



2001 MARINER SURVEY PRINCIPAL FINDINGS



U.S. Department of Transportation
Bureau of Transportation Statistics

August 2001

U.S. Department of Transportation
Maritime Administration

EXECUTIVE SUMMARY

The *2001 Mariner Survey* was a concentrated effort to get feedback on key readiness issues using a sample of 10,000 merchant mariners from a population of approximately 104,000 qualified to serve on large ocean-going vessels. One hundred and forty-six mariners were deceased or otherwise unreachable, leaving an eligible sample of 9,854. Of the eligible sample, 4,046 completed surveys for an overall response rate of 41%. However, of the 5,808 that did not respond, 1,499 surveys were returned as undeliverable despite crosschecking with all available address sources. Of those who completed a survey, findings show that the majority of mariners:

- were serving in an afloat job during calendar year 2000 (68%),
- have served in a deep-sea position on a U.S. Flag vessel (62%), and
- would be willing to take an afloat position in the event of a National Defense Emergency (66%).

The majority (73%) of those mariners who would be willing to take an afloat position during an emergency reported they would be willing to serve a minimum of 90 days. Those mariners who indicated that they could not serve during an emergency were most likely to select their current employment (37%) or their family situation (26%) as the reason that would prevent them from serving. About half (49%) of all mariners reported that reemployment rights could make them more likely to be able to serve in a national emergency.

At the time of the survey, 45% of Unlimited License Holders and 29% of Other Mariners (see p. 2 for definitions of these terms) reported that they held an International Convention on Standards of Training, Certification, and Watchkeeping 1995 (STCW-95) certificate. Of those who did *not* hold the STCW-95, 40% of Unlimited License Holders and 30% of Other Mariners reported that they planned to meet the STCW-95 requirements.

BACKGROUND

The Maritime Administration (MARAD) contracted with the Bureau of Transportation Statistics (BTS) to conduct a survey of merchant mariners based on information provided by the U.S. Coast Guard. The primary purpose of the survey was to solicit information from mariners to:

- Determine mariners' willingness to perform sea duty during times of national emergency.
- Determine current and past employment patterns for mariners.
- Measure the impact of MARAD's maritime education and training programs.
- Measure mariners' progress in meeting the 1995 amendments to the International

Convention on Standards of Training, Certification, and Watchkeeping (STCW-95).

- Determine mariners' knowledge of their reemployment rights.

The ability to contact mariners is critical to MARAD's mission to maintain an adequate number of merchant mariners during peacetime and during times of national emergency.

Therefore, another major objective of the *2001 Mariner Survey* was to determine the feasibility of using the U.S. Coast Guard's Merchant Mariner Licensing and Documentation (MMLD) system as a means for locating and contacting mariners in times of a national defense emergency, given that the MMLD database was never intended for use as a means of contacting mariners.

METHODOLOGY

BTS and MARAD developed a four-page, 15-item questionnaire (available upon request) to collect information from a sample of merchant mariners. The first mailing of the questionnaire occurred on March 26th, 2001. A follow-up mailing was conducted on April 27th for nonrespondents whose questionnaires had not been returned as undeliverable by the postal service. Beginning May 15th, a telephone follow-up was conducted with a sample of mariners who had not yet responded to the mail survey. Data collection was closed on July 9th, 2001, ending a 15-week data collection period.

Sample Selection

The U.S. Coast Guard is the lead federal agency for regulating, licensing, and documenting professional merchant mariners. The U.S. Coast Guard's Merchant Mariner Licensing and Documentation (MMLD) system provides information on the qualifications and reported seafaring employment for both actively sailing and inactive mariners.

At the time of the survey, the MMLD contained information on over 210,000 individuals. From that file, a target population was identified of all mariners with documents appropriate for deep-sea employment as an officer (Unlimited License Holders) or other crewmember (Other Mariners) who had completed a document transaction within the last 6 years.

The 6-year time frame was selected because all mariners are required to renew licenses and documents on a 5-year cycle. Extending the time frame to 6 years allowed inclusion of mariners whose documents were less than 12 months out of date on the assumption that some proportion of these mariners would renew before the 12-month window for renewal had elapsed.

Based on the limited response period and the emphasis on reaching mariners who would be most readily available to crew large ocean-going vessels in the event of a national emergency, a small number of individuals with military addresses and/or foreign addresses were removed from the target population.

The final target population contained a total of 104,170 mariners—20,157 Unlimited License (UL) Holders and 84,013 Other Mariners. A sample of 10,000 mariners was randomly selected to participate in the survey. UL Holders were over-sampled to ensure sufficient numbers from this group to maintain acceptable confidence intervals for population and sub-group (e.g., rank or specialty) estimates. The final sample included 4,550 UL Holders and 5,450 Other Mariners.

Reliability of the Estimates

The findings summarized in this report are estimates derived from a sample survey. There are two major components of error in a sample survey—sampling and nonsampling error.

Sampling Error. Sampling error occurs because findings are based on a sample, rather than on the entire population. The total respondent pool for the mariner survey is 4,046 for an estimated sampling error of about $\pm 2\%$ at the 95% confidence level. This means that if a comparably sized series of additional samples was drawn from the current mariner population, 95% of the time results from those samples would fall within a range of $\pm 2\%$ of the results reported for the current sample. Sampling errors are larger for sample subgroups, such as mariners with deep-sea experience ($\pm 3\%$) because the respondent pool is smaller.

Nonsampling Error. Estimates are subject to various errors during the survey process, such as data collection, response coding, transcription, and data editing errors. These errors would also occur if a complete census was conducted under the same conditions as the sample survey. Explicit measures of the effects of these errors are not available. However, stringent quality control procedures were followed during data entry, and the questionnaire was reviewed and pretested in an effort to minimize nonsampling errors associated with data entry and questionnaire design.

Nonresponse error is a function of both the nonresponse rate and the differences, if any, between respondents and nonrespondents. In an effort to quantify nonresponse error, a sample of nonrespondents was selected to receive the survey using a telephone interview. Of the 2,000 nonrespondents selected, 1,282 were located and 765 completed the survey. Because the mail survey

had to be modified to fit Computer Assisted Telephone Interviewing (CATI) requirements, additional analysis is needed to assess the comparability of mail and telephone results. A report summarizing the telephone survey results will be available by September 30, 2001.

Response Rates

Final response rates for the mail survey were calculated using the American Association for Public Opinion Research guidelines (known as RR3) and are reported in table 1.

UL Holders (55%) were much more likely than Other Mariners (29%) to complete a survey questionnaire. One reason for the lower response rate for Other Mariners was the much higher incidence of incorrect mailing addresses for this group. Over 1,000 Other Mariners (19%) did not receive a survey because their address information was incorrect compared to 479 incorrect addresses for UL Holders (11%).

Table 1. Mail Survey Response Rates¹

	UL Holders	Others
Mailed out	4,550	5,450
Completed	2,477	1,569
Refused	13	12
Ineligible	79	67
No contact	1,981	3,802
Total Eligible	4,471	5,383
Completion Rate	55%	29%

SURVEY RESULTS

Current and Past Employment

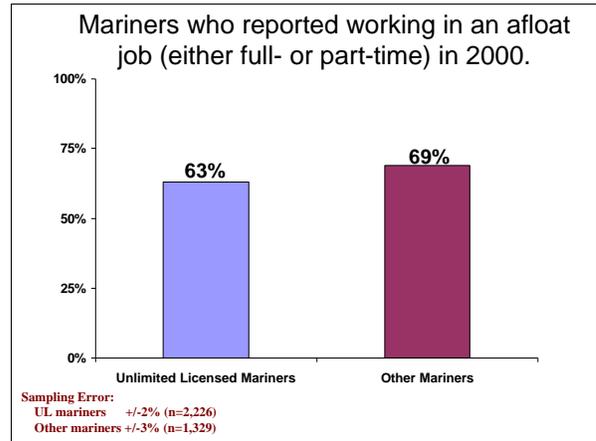
Based on employment practices within the merchant marine (e.g., crew rotations and extended vacations for shore-side relief), mariners are very likely to serve in an afloat position and an ashore position within the same calendar year. In fact, about one out of five (18%) of respondents to the

¹ Rates are calculated as follows: completed interviews ÷ [(completed interviews + partial interviews) + (refusals + Noncontacts + other) + e], where e is an estimate of the proportion of unknown outcomes that are eligible. e was calculated based on data from the phone survey because family/friends of mariners who answered the phone provided information on eligibility that could not be obtained from the mail survey. Of the mariners located for the phone survey, 97.2% of UL Holders and 98.6% of Other Mariners were found to be eligible to participate in the survey. Mariners were considered ineligible if they were deceased or had moved out of the country.

2001 Mariner Survey reported that they had been employed in both an afloat and an ashore position at the time they completed the survey.

Afloat Positions. In describing their employment, about two-thirds (68%) of all mariners reported that they worked in an afloat job either full- or part-time in 2000 (see chart 1).

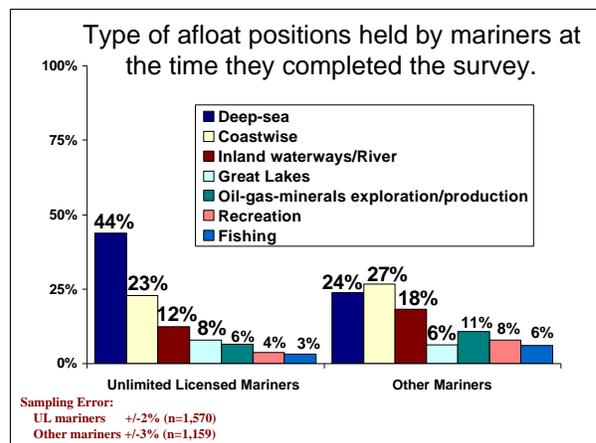
Chart 1. Working in Afloat Positions



The majority of both UL Holders and Other Mariners working in afloat positions were most likely to be in deep-sea, coastwise domestic, inland waterway/river, or Great Lakes positions (see chart 2). Only 13% of UL Holders and 25% of Other Mariners were assigned to oil/gas/minerals exploration, recreation, or fishing positions.

UL Holders (44%) were much more likely than Other Mariners (24%) to report that they were in a

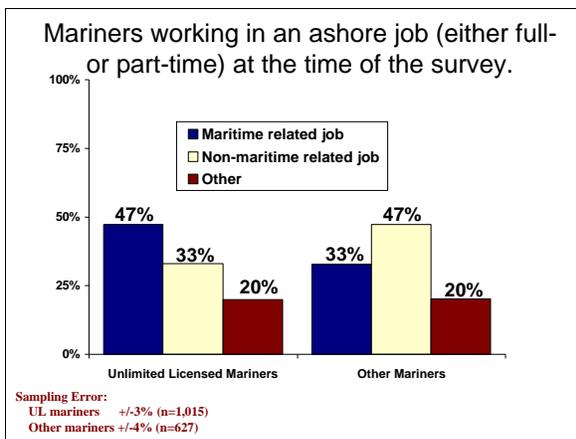
Chart 2. Types of Afloat Positions



deep-sea position at the time they completed the survey.

Ashore Positions. The long shore-side relief periods typical of deep-sea employment resulted in mariners with afloat positions also holding shore-side jobs. About 40% of all mariners reported that they were in an ashore position at the time of the survey (see chart 3). UL Holders (47%) were significantly more likely than Other Mariners (33%) to report that their ashore position was maritime-related, while Other Mariners were significantly more likely to report that their position was not maritime-related. (Of those mariners selecting “Other,” many reported that they were retired, unemployed, or in school.)

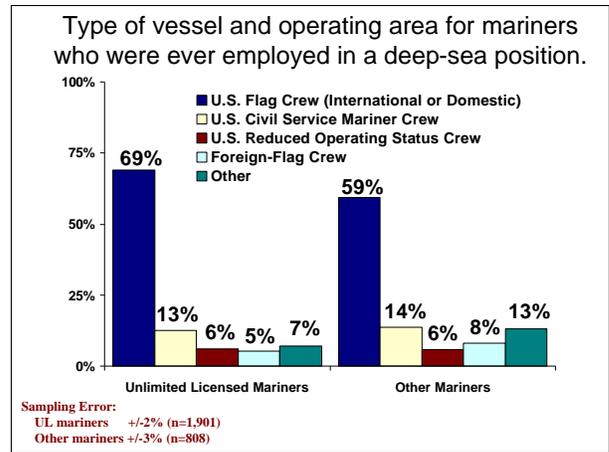
Chart 3. Mariner Ashore Jobs



Deep-Sea Positions. While the majority of both UL Holders (69%) and Other Mariners (59%) reported that they have served on a U.S. Flag deep-sea crew, UL Holders were significantly more likely than Other Mariners to have done so (see chart 4). In assessing the recency of their experience on a U.S. Flag deep-sea vessel, mariners reported as follows:

- 38% of UL Holders and 36% of Other Mariners have service in the past year;
- an additional 25% of UL Holders and 34% of Other Mariners have service that occurred 2-5 years ago; and,
- 37% of UL Holders and 30% of Other Mariners have service that occurred more than 5 years ago.

Chart 4. Mariner Deep-Sea Positions

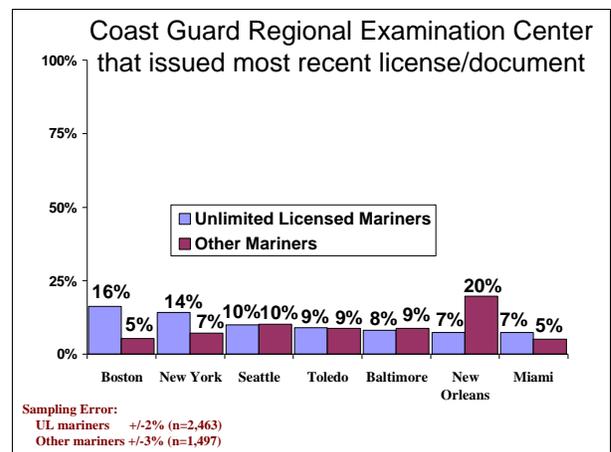


U.S. Coast Guard Licensing

Seven U.S. Coast Guard Regional Examination Centers (out of 17 possible sites) provided the most recent license or merchant mariner documents for 72% of UL Holders and 65% of Other Mariners (see chart 5).

While there were no significant differences for four of these centers (Seattle, Toledo, Baltimore, and Miami), there were significant differences for the remaining three. Specifically, UL Holders were significantly more likely than Other Mariners to report Boston and New York as the site of their most recent licensure, while Other Mariners were significantly more likely to report that they received their most recent license or documents from the U.S. Coast Guard Center in New Orleans.

Chart 5. Site of Most Recent Transaction

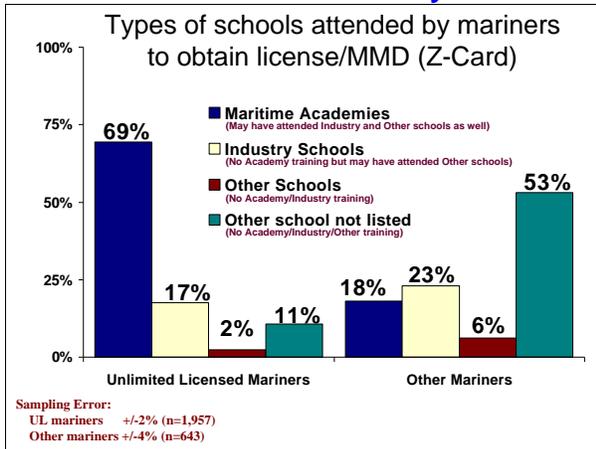


Mariner Training

The majority of UL Holders (79%) and about half (47%) of Other Mariners reported that they attended a maritime training school in order to meet part or all of the requirements for obtaining a U.S. Coast Guard license or merchant mariner's document (MMD or Z-Card).

Of those mariners who attended a maritime training school, UL Holders (69%) were much more likely than Other Mariners (18%) to have attended at least one of seven maritime academies to obtain their documents (see chart 6). Conversely, compared with UL Holders, Other Mariners (53%) were much more likely to have attended a school that was not among the list of schools included in the questionnaire.

Chart 6. Schools Attended by Mariners

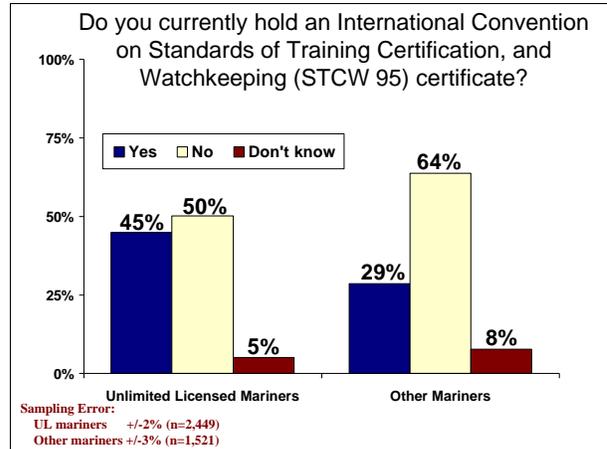


International Convention on Standards of Training, Certification, and Watchkeeping (STCW-95) Certificate

At the time of the survey, 45% of UL Holders and only 29% of Other Mariners reported that they held an STCW-95 certificate (see chart 7). Of those mariners who did *not* hold a certificate, only 40% of UL Holders and 30% of Other Mariners planned to attend specialized training designed to meet the STCW-95 requirements.

Additional analysis shows that mariners who were working in a deep-sea position at the time of the survey were much more likely to hold an STCW-95

Chart 7. STCW-95 Certification



certificate. Those mariners in deep-sea positions who did not have a certificate at the time of the survey were much more likely to report that they intended to complete training designed to meet the STCW-95 requirements.

Table 2. Status of STCW-95 Certificate for Mariners in a Deep-Sea Position

In deep-sea position at time of survey	UL Holders	Other Mariners
Held certificate	65%	53%
Did not hold certificate	34%	44%
Planned to attend training (of those w/o certificate)	80%	57%

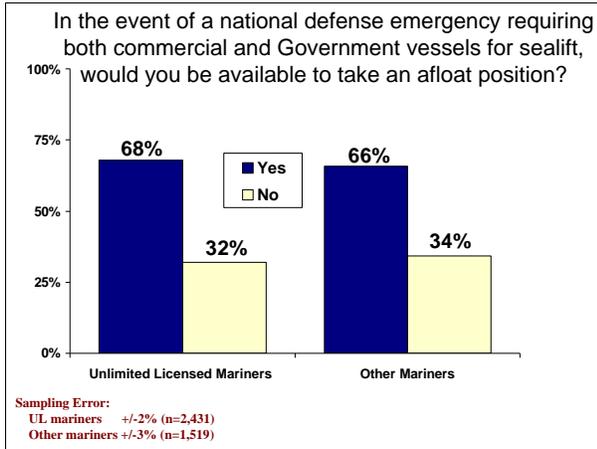
As shown in table 2, of the 34% of UL Holders who did not hold a certificate at the time of the survey, 80% planned to attend training to obtain the certificate, which would result in an additional 27% of UL Holders with certificates (34% x 80% = 27%). Assuming that these mariners follow through with the required training, eventually 92% (65% who have a certificate + 27% who will obtain one) of UL Holders who were in a deep-sea position at the time of the survey could meet the requirements for the STCW-95 certificate.

Using the same methodology, eventually 78% of Other Mariners who were in deep-sea positions at the time of the survey could meet the requirements for an STCW-95 certificate.

Availability During National Defense Emergency

About two-thirds of both UL Holders (68%) and Other Mariners (66%) reported that they would be available to take an afloat position in the event of a national defense emergency (see chart 8).

Chart 8. Serving During National Emergency



Of those mariners indicating that they would be available, the majority (77% of UL Holders and 73% of Other Mariners) reported that they could serve in an afloat position for at least 90 days or more (see chart 9).

The most frequently given reasons for not being able to serve during a national defense emergency

Chart 9. Length of Availability

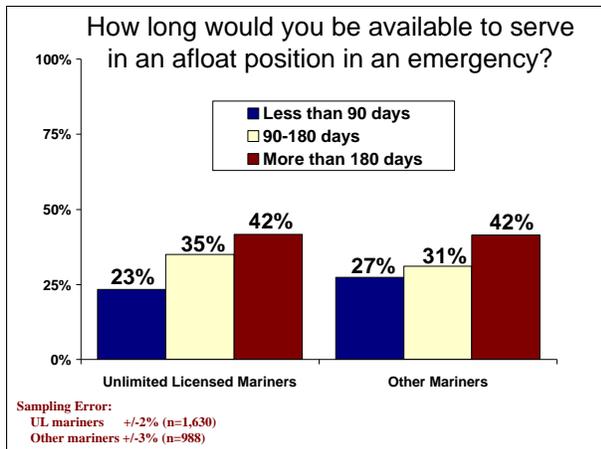
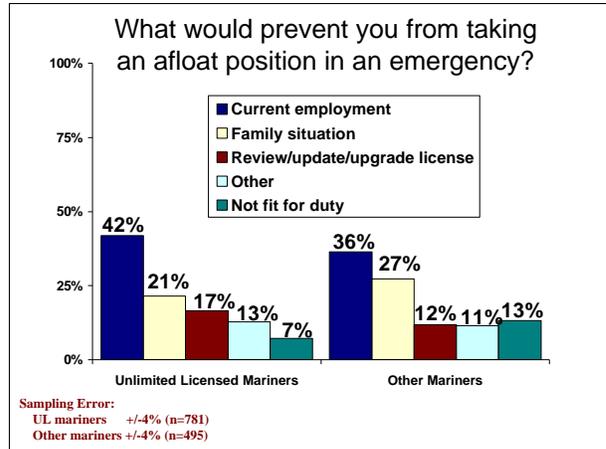


Chart 10. Reasons for Unavailability



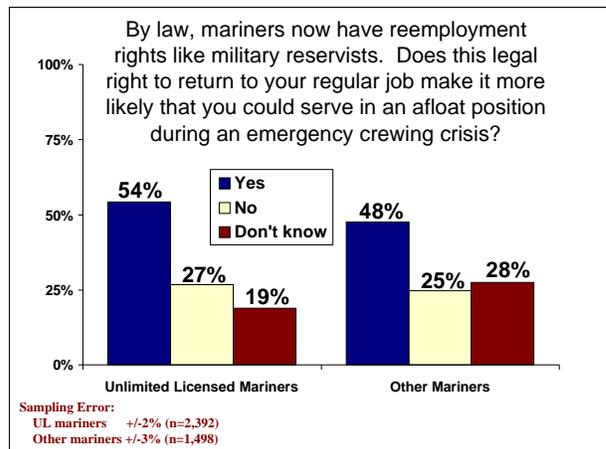
were current employment and family situations (see chart 10).

Reemployment Rights

Mariners were asked whether the legal right to return to their regular job would make serving in an afloat position during times of emergency more likely (see chart 11). Compared to Other Mariners (48%), UL Holders (54%) were more likely to report that reemployment rights could make it more likely for them to serve in an afloat position in an emergency situation.

Of all mariners who reported that they would not be available to serve in an emergency crewing crisis, 16% indicated that reemployment rights could make them more likely to serve.

Chart 11. Reemployment Rights



Locating Mariners

The U.S. Coast Guard’s MMLD database was used to select the sample for the 2001 *Mariner Survey*. However, the MMLD was never intended for use as a means of contacting mariners, so address information was known to be out-dated or incomplete. Therefore, a major focus of the mariner survey effort was to determine the feasibility of using the MMLD as a means for locating and contacting mariners in times of a National Defense emergency, which is a primary concern of MARAD.

Based on the current sample, it is reasonable to assume that at least half of the current population of mariners with documents appropriate for deep-sea service could be reached by using the information in the MMLD if the database is routinely updated based on postal system files and both mail and phone contacts are attempted.

Methodology. The study included several steps both before and during data collection to increase the likelihood of locating merchant mariners selected for our sample. Before actually drawing the sample, we subjected the 104,000+ database to a crosscheck with the U.S. Postal Service’s National Change of Address file. After completing the crosscheck, we found that 25% of the addresses in the MMLD did not match the postal system file and 33% of the phone numbers in the MMLD were changed or updated.

Despite this crosscheck, 1,035 surveys were returned as undeliverable by the postal system. Prior to the second mailing, 500 envelopes that had been returned as undeliverable were selected as a test case for using the Internet to obtain new addresses. After 48 person-hours of effort, 93 new addresses were obtained. In addition, the postal system had returned 35 envelopes with a forwarding address given, but the forwarding order had expired, thus requiring remailing. These 128 test cases were included in the second mailing.

Results for the Internet-obtained addresses and the forwarding addresses were somewhat disappointing (see table 3). Although we had obtained what appeared to be correct new addresses, we still had undeliverables and the noncontact rate for both groups (57% and 63%) was much higher than for

the total sample (26%). It appears that Internet searches and relying on forwarding addresses are not very cost-effective methods for locating mariners.

Table 3. New Address Search

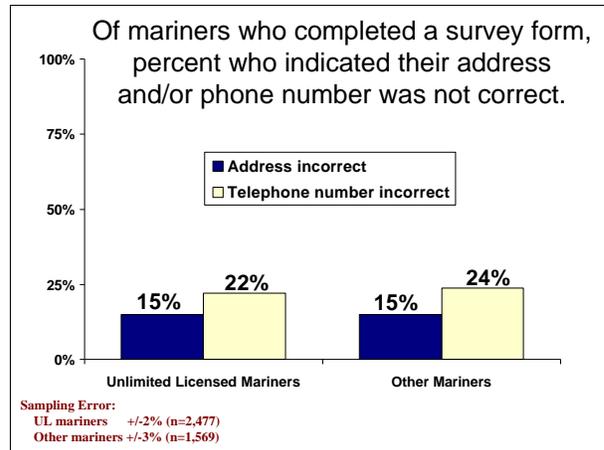
Of the 93 Internet addresses	
Completed surveys received (20)	22%
Deceased (1)	1%
Returned as Undeliverable (19)	20%
No contact after mailing (53)	57%
Of the 35 forwarding addresses	
Completed surveys received (10)	29%
Returned as Undeliverable (3)	9%
No contact after mailing (22)	63%

In an additional effort to capture how reliable the MMLD database was, mariners who completed the survey were asked to review the address and phone number information printed on the survey and to provide corrections as needed. Of those mariners who completed a survey, 15% reported some correction to their mailing address and over 20% reported a correction to their phone number (see chart 12).

As a final effort to contact as many mariners as possible, we conducted phone interviews with a sample of the nonrespondents with two goals in mind:

- To determine how difficult it would be to contact mariners by phone, and

Chart 12. Address Corrections



- To explore whether there are attitudinal differences between respondents and nonrespondents.

At the beginning of the telephone data collection, we had heard nothing from about 5,500 mariners of whom about 4,000 had a phone number listed in the database. Taking into account available funds, time constraints, and an anticipated response rate of at least 35% (which is comparable to other national phone surveys), a sample size of 2,000 was selected. The sample included 800 UL Holders and 1,200 Other Mariners. Dispositions for the telephone survey are shown in table 4.

Table 4. Telephone Survey Dispositions

	UL Holders	Others
Sample	800	1,200
Completed	342	423
Not located	223	482
Located-not available	158	199
Located-refused	55	79
[Ineligible]	[22]	[17]
Total	778	1,183
Completion rate	44%	36%

Final Contact Rate. The phone and mail survey efforts resulted in the following:

- 5,270 of the 10,000 mariners in our sample were located (not all were respondents).
- 2,163 mariners were classified as known incorrect addresses/and or phone numbers.
 - 1,499 mariners with incorrect addresses (returned as undeliverable by the postal system).
 - 664 mariners with incorrect phone numbers (disconnected, etc).

- 2,567 mariners were classified as “Other” nonrespondents—that is we don’t know if the questionnaire reached them because nothing was returned by the postal system or the phone was never answered.

REVIEW

Based on the total respondent pool of 4,046 (with a sampling error of about ±2% at the 95% confidence level), the following generalizations can be made for the target population of 104,170 merchant mariners:

- About two-thirds (66%) of all mariners report they are willing to perform sea duty during times of national emergency.
- About two-thirds (68%) of all mariners were employed either full- or part-time in an afloat position during 2000.
- The majority of UL Holders (79%) and about half (47%) of Other Mariners attended a maritime training school in order to meet part or all of the requirements for obtaining a U.S. Coast Guard license or merchant mariner’s document.
- At the time of the survey, 45% of UL Holders and 29% of Other Mariners held an STCW-95 certificate. However, for mariners working in a deep-sea position at the time of the survey, 65% of UL Holders and 53% of Other Mariners held certificates.
- About half (49%) of all mariners indicated that reemployment rights could make it more likely that they would serve in a national emergency.
- About half (53%) of all mariners with documents appropriate for deep-sea service could be reached by using the information in the MMLD if the database is routinely updated based on postal system files and both mail and phone contacts are attempted.



U.S. Department of Transportation

The Office of Survey Programs, Bureau of Transportation Statistics, produced this report. Additional information can be obtained by calling (202) 366-4743 or by contacting the Maritime Administration’s Office of Public Affairs at (202) 366-5807.