	0.0	0	0	0	0	0	16.66
SAH	51.0	0	0	0	0	0	13.33
SK	8.0	0	0	0	0	0	13.31
SKM	6.0	0	0	0	0	0	19.00
SN	26.0	0	0	0	0	0	33.60
SKS	2.0	0	0	0	0	0	25.00
STS	1.0	0	0	0	0	0	25.00
STM	1.0	0	0	0	0	0	25.00
YNK	3.0	0	0	0	0	0	25.00
TOTALS	4,162	101	429	253	57	925	14.22

LOSS BY RATING
SHIPS CATEGORY = 4

RATING	AVG NO ON BOARD	FY81	FY82	FY83	FY84	TOTAL	LOSS RATE
PH	3	0	0	1	0	1	33.33
PE	14	0	1	1	0	2	5.12
PF	37	0	1	2	1	4	17.64
PG	17	0	0	1	0	1	11.11
PH	7	0	1	1	0	2	28.57
PI	9	0	1	1	0	2	16.00
PM	10	0	1	0	0	1	10.00
PN	11	2	0	0	0	2	9.36
PO	11	0	0	0	0	0	36.00
PP	13	0	0	1	0	1	100.00
PQ	1	0	0	0	0	0	11.11
PR	23	0	1	2	0	3	21.00
PS	1	0	0	0	0	0	0.00
PT	13	0	0	0	0	0	0.00
PU	26	0	4	1	0	5	45.53
PV	1	0	1	2	0	3	11.66
PW	1	0	0	0	0	0	0.00
PX	1	0	0	0	0	0	0.00
PY	1	0	0	0	0	0	0.00
PZ	21	0	0	0	1	1	17.20
TOTALS	215	18	18	10	1	37	

LOSS BY RATING
SHIPS CATEGORY = 5

RATING	AVG NO ON BOARD	FY81	FY82	FY83	FY84	TOTAL	LOSS RATE
AA	2	0	0	0	0	0	.00
AN	1	0	0	0	0	0	100.00
AR	1	0	0	0	0	0	22.22
AT	1	0	0	2	0	1	17.85
BA	8	0	0	2	0	2	25.07
BT	59	1	0	2	0	3	.00
BK	1	0	0	0	0	0	.00
DM	9	0	0	0	0	0	13.20
DP	53	0	0	0	0	0	.00
DS	8	0	0	0	0	0	6.81
DE	81	0	0	0	0	0	13.58
ENT	21	0	0	2	0	1	4.87
ET	309	4	1	20	0	4	13.26
FA	60	1	0	0	0	1	16.66
FN	324	1	0	2	0	3	27.16
FR	5	0	0	0	0	0	.00
FTG	1	0	0	0	0	0	.00
GMT	14	0	0	0	0	0	.00
GSM	1	0	0	0	0	0	100.00
HM	1	0	0	0	0	0	22.22
HN	19	0	0	0	0	0	12.26
HR	0	0	0	0	0	0	.00
HT	326	0	0	18	0	4	7.14
HC	27	0	0	0	0	0	.00
IC	1	0	0	0	0	0	.00
IM	14	0	0	0	0	0	.00
JO	2	0	0	0	0	0	33.33
LI	3	0	0	0	0	0	13.88
LM	2	0	0	0	0	0	9.97
ML	239	5	1	1	0	3	23.33
MM	80	6	4	3	0	14	19.04
MR	2	0	0	0	0	0	19.99
MS	21	0	0	0	0	0	.00
OM	7	0	0	0	0	0	14.28
OS	1	0	0	0	0	0	11.11
PC	14	0	0	0	0	0	8.57
PH	18	0	0	0	0	0	13.00
PHM	3	0	0	0	0	0	19.09
PM	3	0	0	0	0	0	17.85
PMH	3	0	0	0	0	0	25.00
QMP	48	0	0	0	0	0	23.07
RPA	11	0	0	0	0	0	34.94
SHA	28	0	0	0	0	0	14.28
SK	9	0	0	0	0	0	19.99
SM	289	4	0	2	0	6	17.12
SN	9	0	0	0	0	0	.00
SR	2	0	0	0	0	0	.00
STG	2	0	0	0	0	0	.00
TH	35	0	0	0	0	0	.00
YNK	2	0	0	0	0	0	.00
UNK	6	0	0	0	0	0	.00
TOTALS	2,750	46	207	150	20	471	17.12

LOSS BY RATING
SHIPS CATEGORY = 1

RATING	AVG NO ON BOARD	FY85	FY86	FY87	FY88	TOTAL	LOSS RATE
STS	4.0	0	0	0	0	0	.00
TM	65.0	1	1	2	0	5	7.69
YN	31.0	4	5	0	0	15	11.45
UNK	25.0	0	0	0	0	0	.00
TOTALS	14,076	331	895	494	52	1,772	12.58

LOSS BY RATING
SHIPS CATEGORY = 2

RATING	AVG NO ON BOARD	FY85	FY86	FY87	FY88	TOTAL	LOSS RATE
YN	49.0	1	4	4	0	9	18.36
UNK	5.0	0	0	0	0	0	16.00
TOTALS	4,338	132	377	202	16	727	16.75

LOSS BY RATING
SHIPS CATEGORY = 3

RATING	AVG NO ON BOARD	FY85	FY86	FY87	FY88	TOTAL	LOSS RATE
AD	1	0	0	0	0	0	.00
AK	4	0	0	0	0	0	.00
AN	1	0	0	0	0	0	.00
AR	21	0	2	0	0	2	28.57
BT	9	0	0	0	0	0	12.12
CMT	1	0	0	0	0	0	.00
CIT	1	0	0	0	0	0	.00
DK	1	0	0	0	0	0	.00
DR	1	0	0	0	0	0	.00
DS	9	0	0	0	0	0	.00
EM	15	0	0	0	0	0	.00
ENT	4	0	0	0	0	0	.00
ET	2	0	0	0	0	0	.00
EWA	29	0	0	0	0	0	.00
FC	1	0	0	0	0	0	.00
FN	14	0	0	0	0	0	.00
FR	1	0	0	0	0	0	.00
FTG	56	0	0	0	0	0	.00
FTM	10	0	0	0	0	0	.00
GAM	2	0	0	0	0	0	.00
GMT	1	0	0	0	0	0	.00
HAM	2	0	0	0	0	0	.00
HM	3	0	0	0	0	0	.00
HN	3	0	0	0	0	0	.00
HT	35	0	0	0	0	0	.00
HTU	1	0	0	0	0	0	.00
IU	1	0	0	0	0	0	.00
JO	12	0	0	0	0	0	.00
LI	1	0	0	0	0	0	.00
LMK	1	0	0	0	0	0	.00
MS	18	0	0	0	0	0	.00
OS	8	0	0	0	0	0	.00
PC	21	0	0	0	0	0	.00
PM	4	0	0	0	0	0	.00
PMR	1	0	0	0	0	0	.00
RPA	1	0	0	0	0	0	.00
SA	0	0	0	0	0	0	.00
SK	1	0	0	0	0	0	.00
SM	18	0	0	0	0	0	.00
SMR	1	0	0	0	0	0	.00
TR	3	0	0	0	0	0	.00
TK	5	0	0	0	0	0	.00
YK	1	0	0	0	0	0	.00
UNK	5	0	0	0	0	0	.00
TOTALS	377	113	376	165	11	670	17.74

LOSS BY RATING
SHIPS CATEGORY = 4

RATING	AVG NO ON BOARD	FY85	FY86	FY87	FY88	TOTAL	LOSS RATE
BM	3.0	0	0	0	0	0	.00
EM	14.0	2	0	0	0	2	14.28
ENT	36.0	0	1	0	0	1	5.00
ET	2.0	0	1	0	0	1	25.00
FA	8.0	0	0	1	0	1	16.50
FN	8.0	0	0	0	1	1	19.09
FRT	11.0	0	1	2	0	3	300.00
HIC	1.0	0	0	0	0	0	9.09
ICS	11.0	0	1	0	0	1	.00
MS	1.0	0	0	0	0	0	.00
OMS	1.0	0	0	0	0	0	12.50
ORH	8.0	1	0	0	0	1	17.85
SA	28.0	1	0	0	0	1	11.00
SK	9.0	2	0	0	0	2	30.76
SKM	29.0	0	0	3	0	3	.00
STG	17.0	0	0	10	0	10	16.20
TOTALS	177	10	8	10	1	29	

LOSS BY RATING
SHIPS CATEGORY = 5

RATING	AVG NO ON BOARD	FY85	FY86	FY87	FY88	TOTAL	LOSS RATE
AN	1	0	0	1	0	1	00
AM	1	0	0	1	0	1	00
BT	12	0	0	0	0	0	12
BK	1	0	0	0	0	0	11
DM	4	0	0	0	0	0	00
DR	4	0	0	0	0	0	00
DS	9	0	0	0	0	0	00
EN	44	0	0	0	0	0	00
EA	48	0	1	2	0	3	09
EN	160	0	2	3	0	5	66
FK	1	0	0	1	0	1	18
GM	8	0	0	1	0	1	30
GG	7	0	0	0	0	0	00
HT	1	0	0	0	0	0	00
HM	4	0	0	0	0	0	00
HN	14	0	0	0	0	0	00
HT	229	0	1	0	0	1	28
IC	2	0	0	0	0	0	00
IM	2	0	0	0	0	0	00
JI	5	0	0	0	0	0	00
JL	13	0	0	0	0	0	00
JM	2	0	0	0	0	0	00
KS	1	0	0	0	0	0	00
MS	6	0	0	0	0	0	00
OM	1	0	0	0	0	0	00
OS	5	0	0	0	0	0	00
SC	1	0	0	0	0	0	00
PH	1	0	0	0	0	0	00
PM	5	0	0	0	0	0	00
SA	19	0	0	0	0	0	00
SH	105	0	0	0	0	0	00
SK	6	0	0	0	0	0	00
SM	7	0	0	0	0	0	00
SN	8	0	0	0	0	0	00
SK	8	0	0	0	0	0	00
SG	11	0	0	0	0	0	00
SM	13	0	0	0	0	0	00
TM	2	0	0	0	0	0	00
YK	5	0	0	0	0	0	00
TOTALS	1,094	21	115	60	7	209	12.33

APPENDIX E
LOSSES BY REASONS

ATTRITION RATE BY REASON

SHIPS CATEGORY = 1

REASONS FOR LOSS	NUMBER OF LOSSES				FY8U	TOTAL
	FY77	FY78	FY79	FY80		
011	0	47	31	1	80	
013	7	21	15	1	44	
016	25	35	9	1	67	
022	10	27	13		55	
060	149	128	48	4	329	
061	118	73	33	6	235	
063	3	4	13		20	
064	124	304	172	13	613	
065	1		22		23	
066	11	57		1	71	
068	1				1	
069	1				1	
070	5	1	16	2	24	
071	2	12	19		33	
073	2	4	1		7	
074	2	6	1		9	
075	1	40	13		54	
077	32	41			73	
078	25	95	32	23	175	
080	1	4	2	1	8	
082	31	71	28	2	132	
089	50	62	49	1	162	
091	9	20	22	1	52	
093	1	1			2	
095	1	4	2		7	
098	1	1	1		3	
099	15	36	10	2	63	
TOTALS	647	1,060	517	66	2,330	

ATTRITION RATE BY REASON

SHIPS CATEGORY = 2

REASONS FOR LOSS	NUMBER OF LOSSES				TOTAL
	FY77	FY78	FY79	FY80	
011	7	17	17	2	43
013	0	1	4	1	6
016	0	7	1	0	8
022	0	7	1	0	8
031	0	1	0	0	1
032	4	12	5	4	25
034	8	57	15	5	85
061	7	01	17	5	30
063	1	0	0	0	1
064	1	3	10	0	14
065	7	192	128	14	407
069	0	0	0	0	0
067	11	36	12	1	60
068	0	1	0	0	1
071	1	4	5	20	30
073	0	3	12	0	15
074	5	5	2	4	16
075	0	0	0	0	0
077	14	10	3	0	27
079	12	45	1	16	74
078	0	7	22	1	30
080	10	34	20	1	65
082	23	37	11	1	72
086	2	14	5	1	22
091	1	1	1	0	3
095	0	0	0	0	0
096	0	1	1	0	2
098	10	11	8	0	29
099	0	0	0	0	0
TOTALS	353	576	504	70	1,308

ATTRITION RATE BY REASON

SHIPS CATEGORY = 3

REASONS FOR LOSS	NUMBER OF LOSSES				TOTAL
	FY77	FY78	FY79	FY80	
011	0	17	11	1	35
013	3	10	10	1	40
012	5	6	2		13
031		3			3
032	4	1	0		5
060	63	91	27	4	155
063	89	58	5		149
064	2	2	1		5
065	41	142	82	11	276
067	2	25	10	2	46
071	2	4	1	3	10
073	5	2	12	9	29
074		4	1		5
075		16	6		21
076	9	1	1		11
077	19	49	19	21	105
078	10	3	23	1	43
080	14	35	5	2	73
082	22	21	5	1	52
089	1	18	1		25
091		1	1		2
095		2			2
098	7	13	8	1	32
099					
TOTALS	305	497	239	57	1,098

ATTRITION RATE BY REASON

SHIPS CATEGORY = 4

REASONS FOR LOSS	NUMBER OF LOSSES				TOTAL
	FY77	FY78	FY79	FY80	
U11	1				1
U16		1			1
U32		4			4
U60	4		1		5
U61		2	3		5
U65		2			2
U67		1			1
U71				1	1
U73		1			1
U76		2		1	3
U78		2	1	2	5
U82			1		1
U86			1		1
U91			1		1
U99		1			1
TOTALS	5	22	8	3	38

ATTRITION RATE BY REASON

SHIPS CATEGORY = 5

REASONS FOR LOSS	NUMBER OF LOSSES				TOTAL
	FY77	FY78	FY79	FY80	
U11	1	0	4		15
U13	4	6	5		15
U16	1	4	1		6
U22	2	3	2		7
U32	20	29	17	1	59
U61	10	13	2		25
U64	25	35	5	5	65
U65	5	14	5		24
U67	1	1	3		5
U68	1	6	8	7	17
U73	4	2			6
U74	5	3	2		10
U76	5	19	10	8	42
U78			1		1
U80	11	11	8		30
U82	14	16	5		35
U86	1	17	3	1	22
U91	4	2	1		7
U95			2		2
U99					
TOTALS	114	256	128	22	500

ATTRITION RATE BY REASON

SHIPS CATEGORY = 1

REASONS FOR LOSS	NUMBER OF LOSSES				FY84	TOTAL
	FY81	FY82	FY83	FY84		
011	3	16	20	1	1	40
013	5	12	10	2	2	29
022	4	15	2	4	1	16
033	12	8	7	1	1	31
060	43	64	1	1	1	117
063	4	18	5	9	1	27
064	1	12	8	3	3	23
065	75	233	202	21	21	529
067	12	113	171	23	23	319
070	1	1	1	1	1	4
071	1	6	8	1	1	16
073	3	8	7	2	2	20
074	9	7	85	4	4	115
078	45	33	26	1	1	115
079	7	20	18	3	3	48
082	85	82	45	2	2	214
083	120	320	335	9	9	784
084	1	5	39	2	2	47
091	1	2	1	1	1	5
095	1	1	1	1	1	4
099	32	42	22	5	5	101
101	22	16	22	5	5	65
TOTALS	490	1,074	759	117	117	2,460

ATTRITION RATE BY REASON
SHIPS CATEGORY = 2

REASONS FOR LOSS	NUMBER OF LOSSES					TOTAL
	FY81	FY82	FY83	FY84		
U11	2	5	2			9
U15		1	2			3
U21	1	4	1			6
U32		1	5			6
U39	0	7	3			10
U61	13	29	3			45
U64	1	8	1			10
U65	4	6	2			12
U67	2	14	7			23
U71	1	6	2			9
U73	2	4	3			9
U74	4	4	7			15
U78	14	4	3			21
U82	2	4	8			14
U83	28	32	2			62
U84			3			3
U86			18			18
U91	5	106	5			126
U96	1		1			2
U99	10	20	1			31
101	14	12	7			33
TOTALS	212	409	503	55		1,064

ATTRITION RATE BY REASON

SHIPS CATEGORY = 3

REASONS FOR LOSS	NUMBER OF LOSSES				TOTAL
	FY81	FY82	FY83	FY84	
U11	1	1	4	1	6
U13	1	2	1		2
U16	1	2	3		6
U22	1				1
U31	5	1	1		7
U33			2		2
U60	2	32	4		60
U61	3	6	7		16
U64	1	4	68	11	84
U65	24	110	67	11	213
U67	5	54		8	67
U73	3	1	27	21	51
U74	2	1			3
U76	15	12	4	3	34
U79	4	12	11		27
U80		1			1
U82	24	19	14	1	58
U83			11		11
U84			7	5	12
U86	49	146	18		213
U91	9	1	1		11
U99	8	19	0	6	33
101		8			8
TOTALS	191	429	258	57	925

ATTRITION RATE BY REASON

SHIPS CATEGORY = 4

REASONS FOR LOSS	NUMBER OF LOSSES					TOTAL
	FY81	FY82	FY83	FY84		
U60		4				4
U61		1				1
U64		1	1			2
U65		2	5			7
U67		3	6			9
U76		1		1		2
U82	1		2			3
U83		4	1			5
U86	1	2				3
U99						
TOTALS	2	19	16	1		37

ATTRITION RATE BY REASON

SHIPS CATEGORY = 5

REASONS FOR LOSS	NUMBER OF LOSSES					TOTAL
	FY81	FY82	FY83	FY84		
U11	1	3	3			6
U13	3	4	3			8
U32		1				4
U33	5	13	9			27
U60						2
U61	1		5			6
U64	12	53	32			103
U65	2	17	35		6	55
U67	1					1
U70		2				3
U71	1	1	8			18
U73						1
U74	9	13	7			27
U78	1	1	3		1	5
U80		1				1
U84	11	4	19			34
U85						1
U84	30	34	8	3		75
U86			10			11
U91	0	1				1
U93	0	6	1			7
U101			4			4
TOTALS	94	207	150	20		471

ATTRITION RATE BY REASON
SHIPS CATEGORY = 1

REASONS FOR LOSS	NUMBER OF LOSSES					TOTAL
	FY85	FY86	FY87	FY88		
011	1	17	18	2		38
013		9	7	1		24
016	3	20	7	2		34
022			1			1
030						
032	9	2		1		14
060	26	5	2			33
063		38	19			57
064	5	15	1			21
065	58	210	153	14		435
071	60	246	137	19		502
073	27	7	0	2		36
074	20	3	3	1		27
078	21	6	8	3		38
080	1	47	11	3		61
082	14	5	3			22
083	20	1	3			24
084	33	101	60	9		203
086	9	2	3			14
091	1	4	1			6
096	2	1	1			4
098						
099	50	99	29	4		182
101						
TOTALS	331	895	494	52		1,772

ATTRITION RATE BY REASON
SHIPS CATEGORY = 2

REASONS FOR LOSS	NUMBER OF LOSSES				TOTAL
	FY85	FY86	FY87	FY88	
U11					20
U13	1	5	12	1	19
U16	4	7	3		14
U17		2			2
U22		1			1
U36	10	5	4	2	18
U64		11	7		18
U65	31	12	1		44
U67	10	10	7		27
U71	1	1	4	1	7
U73		1	1		2
U74	5	2			7
U76	9	13	8	3	33
U78	4	3	4	1	12
U80		4			4
U82	4	4	1		9
U83	6	44	1		51
U84	6	5	18		29
U86	9				9
U87	1				1
U90	1	3			4
U91		1			1
U96		1			1
U97	31	29	21	3	84
U101					
TOTALS	132	377	202	16	727

ATTRITION RATE BY REASON

SMIPS CATEGORY = 3

REASONS FOR LOSS	NUMBER OF LOSSES					TOTAL
	FY85	FY86	FY87	FY88		
011	1	13	9			20
013	1	1	3			1
019		1				1
022	2	3	2			8
032		1				1
050	7	6	6			19
060		5	6	1		20
064	22	110	1			209
065	25	117	29	4		173
071	1	1				2
073	5	1	5			10
074	5	2	3			10
076	6	13	3			21
078		4	3			7
080	1	1	1			3
082	13	2				15
083	14	38	15			67
084	1	3				4
087	1					1
091	1	1				2
097	1					1
099	20	43	12	2		77
101						1
TOTALS	118	376	165	11		670

ATTRITION RATE BY REASON

SHIPS CATEGORY = 4

REASONS FOR LOSS	NUMBER OF LOSSES					TOTAL
	FY85	FY86	FY87	FY88		
011	1		2		2	2
022	1					1
030	1		4			6
065		1	2	1		4
067		5	2			7
084	1					1
086	5	2				7
101						1
TOTALS	10	3	10	1		24

ATTIPTION RATE BY REASON

SHIPS CATEGORY = D

REASONS FOR LOSS	NUMBER OF LOSSES					TOTAL
	FY85	FY86	FY87	FY88		
U11	1	2				3
U13		2				2
U16	1					1
U32	2	1	1			4
U60		2		1		3
U64	3	25	13	1		42
U65	4	48	21	1		74
U71						2
U73		1		1		2
U74		1				1
U76	1	5				6
U78		2	2		1	5
U82			1			1
U84	3	12	15			30
U86		1				1
U91	1		1			2
U97	5	8	6		1	20
101						1
TOTALS	21	115	66	7		209

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