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Special issue on merchant vessel personnel

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Proceedings
of the Marine Safety Council
September-October 1991 *Vol. 48, No 5*

Special issue on merchant vessel personnel

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Cover

Able Bodied Seaman Ron Mena steadies the gangway for docking on *USNS Capella*, a fast sealift cargo vessel with a civilian crew.

Photo courtesy of the Safarers International Union

Next issue

The November-December 1991 issue of *Proceedings of the Marine Safety Council* will be devoted to fishing vessel safety.

Derek Solar, 19, is sworn in for a 100-ton master's license by LTJG Doug Ellis, a license evaluator at MSO New Orleans.

Photo by YN3 Joseph Relle, MSO New Orleans

Tomorrow's merchant mariner

Mr. Frank J. Flyntz

Marine technology is constantly improving and, hopefully, making the job of the merchant mariner easier and more efficient. Future innovations, however, will demand a delicate balance between automation and manning.

Every day, large ships are being designed and constructed to employ new technologies that reduce the need for direct human interaction in day-to-day operations.

Nevertheless, the more sophisticated the equipment, the greater the need for human monitoring, supervision and maintenance.

Human element

For many years, the major regulatory focus has been on the improvement of hardware aboard ship, the automation of engineroom and bridge operations, new cargo-handling gear and modern navigation methods. The human element was very much neglected, until serious accidents focused attention on the fact that approximately 80 percent of all casualties are caused by human error.

This statistic compels us to shift our emphasis to the personnel aspects of the merchant marine, if we are to increase safety of life at sea. Effective individual training and qualifications, efficient shoreside management and precise requirements for training institutions must all be considered for the safe and proper operation of vessels.

No matter how technologically advanced we become, people will always have to enter into the equation. **Personnel must be well qualified to assure the proper use and effective operation of all new equipment.**

The staff of the Merchant Vessel Personnel Division of the Coast Guard's Office of Marine Safety, Security and Environmental Protection is dedicated toward this objective.

Manning

The Vessel Manning Branch is tackling such sensitive issues as crew reduction through automation both in the engineroom and on deck. The branch is involved in fatigue studies, watchkeeping evaluations, and international efforts to standardize and improve mariner qualifications.

The Shipboard Piloting Expert System is an example of technology that is rapidly challenging traditional manning concepts. It must be carefully integrated to avoid dangerous over reliance on electronic aids that are designed to aid mariners, not replace them.

Licensing

The Licensing and Evaluation Branch is actively involved in drug testing and substance abuser identification programs, which are designed to foster the drug free working environment that is crucial to maritime safety.

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In addition, the branch meticulously screens license applications, ensuring that merchant mariners have all the necessary credentials to operate safely at sea.

Qualifications

The Personnel Qualifications Branch carefully reviews the requirements for all levels of licenses and endorsements, balancing them against current trends in equipment and technology.

Furthermore, the branch closely follows and analyzes international maritime trends, using them as guidelines in programming, particularly since the United States has now ratified the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.

Documentation

The Seaman Documentation and Records Branch provides a vital service to merchant mariners in maintaining thousands of individual records, shipping articles and discharge certificates.

Examination

The Merchant Marine Examination Branch stays abreast of the latest in marine hardware, analyzes traditional elements of seamanship in the light of modern technology, and keeps up with business and industrial trends. The branch constantly reviews and updates all examinations to be sure that they effectively measure an individual's skills and knowledge, as well as the ability to apply them in any given situation.

Furthermore, the branch is streamlining the entire examination drafting and administration processes with state-of-the art computerization methods.

Pilotage

The recent creation of the Pilotage Branch adds the oversight of Great Lakes pilotage to national pilotage issues within the division.

WWII veterans

The World War II Merchant Marine Veteran's Branch processes applications for veteran's s ta-tus of merchant mariners who served overseas during World War II. To date, more than 69,000 mariners have been determined eligible for such status.

Conclusion

The Merchant Vessel Personnel Division will continue to apply hard-learned lessons of the past to the benefits of the latest innovations of technology, balancing industrial trends with safety requirements, and generating a stronger merchant marine.

Mr. Frank J. Flyntz is the assistant chief of the Merchant Vessel Personnel Division of the Coast Guard's Office of Marine Safety, Security and Environmental Protection.

CAPT Buddy Muirhead, who has been sailing for 38 years, pilots the steamship Delta Queen up the Mississippi River.

Photo by YN3 Joseph Relle

Record retrieval is streamlined

Mrs. Justine Bunnell

The Coast Guard has maintained records of all United States merchant mariner documents issued since 1937. These records are kept at Coast Guard headquarters for three years after the mariner's last sailing date, and then transferred to the Federal Records Center, Suitland, Maryland, to be stored for an additional 60 years.

Backlog

In October 1986, the responsibilities of the Seaman Documentation and Records Branch of the Merchant Vessel Personnel Division were contracted out under the Commercial Activities Program established by the Office of Management and Budget Circular A76. The purpose of this circular is to encourage federal government agencies to rely on the private sector for products and services.

Due to a decrease in government personnel prior to 1986, there was a backlog of records to be processed. This backlog increased dramatically, because the resources were insufficient to process even the current workload.

Coast Guard personnel continued to process all fingerprint cards, because third parties cannot have access to FBI information. In April 1988, the Coast Guard resumed responsibility for responding to Congressional and Freedom of Information Act requests, verifying information for duplicate merchant mariner's documents, and reviewing applications for supplemental endorsements to merchant mariners. Due to the time needed to hire personnel to perform these tasks, the backlog continued to increase.

Retrieval rate

In the past, retrieval of these records was not very reliable. In fact, the average rate of retrieving records from the Federal Records Center from an initial search was only 33 percent in 1987. This was due to the many changes in the program and personnel over the years, and the fact that lists of all the center's files were maintained manually.

In 1988, when veteran's status was granted to qualified World War II merchant mariners, up to 400 records were requested per day from the Federal Records Center. The 33 percent retrieval rate was unacceptable.

Computerization

The contract also involved developing a quicker and more efficient system for locating and retrieving records. After a thorough review of the process, it was determined that the most effective method was to establish a database containing a list of all merchant mariner records and their location.

The development of the database started in September 1989, and the first entry was made in June 1990. To date, data for more than 600,000 records has been entered. This data includes name, social security number, book or Z number, date and place of birth, date and place of document issue, and the location of the record.

The backlog has been reduced while current workloads are under control. Most important, the initial record retrieval rate has been increased to 70 percent.

The same database will be used for the merchant marine licensing and documentation portion of the Marine Safety Network, which will gather all information on merchant mariners in one central national system.

Goals

The data entry of existing records at the Federal Records Center is scheduled to be completed by September 30, 1991. The backlog for processing applications for duplicate documents and certificates of discharge should be completed at the same time.

The goal is to process all current applications for duplicate merchant mariner's documents and certificates of discharge within 30 days or less after they arrive from regional examination centers.

Mrs. Justine Bunnell is the chief of the Seaman Documentation Branch of the Merchant Vessel Personnel Division of the Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-0234.

"Expert" automatic pilot

Mr. Eric Quick

As merchant vessels grow larger and deeper in draft, the need for pinpoint accuracy in navigation and piloting becomes more acute. The grounding of the *Exxon Valdez* vividly documented the environmental consequences of an error in judgment.

Ship's officers are presently confronted with all kinds of complex, sophisticated monitoring systems. There is a real danger that this confusing array of technology could overwhelm officers when they are faced with critical navigation and piloting decisions.

Solution development

Dr. Martha Grabowski, a research assistant professor at Rensselaer Polytechnic Institute in Troy, New York, is developing an expert system for automatic ship navigation and piloting.

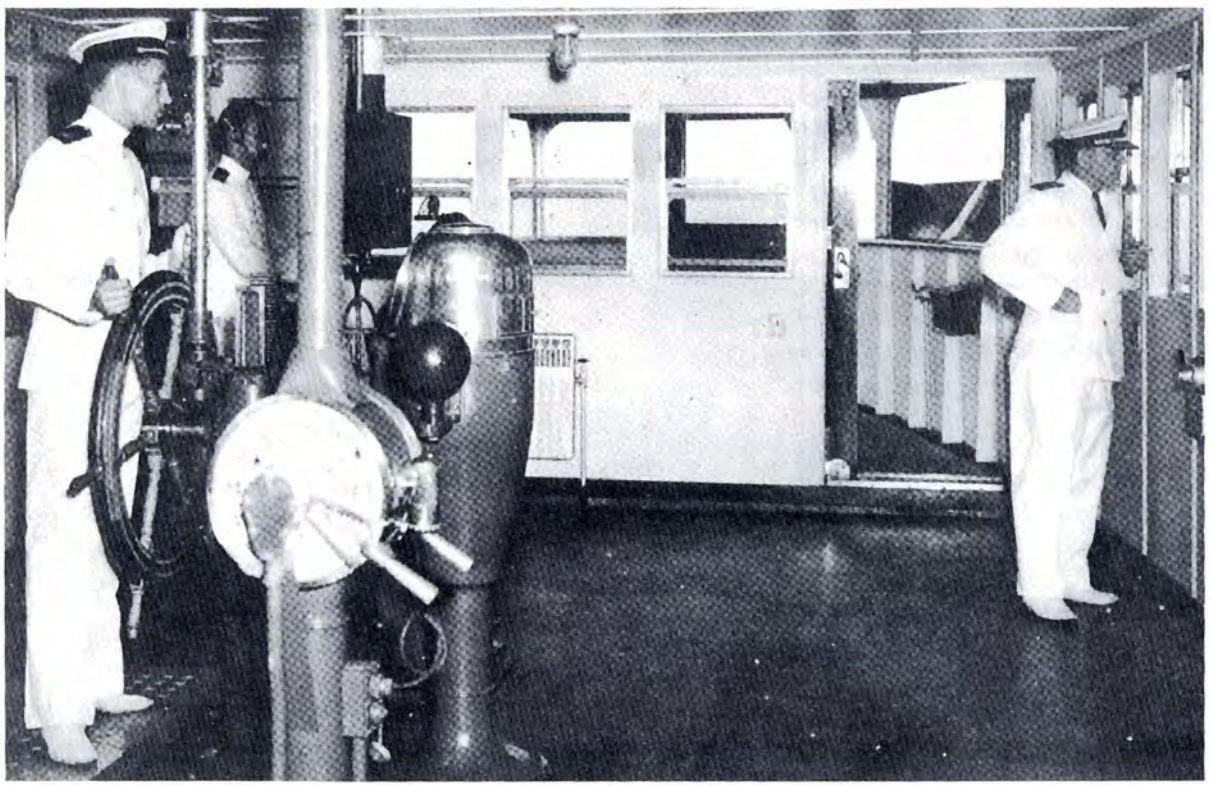
Working with the Maritime Administration, Coast Guard, National Oceanic Atmospheric Administration, Exxon, Sperry Marine and others, Dr. Grabowski hopes this system will relieve ship's officers of monotonous routine duties, freeing them to concentrate on vital command decisions.

Expert systems are computer programs providing knowledge derived from specific areas of facts, beliefs and experiences, according to Dr. Grabowski. The systems attempt to mimic the reasoning and decision-making processes of human experts by combining acquired knowledge and experience, or rules of thumb, to solve difficult problems.

Waiting for two reference points ashore to come in line as a range before executing a turn is an illustration of applying experience and self-education.

The researchers for this project accompanied ship's officers at sea while they "thought out loud" piloting and navigation decisions. This enabled the researchers to identify unique individual experiences, and those commonly shared. Approximately 70 percent of the experiences were subjective and 30 percent were shared.

The way it was done before today's technology-- a junior officer steers the course as given to him by the officer of the watch on the bridge of a merchant ship. (Photos courtesy of the National Cargo Bureau, Inc.)



Resulting system

After nearly two years, this research and study is beginning to bear fruit. A positioning system integrated with a sophisticated computer is evolving to support command decisions of pilots and navigation officers at sea. It is called the Shipboard Piloting Expert System (S.P.E.S.). A prototype is already being tested at sea.

Primary navigation data will arrive with submeter accuracy from the Differential Global Positioning System, which consists of 18 navigation satellites orbiting around the earth. The satellites transmit radio waves that are picked up by a receiving station on the planet's surface. The station then measures the Doppler shift of the transmitted waves, and calculates the vessel's position to within a few meters.

The system will also receive data from the vessel's gyro compass and automatic radar plotting aid, along with information on visibility and sea conditions directly from the officer on watch.

For example, in zero visibility, the system may recommend reducing speed to bare steerage, calling the master and posting a lookout forward.

"Shooting the sun" with a sextant is "old world" navigation compared to today's computerized systems.

Features

S.P.E.S. will automatically plot the ship's position as it travels, so that an officer can glance and see "you are here" at any time. The system will also have a micro chip to enable it to take course and speed data from the automatic radar plotting aid in order to maneuver the vessel according to the rules of the road.

The computer screen will contain a digital chart displaying the user's geographical area, as well as appropriate ship's courses and other vital features of the hydrographic data base.

In cooperation with Woods Hole Oceanographic Institute, the National Oceanic Atmospheric Administration is designing an electronic chart to be as accurate as any available conventional chart.

The S.P.E.S. will be voice activated to warn ship's officers of impending collisions or groundings. In response to visibility and sea-condition data, the system will recommend courses of action dictated by rules of good seamanship.

In addition, as the vessel's progress is tracked on the electronic chart display and it approaches a dangerous shoal, the S.P.E.S. will recommend a change of course to prevent it from grounding. If the user does not acknowledge and accept this course alteration or fails to enter an alternative course, the S.P.E.S. will determine that a grounding is eminent and take appropriate action to avoid a collision.

Another innovation will allow the ship's officer to rehearse a transit of the route to be taken, much like operating on an automatic radar plotting aid in the trial mode. While the vessel lies safely at the dock, the ship's officer can rehearse a mock transit of the route to get an idea of the navigational hazards that may be encountered. The unit will run the ship down the channel as the electronic chart continues to scroll up so that the transit may be rehearsed at several times the speed of the real voyage.

Conclusion

Nearing the third and final year of its development, the system promises to reach an important milestone in the evolution of marine navigation and computer sciences.

It is truly an automatic pilot -- much more than the gyro pilot or "iron mike" currently in use by the industry today.

Mr. Eric Quick is the assistant chief of the Licensing and Evaluation Branch of the Merchant Vessel Personnel Division, Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-6828.

A closer look at licensing

Mr. Peter S. A. Palmer

The Coast Guard is planning to conduct a comprehensive study of ways to improve the overall effectiveness of its licensing and certification processes. The goal is to ensure that American flag vessel mariners have the necessary skills and knowledge.

The study may recommend changes to upgrade the professional qualifications of licensed and unlicensed seafarers serving aboard the many varieties of merchant ships, tugs, passenger vessels and other craft.

It also may recommend reductions in the Coast Guard resources which support the licensing and certification program, while, at the same time, maintaining the desired standards.

Today's requirements

All merchant mariners must have United States merchant mariner documents and/or licenses issued by the Coast Guard. The applicants must meet specific citizenship, physical and professional requirements before being issued licenses or unlicensed ratings.

The required experience and professional qualifications for certification and licensing of merchant mariners are found in 46 United States Code and title 46 Code of Federal Regulations, parts 10 and 12.

A minimum amount of sea service and the satisfactory completion of written examinations are the basic requirements for the various licenses and document ratings under current statutes and regulations. With few exceptions, professional training is not required.

Training status

The Coast Guard has no procedures for determining the amount and quality of training during a mariner's sea service. This responsibility rests primarily with the marine industry. The Coast Guard approves training courses that mariners may complete through private institutions to obtain sea service credit toward a license or document, but most courses do not include demonstrated practical testing.

Licensed mariners serving ashore may renew their licenses by successfully completing a Coast Guard-approved refresher course or written exercise. Unlicensed mariners do not have to complete any periodic training. Mariners may serve aboard a vessel after extensive periods away from practical shipboard operations without any refresher training.

Recognition is growing among marine employers of the need for increased knowledge of sophisticated shipboard equipment and hazardous operations aboard many merchant vessels. Consequently, there is more and more industry support for mandatory ongoing practical training requirements for mariners, particularly when assuming shipboard responsibilities after an absence.

Evaluation

The Coast Guard will evaluate the current licensing and certification regulations, and will consider modifications, which may involve practical experience and training requirements.

In addition, the study will review primary functions of mariner positions in the deck and engine departments to determine hazardous operations and to consider special training needs. The study will also identify any additional costs the recommended changes may impose on the industry.

Identification

The Coast Guard will identify potential improvements in two major areas of the marine licensing program as follows:

1) Improved methods of determining licensing and certification requirements for shipboard positions based on the skills needed.

2) More effective methods of ensuring that mariners have the necessary skills. (This may involve practical demonstrations.)

Questions

The following questions will be addressed in the study:

- Should licenses and endorsements be restricted to the type of vessel (horsepower or tonnage) and class (type of equipment - steam, motor, etc.) on which mariners gain experience?
- Should the Coast Guard require periodic refresher training for mariners not continuously employed aboard vessels? If so, what kind of training should be required?
- Should licensed mariners without recent sea experience be required to serve in licensed capacities or as observers for a specific period of time aboard vessels with the same horsepower or tonnage as on their licenses before the licenses can be renewed?
- Should there be special practical training required for each grade of license or rating?
- Should entry-level mariners have to complete basic training and demonstrate certain skills before sea service?
- Should periodic renewal of unlicensed ratings based on recent experience or training be required?
- Should mariners' basic training skills be reviewed by a higher-ranking licensed officer or a Coast Guard examiner?
- Should the Coast Guard continue to examine mariners or should this task be performed by maritime institutions, contractors or others?

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Merchant marine trainees are taught lifeboat handling at the Harry Lungberg School of Seamanship, Piney Point, Maryland. *Photo by YN2 Anthony Peterson*

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- Should mariners be required to complete specific training courses before being issued licenses or endorsements?
- Should the completion of formal training at recognized institutions be allowed to substitute for Coast Guard examinations?
- What form and extent of oversight would be necessary to maintain course standards and prevent fraud and abuse if formal training courses are allowed to replace Coast Guard exams?
- Should the Coast Guard phase out all examinations and require applicants to be trained by third parties to satisfy license and certification requirements?
- Should mariners be provided the option of completing courses or the Coast Guard exams to satisfy these requirements?
- Should the use of bridge and engineroom simulators be required in training for any particular license, crew position or for employment on ships engaged in specified services?
- Should holders of certain licenses and ratings be required to complete periodic simulator training?
- Should tanker crews have to complete additional training or experience to that required for comparable positions on non-tank vessels?
- Should the Coast Guard consider any modifications to its current licensing structure?

Study subjects

Representative licenses for the following will be evaluated in detail:

A) Third mates on ocean-going steam and motor vessels. (This includes candidates from all sources.)

B) Third assistant engineers on all horsepower steam and motor vessels. (This includes candidates from all sources.)

C) Operators of uninspected towing vessels.

D) Masters of steam and motor vessels of 100 gross tons and under.

Procedures

The study may determine areas of modifications to Coast Guard procedures in setting qualifications for each of the licenses evaluated. This will be accomplished by:

- Reviewing 46 United States Code, title 46 CFR parts 10 and 12, and Marine Safety Manuals.
- Interviewing shipboard personnel in each rating to identify duties and responsibilities.
- Interviewing maritime instructors, ship operating company officials, federal agency representatives and foreign maritime counterparts.

Conclusion

This study will begin in the fall of 1991, and is estimated to take about 18 months. Any major recommendations to alter current Coast Guard licensing and certificating structure could have a significant impact on qualifying personnel to serve aboard United States vessels.

Any recommended regulation changes will be published in the *Federal Register* as notices of proposed rulemaking requesting public comments.

Mr. Peter S.A. Palmer is a maritime instructional specialist with the Personnel Qualifications Branch of the Merchant Vessel Personnel Division of the Office of Marine Safety, Security and Environmental Protection. Telephone (202) 267-0226.

1990 license statistics
Deck department

	Issues	Endorsements	Failures	Renewals
Master ocean AGT*	113	25	1	488
Master near coastal AGT	8	0	0	13
Chief mate ocean AGT	69	38	2	137
Chief mate near coastal AGT	0	1	0	0
Second mate ocean AGT	135	21	1	141
Second mate near coastal AGT	4	1	0	0
Third mate ocean AGT	224	16	7	317
Third mate near coastal AGT	3	0	0	4
Master ocean or near coastal NMT** 1600 GT	259	197	8	578
Mate ocean or near coastal NMT 1600 GT	129	41	17	84
Master ocean or near coastal NMT 500 GT	72	76	11	493
Mate ocean or near coastal NMT 500 GT	41	8	6	86
Master ocean or near coastal NMT 200 GT	85	91	10	213
Mate near coastal NMT 200 GT	213	28	18	6
Master near coastal NMT 100 GT	1972	404	159	3183
Master uninspected fishing industry vessel	48	73	0	98
Mate uninspected fishing industry vessel	39	26	0	16
Master MODU***	96	1	1	27

Deck department cont.

	Issues	Endorsements	Failures	Renewals
Mate MODU	5	1	0	6
Master Great Lakes and inland AGT	19	10	1	145
Master inland AGT	14	5	0	110
Mate Great Lakes and inland AGT	18	18	0	65
Master Great Lakes and inland NMT 1600 GT	12	10	0	27
Mate Great Lakes and inland NMT 1600 GT	22	2	3	4
Master Great Lakes and inland NMT 200 GT	8	9	6	14
Mate Great Lakes and inland NMT 200 GT	16	1	0	0
Master inland NMT 100 GT	1041	90	134	895
Limited master Great Lakes and inland	1151	100	142	1035
First class pilot	71	282	2	729
Operator uninspected towing vessel	335	77	31	1478
Second class operator uninspected towing vessel	74	6	6	38
Operator uninspected passenger vessel	1219	44	92	1601
Master liftboat	53	1	3	3
Assistance towing endorsement	389	61	5	65
TOTALS:	[illegible]	[illegible]	[illegible]	[illegible]

*Any gross tons ** Not more than ***Mobile offshore drilling unit

Engine department

	Issues	Endorsements	Failures	Renewals
Chief engineer motor	36	32	0	86
First asst. engineer motor	36	24	0	43
Second asst. engineer motor	49	18	2	58
Third asst. engineer motor	85	8	1	262
Chief engineer steam	45	14	2	183
First asst. engineer steam	47	16	1	109
Second asst. engineer steam	47	5	0	155
Third asst. engineer steam	71	11	0	140
Chief engineer S or M Unl*	21	1	0	180
First asst. engineer S or M Unl	28	4	0	48
Second asst. eng. S or M Unl	54	4	0	44
Third asst. eng. S or M Unl	236	0	4	354
Chief engineer limited oceans	41	63	1	416
Chief eng. limited near coastal	33	7	1	58
Assistant engineer limited	44	11	3	46
Designated duty engineer	135	22	7	4
Chief engineer uninspected fishing industry vessel	21	21	0	0
Assistant engineer uninspected fishing industry vessel	10	3	0	10
Chief engineer MODU	8	0	0	8
Assistant engineer MODU	1	0	0	3
Lifeboat engineer	0	0	0	0
TOTALS:	1048	267	16	2212

*** Steam or motor unlimited**

Radio officer and certificates of registry

	Issues	Endorsements	Failures	Renewals
Radio officer	37	0	n/a	122
Chief purser	8	0	n/a	0
Purser	12	0	n/a	0
Senior assistant purser	3	0	n/a	0
Junior assistant purser	21	0	n/a	0
Medical doctor	3	0	n/a	0
Professional nurse	9	0	n/a	0
Marine physician	5	0	n/a	0
Hospital corpsman	17	1	n/a	0
TOTALS:	115	1	n/a	122

Summary 1990 license transactions

	Issues	Endorsements	Failures	Renewals
Deck department	7957	1764	666	12,119
Engine department	1048	267	16	2,212
Radio and staff officers	115	1	n/a	122
TOTALS:	9120	2032	682	14,453

GRAND TOTAL: 26,287

Exam centers enter computer age

Mr. Peter S. A. Palmer

Operations in 17 Coast Guard regional examination centers all over the country will be computerized by next year. The new system, called Merchant Marine Licensing and Documentation (MMLD), ensures that licensing, certification, evaluation and examination activities will be far more efficient at all centers.

The computerized system should greatly improve licensing and documentation management nationally, and streamline application processing at the regional exam centers.

Marine Safety Network

The Marine Safety Network is the largest computer operation in the Coast Guard today. Started in 1986, it was previously known as the Marine Safety Information System II.

The first prototype MMLD system is being developed and installed within the Marine Safety Network. The MMLD will be tested soon at Coast Guard headquarters and exam centers in New Orleans and Seattle. It is expected to be completely operational in all 17 centers by 1992.

The MMLD is designed to give Coast Guard personnel greater flexibility and ease in examining and sorting data.

Present system

Currently, each examination center is equipped with an inefficient computer system that cannot issue merchant mariner documents and licenses. The centers all maintain their own local licensing files, while headquarters keeps limited central records.

Coast Guard headquarters maintains primary merchant mariner document files which are not readily accessible to field personnel.

New features

The MMLD system will provide the following features:

1) Printing of licenses and documents,

2) Access to filing certificates of discharge and information held by headquarters,

3) A more efficient file management and application process for headquarters and exam centers,

4) Updates on status of applicants by the centers,

5) Interaction with existing computer software packages on current workstations that provide word processing and spreadsheet capabilities,

6) Automation of exam center correspondence and labels,

7) Accumulation of historical data and seamen profiles in a centralized location.

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Applicants for merchant mariner licenses take their exams in a test room of the Regional Examination Center in Baltimore, Maryland.

Photo by Senior Chief C.C. Sammons, QMCS

The MMLD system would identify qualified mariners like QMED E.C. Ammons. He is shown readying engineroom equipment of a ready reserve vessel for Middle East voyage. Photo courtesy of Seafarers International Union

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Most important, the MMLD system will assist field personnel by identifying qualified mariners. It will also identify those who illegally possess documents and/or licenses. This will assure that only legally-qualified, competent applicants will be certified to serve aboard ship, thereby helping to prevent marine casualties.

Description

The MMLD system consists of three centrally-located data bases:

A. **Mariner profile** - will provide concise biographical sketches.

B. **Activity** - will provide the type license and/or document held by mariners and actions requested (i.e., renewal, upgrade, etc.).

C. **Service history** - will provide mariner discharge listing information and other headquarter's reports.

Each exam center will maintain a pending application, license and document data base. The pending application data base will contain information on the status of applications for licenses or documents. Personnel responsible for entering application information and tracking its progress can obtain vital information on applicants from the mariner profile and service history data bases. This information can then be transferred into the pending application data base.

In addition, descriptive information on a seaman's profile record can be updated, if necessary. The service history data base will be updated at headquarters and will provide query only capabilities to exam center personnel.

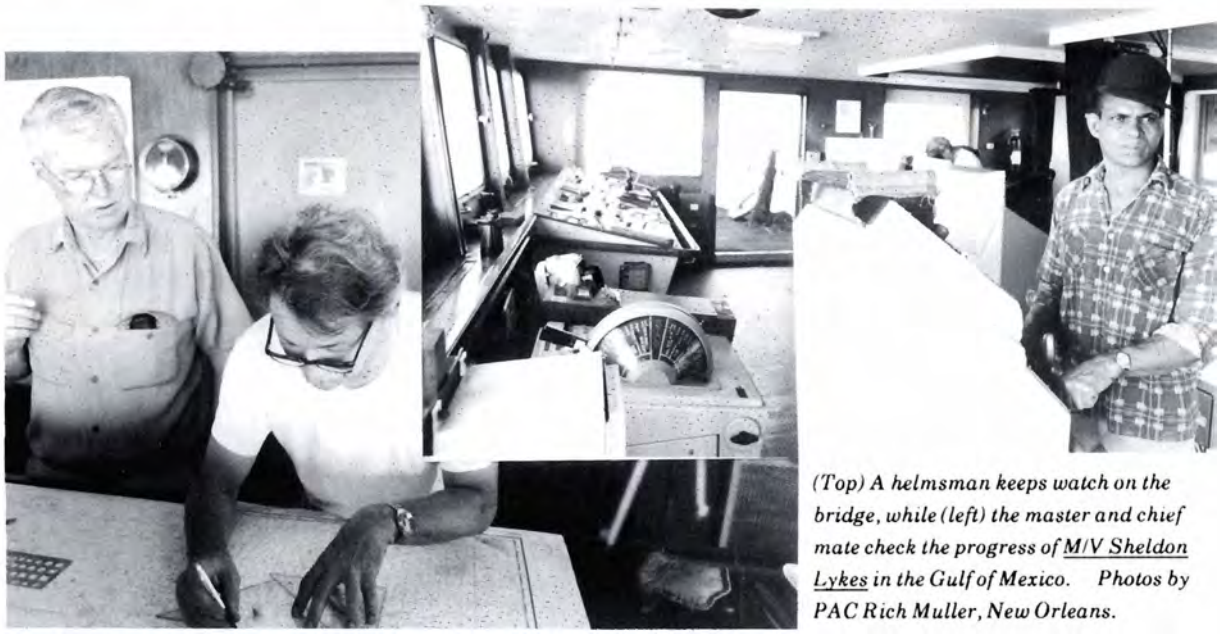
The activity base will be updated after the application process is completed, recording its success or failure. If an application generates a license, document or upgrade, this will be reflected in the mariner profile data base.

The activity data base will provide headquarters with information on the number and types of licenses and documents processed at the individual exam centers.

Summary

The computerization of the 17 regional examination centers should result in far more efficient, productive operations both in the field and in headquarters. Replacing laborious manual operations, the MMLD system will translate into significant savings of valuable time and effort.

Mr. Peter S.A. Palmer is a maritime instructional specialist with the Personnel Qualifications Branch of the Merchant Vessel Personnel Division of the Office of Marine Safety, Security and Environmental Protection. Telephone (202) 267-0226.



(Top) A helmsman keeps watch on the bridge, while (left) the master and chief mate check the progress of M/V Sheldon Lykes in the Gulf of Mexico. Photos by PAC Rich Muller, New Orleans.

Recent vessel manning efforts

Mr. Christopher Young

Background

The United States Code, in general, contains all the basic provisions a vessel operator needs to determine the minimum legal manning requirements for an inspected United States flag ship.

The statutory provisions (particularly in 46 U.S.C. 7101-9102) are very specific concerning compliance with work hour limitations, watches, crew citizenship, and the minimum complement of licensed and unlicensed seamen as reflected on the certificate of inspection.

Additional guidance on manning requirements are in the regulations (46 CFR part 15), which implement the statutory provisions.

However, where existing policy guidance is not sufficient to address a specific situation, or when circumstances arise which suggest that a manning policy should be revised or a new one developed, the Vessel Manning Branch of the Merchant Vessel Personnel Division reviews the policy and prepares recommendations for the program director.

The Vessel Manning Branch has recently been involved in significant efforts to develop or revise manning policies. Here are three of them.

Crew citizenship

In 1987, Congress substantially revised the statutory provisions concerning the citizenship of crew members aboard United States vessels. The requirements were made more restrictive.

- Only United States citizens may serve as masters, chief engineers, radio officers, or officers of navigational or engineering watches on U. S.-documented vessels.
- Unlicensed seamen* must be United States citizens or permanent resident aliens.
- Not more than 25 percent of the total number of unlicensed seamen may be permanent resident aliens.

**Although the term "unlicensed seaman" is not explicitly defined in the citizenship provisions, the Coast Guard has determined that a "seaman" is any individual who is engaged or employed in any capacity on board a vessel.*

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Second Assistant engineer Lisa Streckfus brings steam up to operating levels on the steamship Mississippi Queen. Photo by YN3 Joseph Relle, MSO New Orleans.

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There are some variations and exceptions to these general requirements, and the statute allows for waivers under some circumstances.

The Vessel Manning Branch responds to questions concerning the requirements of crew citizenship, even though citizenship does not directly affect ship safety, except when communication skills are involved. Most questions are concerned with whether particular crew positions are subject to the citizenship restriction.

In addition, the branch is frequently asked whether a United States vessel operating from a foreign port can engage foreign citizens as crew members.

The statute provides that when a vessel on a foreign voyage is deprived of a crew member for any reason, a non-United States citizen may serve in the vacancy until the vessel's return "to a port at which, in the most expeditious manner, a replacement who is a citizen of the United States can be obtained." This language is a revision of a pre-1987 provision, which allowed a non-United States citizen replacement until the vessel's first return to a United States port. The meaning of the term "expeditious" as used in the new provision is at issue in some cases.

The statue also allows for waivers to be granted to offshore supply vessels operating from foreign ports and MODUs operating beyond the United States outer continental shelf. A general waiver has been provided for these situations under 46 CFR 15.720.

The Coast Guard can also grant waivers when it determines that qualified United States citizen seamen are not available. Such waivers are considered on a case by case basis

The branch also interprets citizenship provisions of the Outer Continental Shelf Lands Act Amendments (43 U.S.C. 1356), which require that vessels engaged in offshore activities on the United States outer continental shelf be manned and crewed by United States citizens or permanent resident aliens. This requirement does not apply in certain cases, however, such as when a vessel is owned or controlled by a citizen of another country. Procedures for implementing these provisions are described in 33 CFR 141.

The Vessel Manning Branch often processes requests to determine whether particular vessels are in fact owned or controlled by foreign citizens. Corporate structures and charter agreements often have to be researched for such determinations.

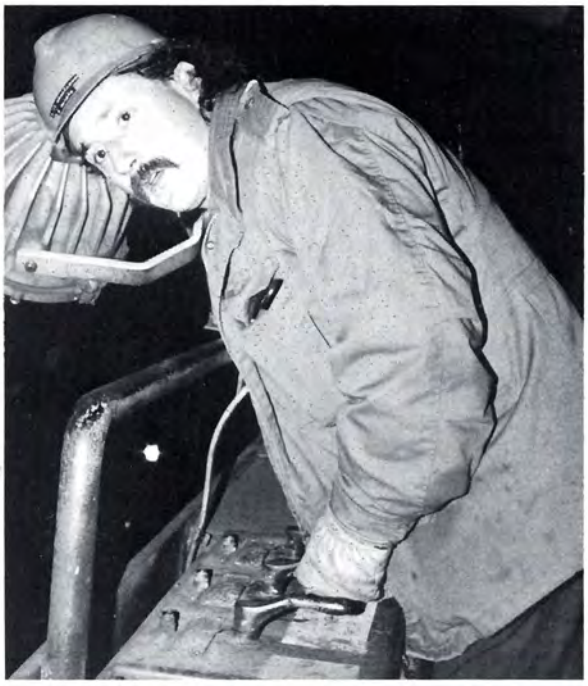
Small passenger vessels

The Coast Guard recently announced revised policy guidance on crew qualifications and manning for small passenger vessels. The revision to the Marine Safety Manual was circulated to officers in charge of marine inspections in November 1990, and a Navigation and Vessel Inspection Circular (NVIC 1-91) was distributed, recommending that deckhands be familiar with certain minimum safety procedures.

The most significant element in the new policy guidance is a correlation between the number of deckhands and the number of passengers carried, and decks to which they have access. These criteria are considered more appropriate and less arbitrary than tonnage correlations.

Implementation of this policy is expected to increase uniformity in manning determinations for small passenger vessels, and provide a sounder basis for ensuring sufficient crews for safe operation.

The branch keeps records on this policy implementation and industry reactions to determine the need for additional guidance.



Able Bodied Seaman Brendan Murphy operates an aft mooring winch on the cargo ship, American Republic.

Photos on this page are courtesy of the Seafarers International Union.

QMED Dave Cameron checks the oil before firing up the engine on Sam Laud, another cargo vessel.

New technology

The Vessel Manning Branch is routinely requested to assess manning implications of the installation on United States ships of new technology, particularly automated and integrated systems requiring little on-board maintenance.

Such assessments involve statutory requirements, international developments [especially at the International Maritime Organization (IMO)], research on fatigue and other human factors, as well as the precedent-setting impact of signaling to the industry that certain arrangements are favorably viewed by the Coast Guard.

Continued on page 18

Crew members handle stern lines of M/V Sheldon Lykes during docking in New Orleans.
Photo by PAC Rich Muller, New Orleans 8th Coast Guard District

Continued from page 17

During the 1980s, the concept of maintenance departments and maintenance personnel emerged as the industry applied new shipboard management approaches differing from traditional deck and engine department organization.

Today, innovations with riding and shoreside maintenance crews must be addressed from a manning context. Also, the rapid automation and integration of bridge equipment could have a dramatic effect on watchstanding duties.

The branch becomes involved when a vessel operator maintains that the ship's manning can be safely reduced because of new technology. Each request is evaluated on its own merits, and against established precedents and implications for future manning policies.

Human element

The roles of fatigue and other human factors in safe vessel operation are constantly taken into account by the Vessel Manning Branch. It provides advisors to the United States delegations to meetings of the IMO Subcommittee on Standards of Training and Watchkeeping, where human factor issues dominate the agenda.

The branch also identifies areas where human factors can be effectively incorporated in determining safe manning for specific ship operations.

Summary

The Vessel Manning Branch routinely applies existing law and policy to practices and proposals which are exceptions to the general rule. Often an issue goes beyond the scope of current guidance, and its resolution can make evident laws or policies which may need revising.

The branch keeps track of all exceptions, studies their implications and ensures that they are considered in the evolution of future manning policies.

Mr. Christopher Young is a transportation specialist in the Vessel Manning Branch of the Merchant Vessel Personnel Division, Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-0229.

Exam comments and protests

Mr. Stewart A. Walker

"There is no correct answer!" "How did they come up with that?" These are not unusual reactions to some merchant marine examination questions. You may have had similar thoughts the last time you took a license exam and came across a question for which all answers seemed incorrect.

There are various reasons why well prepared applicants don't always arrive at the same answer as given on the test. The stress of taking an exam can cause candidates to misread or misinterpret questions. Or the candidate may work a problem by a method which results in an answer between two of those given. In some cases, a question is defective due to human error or technology changes.

When all multiple choice answers on a test question seem wrong, what should you do? First, select what seems to you the best answer, mark it on the sheet and then ask the proctor for a comment-protest form. When filling it out, be sure to put down all your reasons for selecting the answer you did.

If you fail the examination, the proctor will review your comment-protest form to determine if your justification is a comment or a protest.

Protests

Your explanation on the form becomes a protest if it pertains to a question that you got wrong, and if the correct answer to the question would give you a passing score.

If a protest, the form and answer sheet are faxed to Coast Guard headquarters for review by the Merchant Marine Examination Branch. Each protest is reviewed by at least two licensed mariners to determine if the applicant knows the subject.

To evaluate a protest, a reviewer must have complete explanations why a particular answer was selected for a given question. Too many protests include little or no information upon which to base a decision, so be sure and include all the calculations you used to arrive at your answer.

If a satisfactory understanding of the material is demonstrated, the question is credited and the test score raised.

The examination branch reviews all protests immediately and faxes the determinations to the regional exam center, usually within four working hours after reception.

Comments

If your explanation does not fulfill the requirements of a protest, it is treated as a comment and mailed to headquarters.

The examination branch reviews comments to determine if questions are misleading, improperly worded, inappropriate to the test level, outdated or in need of clarification. Faulty questions are corrected and outdated questions are deleted from the examination. This information is passed on to the regional examination centers.

Comments provide valuable information about the quality of test questions and the examination program. They are carefully reviewed and conscientiously adapted to improve test questions.

Mr. Stewart Walker is the chief of the Merchant Marine Examination Branch of the Merchant Vessel Personnel Division, Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-2705.

License examiner MK1 Paul Merritt confers with an applicant at the exam center, MSO, Hampton Roads, VA. Photo by MKC Jim Brickett

License applicant takes test at MSO New Orleans.

Photo by YN3 Joseph Relle.

Examination questions available

The questions used in merchant marine license and document exams can be found in a series of books published by the Coast Guard.

The marine industry raised concerns about the quality of the Coast Guard's examination questions for many years. These books provide the industry and the public an opportunity to review the accuracy and clarity of the questions. Comments are encouraged.

The books contain all of the questions in the examination data bank for a particular area as of the date shown. Questions needing illustrations, diagrams or reference materials require the use of the publications listed under Illustration books - reference materials.

Each volume in the series is titled *Merchant Marine Examination Questions*, subtitled with a descriptive term indicating the contents, and numbered. The book number, subtitle, volume number, Coast Guard commandant publication number (COMDTPUB), publication date, Government Printing Office stock number and price for each volume is listed.

The books may be ordered by telephone and charged to national credit cards by calling (202) 783-3238. They are also available by mail order from the Government Printing Office. Write to:

SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D.C. 20040

The books may also be available at local Government Printing Office sales outlets or at commercial stores selling nautical publications.

Engineering Books

Book 11. *Eng. General Subj. - Vol 1*
COMDTPUB P16721.15 (June 88)
Stk. No. 050-012-00248-7 $12.00

Book 11. *Eng. General Subj. - Vol 2*
COMDTPUB P16721.16 (June 88)
Stk. No. 050-012-00247-9 $13.00

Book 12. *Electricity*
COMDTPUB P16721.17 (June 88)
Stk. No. 050-012-00249-5 $15.00

Book 13. *Steam Plants*
COMDTPUB P16721.18 (June 88)
Stk. No. 050-012-00251-7 $18.00

Book 14. *Motor Plants*
COMDTPUB P16721.19 (June 88)
Stk. No. 050-012-00252-5 $19.00

Book 15. *Engineering Safety*
COMDTPUB P16721.20 (June 88)
Stk. No. 050-012-00268-1 $14.00

Merchant Marine Examination Questions
Deck Books

Book 1. *Rules of the Road*
COMDTPUB P16721.14 (Oct. 89)
Stk. No. 050-012-00282-7 $10.00

Book 2. *Deck General - Vol 1*
COMDTPUB P16721.21 (Oct. 89)
Stk. No. 050-012-00280-1 $12.00

Book 2. *Deck General - Vol 2*
COMDTPUB P16721.22 (Oct. 89)
Stk. No. 050-012-00281-9 $12.00

Book 3. *Navigation General - Vol 1*
COMDTPUB P16721.23 (Oct. 89)
Stk. No. 050-012-00283-5 $11.00

Book 3. *Navigation General - Vol 2*
COMDTPUB P16721.33 (Oct. 89)
Stk. No. 050-012-00277-1 $11.00

Book 4. *Deck Safety - Vol 1*
COMDTPUB P16721.24 (Oct. 89)
Stk. No. 050-012-00278-9 $13.00

Book 4. *Deck Safety - Vol 2*
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Stk. No. 050-012-00279-7 $11.00

Book 5. *Navigation Problems - Vol 1*
COMDTPUB P16721.25A (Sept. 90)
Stk. No. 050-012-00297-5 $16.00

Book 5. *Navigation Problems - Vol 2*
COMDTPUB P16721.26A (Sept. 90)
Stk. No. 050-012-00298-3 $15.00

SUPPLEMENTS

Book 1. *Rules of the Road*
COMDTPUB P16721.14 (March 90)
Stk. No. 050-012-00289-4 $ 3.75

Book 4. *Deck Safety - Vol 1*
COMDTPUB P16721.24 (March 90)
Stk. No. 050-012-00291-6 $ 3.25

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Stk. No. 050-012-00290-8 $12.00

Illustration books - reference materials

Merchant Marine Deck Examination Illustration Book
COMDTPUB P16721.6 (Sept. 88)
Stk. No. 050-012-00266-5 $ 6.00

Merchant Marine Engineering Examination Illustration Book
COMDTPUB P16721.7 (Oct. 87)
Stk. No. 050-012-00238-0 $16.00

Stability Data Reference Book
COMDTPUB P16721.31 (Aug. 89)
Stk. No. 050-012-00271-1 $ 2.50

Operating Manual for Coastal Driller
COMDTPUB P16721.30 (Aug. 89)
Stk. No. 050-012-00272-0 $ 8.50

Operating Manual for Deep Driller
COMDTPUB P16721.29 (Aug. 89)
Stk. No. 050-012-00293-2 $10.00

Guidance Manual For Loading
M.V. Grand Haven
COMDTPUB P16721.32 (Aug. 89)
Stk. No. 050-012-00276-2 $ 2.50

Ship's officer takes bearings from World War II Liberty merchant vessel under convoy to Pacific bases.

World War II merchant mariners

LTJG Mark Williams

Merchant mariners who served during World War II are veterans in every sense of the word. However, they were not recognized as such until very recently.

On January 18, 1988, then Secretary of the Air Force* Edward C. Aldridge ordered that the service of the "American merchant marine in oceangoing service during the period of armed conflict, December 7, 1941, to August 15, 1945," be considered "active duty" under the provisions of Public Law 95-202 for the purpose of all laws administered by the Veteran Administration.

Also included in Secretary Aldridge's decision were civil service crew members aboard United States Army Transport Service and Naval Transportation Service vessels in oceangoing service or foreign waters. The Army and Navy were assigned to determine the eligibility of persons who served in these detachments for veteran status.

**The secretary of the Air Force was originally petitioned in 1979 by a civilian group known as the Woman's Air Forces Service Pilots (WASPs) for recognition as veterans of World War II. The Air Force granted this request, recognizing them as veterans with all due rights and privileges.*

Subsequent groups applying for veterans' status have also been referred to the Air Force for an initial disposition. Their petitions are examined by the Department of Defense Civilian/ Military Review Board, chaired by the Air Force with representation from all the armed services. After a decision to grant a petition, the service most closely allied to the particular group then processes and issues the necessary documents.

Eligibility

The Coast Guard is responsible for determining the eligibility of all merchant mariners who sailed on ocean-going or coastal voyages during the period of armed conflict.

Approximately 250,000 people sailed in various capacities as merchant mariners during the war, and could be eligible for benefits administered by the Veterans Administration.

To be eligible, mariners must have served satisfactorily for at least one day on a voyage for partial benefits or on voyages totaling at least 180-days for full veterans' benefits. (Applicants may be merchant mariners, dependents or survivors of mariners.

Applicants

Since the program began in 1988, more than 80,000 applications for veteran status have been received by the Merchant Marine Veterans Branch of the Merchant Vessel Personnel Division. This branch was specially created to handle the application process.

Of those applications, more than 69,000 mariners have been determined eligible and have had Release from Active Duty Form DD-214 issued. In addition, more than 1,500 applications have been referred to the Army Transportation Corps for determination.

Procedure

For each application, the mariner's seaman's jacket must be requested from the Federal Records Center. Sometimes this request must be made more than five times before the jacket is located.

Some records were filed improperly when they were sent to the center years ago. In many cases, additional documentation is needed from the mariner or applicant to make a determination.

Once the records are received, the material must be thoroughly reviewed. Voyages of record during the qualifying period are verified, and the information is entered into a data base.

All data is reviewed and proofread three times before issuing a form DD-214. This is done to reduce errors that may cause unnecessary delays in obtaining benefits.

Staff

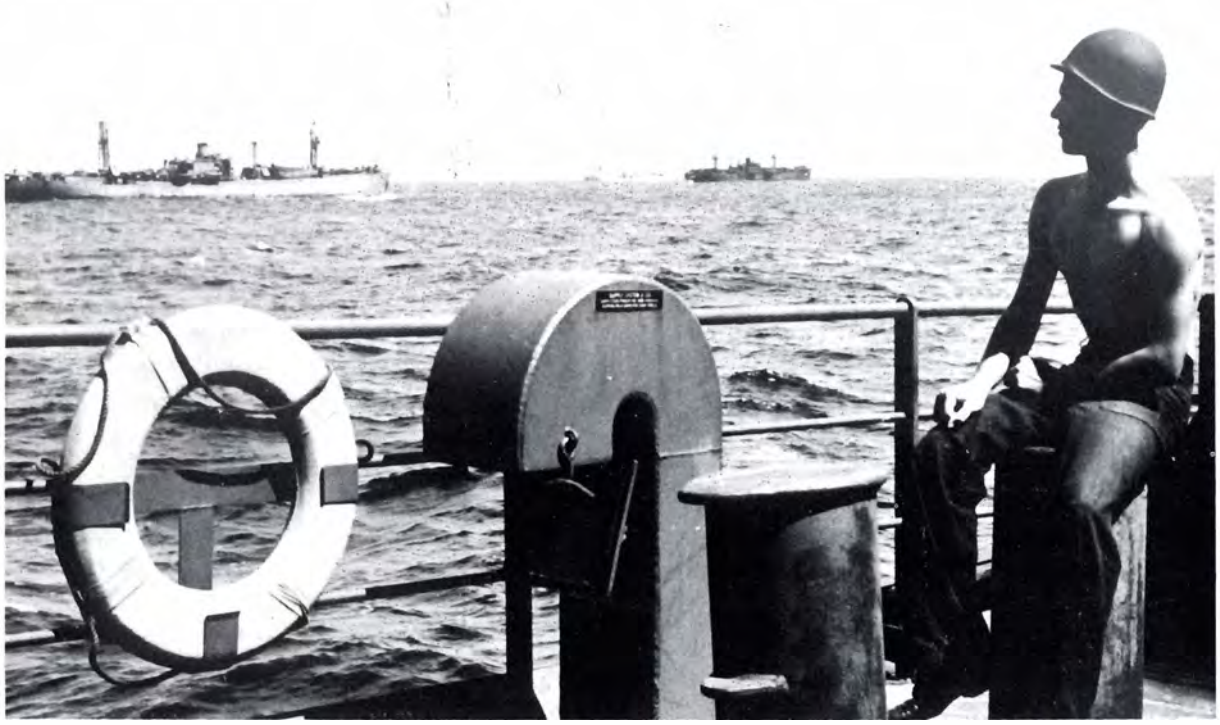
At the height of the operation, up to 80 employees were required to handle the workload. In all, nearly 300 individuals have helped World War II merchant mariners obtain veteran status. The branch currently has an authorized strength of 22 military and civilian personnel.

The staff of the Merchant Marine Veterans Branch derives great satisfaction knowing they are helping brave mariners who played such an vital role in attaining victory in World War II.

LTJG Mark Williams is the chief of the Merchant Marine Veterans Branch of the Merchant Vessel Personnel Division of the Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-2641

Seaman takes five to watch Pacific-bound convoy of merchant vessels during World War II.

Photos are courtesy of the Maritime Administration.



A model merchant mariner

Mr. Michael B. Bratten

CAPT George E. McCarthy III as a cadet at the Merchant Marine Academy in 1942.

A World War II merchant marine veteran and a model mariner, CAPT George E. McCarthy III is now an outstanding member of the Merchant Marine Veterans' Branch.

Having volunteered his services in 1988 when the branch was created, CAPT McCarthy has helped process hundreds of applications for veteran's status, has reviewed thousands of sailing records and has contributed a wealth of knowledge about the role of the merchant mariner during World War II. His wholehearted efforts are all free of charge.

Background

CAPT McCarthy was appointed to the United States Merchant Marine Academy, Kings Point, N. Y., in 1942. Upon graduation the next year, he became a licensed deck officer and sailed in all theaters of operation during the war.

Among his most memorable voyages was on a convoy from Port Said, Egypt, to Malta in November 1942. For five days and nights, the convoy was attacked from air and sea. Only four ships survived, including the one he was on.

Another voyage during the winter of 1944-45 was destined for Murmansk, Russia. CAPT McCarthy recalls plane and submarine attacks in numbing cold and 24-hour darkness. Everyone on board knew that if they made it to Murmansk, they still had the return voyage to worry about.

Following the war, CAPT McCarthy served as chief officer and captain on cargo and passenger vessels for the Moore-McCormack Lines

After retiring his sea legs, CAPT. McCarthy was named maritime attache to the American embassy in Buenos Aires, Argentina, by the Maritime Administration in 1957. After five years, he was selected for the same position at the American embassy in Paris, France, where he remained for 11 years.

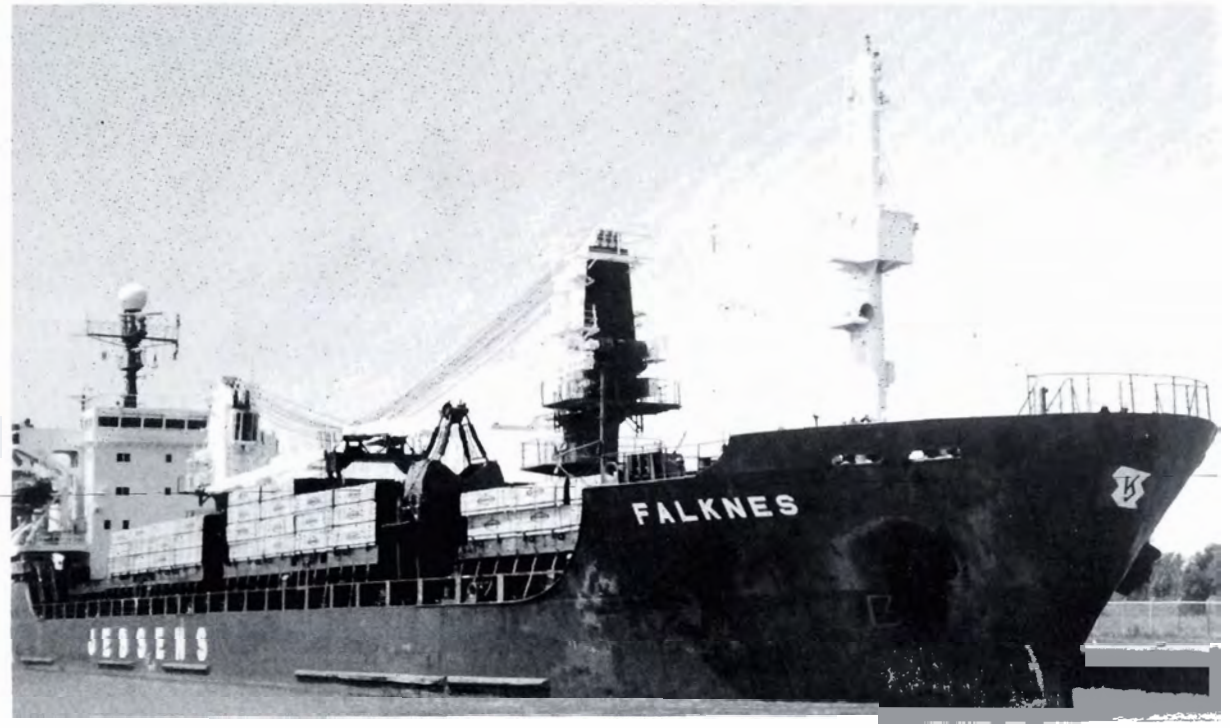
CAPT McCarthy became a transportation specialist for the Maritime Administration in Washington, D.C. in 1972 and retired from that position in 1987. He since has devoted much time and effort toward determining veteran's status for World War II merchant mariners.

Current efforts

A regional vice president of the King's Point alumni association and a member of the Coast Guard Auxiliary, CAPT McCarthy is currently working toward establishing veteran status for Merchant Marine Academy cadets who were killed or missing in action during World War II.

His tireless dedication and valuable knowledge have solved numerous problems which could have delayed many merchant mariners in receiving the credit they deserve.

Mr. Michael B. Bratten is an examiner with the Merchant Marine Veterans Branch of the Merchant Vessel Personnel Division of the Office of Marine Safety Security and Environmental Protection. Telephone: (202) 267-0573.



An ocean merchant vessel navigates the St. Lawrence River. *(Photo courtesy of St. Lawrence Seaway Development Corp.)*

Merchant vessel pilotage

Mr. John Hartke

Generally, the pilotage of foreign vessels and United States vessels under register (foreign trade) are under the authority of the individual states, and United States-enrolled vessels are under federal authority. An exception to this rule is pilotage on the Great Lakes.

In 1960, Congress passed the Great Lakes Pilotage Act (now codified as 46 U.S.C. chapter 93), which preempted the states and placed the regulation of foreign vessels and United States vessels under register, operating on the Great Lakes, under federal authority.

This legislation was enacted to ensure safety of large vessels navigating the Great Lakes after the opening of the St. Lawrence Seaway. It could create havoc if the eight states bordering the Great Lakes were to make their own individual and possibly conflicting pilotage laws.

In addition, dealings with a foreign national government, such as Canada, are reserved for the federal government.

In 1961, the United States and Canada established a memorandum of arrangements to coordinate the implementation of their respective pilotage laws.

The latest agreement in 1977 coordinated the provisions of pilotage services and, in particular, the distribution of work between pilots of the two nationalities in each of the three Great Lakes pilotage districts.

The Secretary of Transportation delegated the administration of Great Lakes pilotage to the Coast Guard, but retained the authority to enter into agreements with Canada.

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Regulation

Since 1968, oversight of Great Lakes pilotage was conducted by the Ninth Coast Guard District in Cleveland, Ohio. In November 1990, this responsibility was transferred to Coast Guard headquarters under a newly created Merchant Vessel Pilotage Branch of the Merchant Vessel Personnel Division.

With regard to national pilotage issues, the branch's responsibilities include the licensing of pilots and manning of vessels by pilots. The pilot licensing regulations are found under 46 CFR 10.701 through 10.713. The pilot manning regulations are under 46 CFR 15.812.

Issues include questions of which vessels are required to have a pilot, where they are required to have a pilot, and the qualifications necessary to be a pilot.

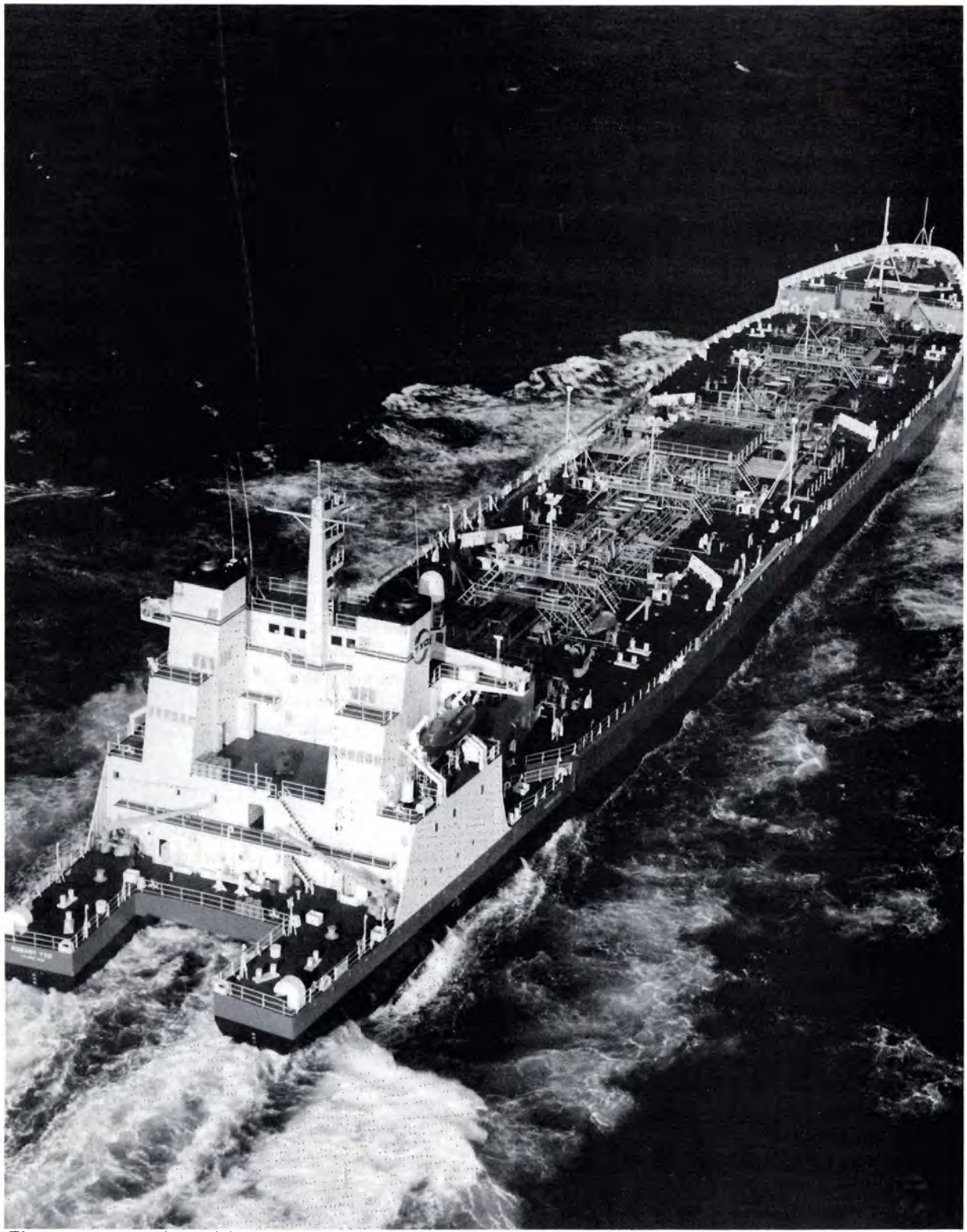
The recently published Navigation and Vessel Inspection Circular 3-91 interprets various issues regarding pilots and pilotage regulations.

The Coast Guard's regulation of registered pilots on the Great Lakes is extensive. It includes registering pilots, establishing pilotage rates, authorizing pilotage pools, prescribing regulations for operation and administration of the pools, establishing a uniform system of accounts, and performing audits and inspections. The Great Lakes pilotage regulations are under 46 CFR parts 401-404.

Two significant Great Lakes pilotage documents are the Department of Transportation Great Lakes Pilotage Study published on December 7, 1988, and the Department of Transportation Inspector General Audit Report dated December 14, 1990.

Mr. John Hartke is the chief of the Merchant Vessel Pilotage Branch of the Merchant Vessel Personnel Division of the Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-0217.

Ocean ship transits Eisenhower Lock near Messena, New York. *(Photo courtesy of St. Lawrence Seaway Development Corp.)*



The ocean-going tank vessel Oxy Trader.

Chemical cargo lists

LCDR John G. Cline

Many barge and tank vessel operators who ship dangerous chemicals in bulk find federal regulations confusing to follow.

Each hazardous cargo listed in 46 Code of Federal Regulations (CFR), subchapter O, parts 151 (tank barges) and 153 (tank ships), has its own set of carriage requirements. It can be very tedious going through the cargo tables to determine each and every cargo a vessel is equipped to carry. The Coast Guard has made this task much easier with a computer.

Cargo tanks

The Coast Guard's Marine Safety Center in Washington D.C. reviews all tank vessels for compliance with the CFR. Recently, the center's cargo division developed a computer program listing the cargoes a ship or barge may carry, based on its tank characteristics.

To obtain a list of permissible cargoes, a tank vessel operator must first provide the safety center with information on the cargo-carrying system for each tank group on the vessel. Tanks with similar characteristics form tank groups. A chemical tank vessel may have many different groups, while most tank barges only have one.

Loading form

The safety center designed a loading form listing tank group characteristics to help operators assemble cargo- carrying data. Various versions of the form address the different barge and tank vessel regulations.

The Tank Group Characteristics Loading Form is easy to fill out. It requests specific information on construction materials, venting, gauging and other characteristics of a containment system which determine permissible cargoes.

The operator submits this data to the safety center, requesting a prospective list of cargoes. A cargo division engineer reviews the form, comparing it with data on file concerning the vessel before entering it into the computer. Any discrepancies between the information on file and that provided by the operator are resolved by the local Officer in Charge, Marine Inspection (OCMI).

Computer action

The main portion of the safety center's computer program consists of a data base of all the cargoes and their specific carriage requirements found in 46 CFR table 151.05 and 46 CFR 153, table 1, as appropriate. The computer cross checks the tank group characteristics supplied by the operator against the cargo data base, and generates a list of permissible cargoes.

New cargoes

If an operator wishes to carry a cargo not on the list, the ship's containment system must be altered to meet the carriage requirements of that cargo. If it has never been carried in bulk before, the operator must submit a Material Safety Data Sheet or Coast Guard form 4355 to Commandant (G-MTH-1), who determines the necessary carriage requirements.

Cargo lists

The operator receives the list of permissible cargoes along with instructions of how to amend the cargo authority on the vessel's Certificate of Inspection. The list is provided as part of a Plan Review Information Sheet for a barge or a List of Authorized Cargoes for a tankship.

The operator must have an OCMI verify that the characteristics on the appropriate cargo documents are correct and specify which cargoes from the list are to go on the Certificate of Inspection. If everything checks out, the OCMI will amend the certificate to include the requested cargoes.

Subsequent vessel alterations should be logged on a new survey form and submitted to the safety center for an update of permissible cargoes.

~~M/T Stolt Emerald~~, a 38,720-dwt parcel tanker, has 58 segregated tanks. Photo courtesy of Stolt-Nielsen, Inc.

Successful process

This process has proven to be successful since it was started more than a year ago. The response from the marine industry has been very positive.

It is a significant improvement over past practices, when vessel operators were required to request authority to carry specific cargoes on a case-by-case basis. Cargo lists and certificates were constantly being revised to accommodate new cargoes, often hastily to permit immediate loading.

Now, in one step, the authority can be upgraded to carry all permissible cargoes, eliminating the need for last-minute updates of the Certificate of Inspection. The Tank Group Characteristics Loading Form saves valuable time and effort for both the Marine Safety Center and vessel operators.

Copies of the form and instructions are available free of charge from the Coast Guard Marine Safety Center, Cargo Division, Room 6324, 400 Seventh Street S.W., Washington, D.C. 20590-0001.

LCDR John G. Cline is a staff engineer in the MARPOL Annex II and Foreign Tank Vessel Branch of the Cargo Division of the Marine Safety Center. Telephone: (202) 366-6441.

Nautical queries — *September-October, 1991*

The following items are examples of questions included in the third assistant engineer through chief engineer examinations and the third mate through master examinations.

Engineer

1. If while you are inspecting main bearings on a diesel engine, you found impregnated dirt and scratches in the bearing surface. You would suspect that _____.

A. the bearing had been overheated.
B. water was present in the oil.
C. the lube oil was not being properly filtered.
D. the maximum allowable bearing pressure had been exceeded.

2. What precautions are necessary with oxygen-acetylene welding equipment?

A. Bottles should be labeled air and gas.
B. Cylinders should not be exposed to cold temperatures.
C. Oxygen regulators and valves should always be coated with a light film of oil.
D. Cylinders should always be supported so that they cannot tip over.

3. Gasket leakage around boiler handholes may be caused by _____

A. improper positioning of the gasket.
B. pitted seating surfaces.
C. loose dogs.
D. any of the above.

4. If the governor on a main propulsion diesel engine works irregularly with a jerking motion, a possible cause can be _____

A. a sticking fuel control linkage.
B. a malfunctioning overload cam.
C. an unlocked overspeed trip.
D. floating valves.

5. An automatic solenoid dump valve will trip if an evaporator produces distillate with sale content exceeding ___grains per gallon.

A. .05
B. .15
C. .20
D. .25

6. People should be protected from the rotating parts of machinery by _____

A. vents.
B. bright lights.
C. reflective tape.
D. guards.

7. If a steaming oiler does not have enough air for proper combustion, the _____

A. boiler will pant and rumble.
B. fires will hiss and sputter.
C. boiler will smoke white.
D. fires will be too hot.

8. Engine hunt may be caused by _____

A. excessive speed droop.
B. insufficient speed droop.
C. excessive sensitivity.
D. low governor power.

9. Coast Guard regulations (46 CFR 97) require that storage batteries for emergency lighting and power systems be tested at least once each _____.

A. six-month period that the vessel is navigated and noted in the official log book.
B. bi-weekly period to verify the battery condition and noted in the rough log book.
C. quarterly period that the vessel is navigated and noted in the rough log book.
D. weekly to verify the battery condition and noted in the official log book.

Deck

1. Which of the following nautical charts is intended for coastwise navigation outside of outlying reefs and shoals?

A. Approach charts.
B. General charts.
C. Sailing charts.
D. Coast charts.

2. The navigator is concerned with three systems of coordinates. Which system is not of major concern?

A. Terrestrial.
B. Ecliptic.
C. Celestial horizon.
D. Celestial equator.

3. Inland only -- Which statement is true concerning the fog signal of a vessel 25 meters long anchored in a "special anchorage area" approved by the secretary of Transportation?

A. The vessel is not required to sound a fog signal.
B. The vessel shall ring a bell for five seconds every minute.
C. The vessel shall sound one blast of the foghorn every two minutes.
D. The vessel shall sound three blasts on the whistle every two minutes.

4. Both international and inland -- The term "restricted visibility" as used in the rules refers _____.

A. only to fog.
B. only to visibility of less than 1/2 mile.
C. to visibility where you cannot see shore.
D. to any condition where visibility is restricted.

5. Both international and inland -- At night, a power-driven vessel less than 12 meters in length may, instead of the normal running lights, show sidelights and _____.

A. one white light.
B. one yellow light.
C. one flashing white light.
D. one flashing yellow light.

6. Both international and inland -- While underway in fog you hear a rapid ringing of a bell ahead. This bell indicates a

A. vessel at anchor.
B. vessel in distress.
C. sailboat underway.
D. vessel backing out of a berth.

7. Both international and inland -- During the day, a vessel with a tow over 200 meters in length will show _____.

A. a black ball.
B. a diamond shape.
C. two cones, points together.
D. one cone, point upward.

8. Both international and inland -- Which vessel sounds the same fog signal when under way or at anchor?

A. A sailing vessel.
B. A vessel restricted in its ability to maneuver.
C. A vessel constrained by its draft.
D. A vessel not under command.

9. Both international and inland -- While underway in fog, you hear a vessel ahead sound two blasts on the whistle. You should _____.

A. sound two blasts and change course to the left.
B. sound whistle signals only if you change course.
C. sound only fog signals until the other vessel is sighted.
D. not sound any whistle signals until the other vessel is sighted.

Answers

Engineer

1-C, 2-D, 3-D, 4-A, 5-D, 6-D, 7-A, 8-D, 9-A

Deck

1-B, 2-B, 3-B, 4-D, 5-A, 6-A, 7-B, 8-B, 9-C

If you have any questions concerning "Nautical Queries," please contact U.S. Coast Guard (G-MVP-5), 2100 Second St., S.W., Washington, D.C. 20593-0001. Telephone (202) 267-2705.

Chemical of the month *2/C Eric P. Kowack*

Acetonitrile

Acetonitrile or methyl cyanide is very useful as a highly polar solvent. It is used as a solvent for inorganic salts or in nonaqueous titrations.

Highly purified acetonitrile is an outstanding solvent in high-pressure liquid chromatography in the detections of pesticides.

Its major industrial use is to separate butadiene from four-carbon alkanes by extractive distillation.

Acetonitrile is commercially produced in the United States as a by-product of the manufacturing of acrylonitrile by ammoxidating propylene. Because the two nitriles differ in boiling points by only 4.2°C, acrylonitrile is a prominent impurity found in acetonitrile.

Hazards

Methyl cyanide is very common in today's society, thus it is most important to be aware of its hazards.

Avoid breathing vapors. High concentrations will cause rapid death. It has insufficient warning properties to make people aware of its presence and keep them away from its lethal vapors.

Overexposure also causes extreme skin and eye irritations.

Acetonitrile is highly toxic by ingestion. The chemical is so dangerous that the products of its decomposition are also highly toxic.

Precautions

In case of contact with acetonitrile, immediately flush the skin or eyes with running water for at least 15 minutes. Remove and isolate any contaminated clothing.

Move anyone who inhales acetonitrile vapors to fresh air and call for emergency medical care. If the victim is not breathing, give artificial respiration until help arrives.

Spills

The first step in controlling a spill or leak is to remove all sources of ignition from the hazard area. You should then try to stop the leak, if you can do so without risk.

To reduce vapors, use a water spray over the leakage. For a small spill, take it up with sand or some other noncombustible absorbent material, and then flush the area with water. For a large spill, dike the liquid far ahead to isolate it for later disposal.

Be sure to keep unnecessary people away, stay upwind of the spill and keep out of low areas. In the event of a large spill, call the National Response Center at 1-800-424-8802 immediately.

Fire

Extinguish fires involving acetonitrile with dry chemical, "alcohol" foam or CO_2. Water may be used to disperse vapors and protect firefighters, or to flush spills away from ignition sources.

If a tank is involved in fire, isolate the area for one-half mile in all directions. Self-contained breathing apparatus and full protective clothing should be worn at all times. If possible, withdraw from the area and let the fire burn. For emergency assistance, **call CHEMTREC at 1-800-424-9300.**

Storage

Acetonitrile is generally stable, but, obviously, it is a potentially dangerous compound. Therefore, it is stored and shipped in sealed containers, and is regulated by the Coast Guard as a *Subchapter O commodity for shipment under Title 46* of the Code of Federal Regulations.

Outside or detached storage of this chemical is preferable. Inside storage should be in a standard flammable liquids storage room.

Acetonitrile

Chemical name:	Acetonitrile
Formula:	C_2H_3N
Synonyms:	Methyl cyanide and ethanenitrile
Chemical family:	Nitrile
Physical description:	Colorless liquid, aromatic odor

Physical properties:		
	Boiling point:	81.1°C (178°F)
	Freezing point:	- 45.0°C (-49.0°F)
	Vapor pressure (at 20°C):	77 mm Hg
	(at 100°F):	3.15 psia
Threshold limit value:		
	Time weighted average:	40 ppm (67 mg/m)
	Short-term exposure limit:	60 ppm (101 mg/m)
Flammability limits in air:		
	Lower flammability limit:	4.4%
	Higher flammability limit:	16.0%
Combustion properties:		
	Flashpoint (c. c.):	42°F (5.5°C)
	Autoignition temperature:	975°F (524°C)
Densities:		
	Vapor (air = 1):	1.42
	Specific gravity (at 20°C):	0.788
	Density (at 70°F):	0.787
Identifiers:		
	IMO class:	6.1
	U.N. number:	1648
	CHRIS Code:	ATN
	CAS Registry No.:	75-05-8
	Cargo compatibility group:	37 (nitriles)
NFPA:		
	Health hazard:	2
	Flammability:	3
	Reactivity:	0

Eric P. Kowack was a second class cadet at the Coast Guard Academy when this article was written as a special chemistry project for LCDR T. Chuba.

Notice

CGD 91-026, Central Pacific Loran closure, (June 3).

ACTION: Notice; request for comments.

The Coast Guard proposed early closure of the Central Pacific Loran-C Chain at the end of calendar year 1992, vice operation through 1994 as currently planned. Continued operation of the Chain is not economically justified. Early closure of this Chain will save the Coast Guard the cost of operating it for two years, which amounts to an estimated five to six million dollars.

Dates: Comments should have been received by August 2, 1991.

For further information, contact: CDR Richard J. Armstrong, chief, Radio Aids Management Branch (G-NRN-1), room 1413, Coast Guard, 2100 Second St., S.W., Washington, D.C. 20593-0001. Telephone: (202) 267-0990).

Proposed rule

Reservists Education; Veterans' Benefits Programs Improvement Act and Montgomery GI Bill (38 CFR Part 21) RIN 2900-AD89m (June 12).

ACTION: Proposed regulations.

The Veterans' Benefits and Programs Improvement Act of 1988 contains several provisions which affect the Montgomery GI Bill -- Selected Reserve. These include liberalizing the standards for determining extension to a reservist's basic period of eligibility. A few of the amended regulations needed to implement this law were proposed in the *Federal Register* dated November 17, 1989, on pages 47785 to 47790. This proposal will acquaint the public with the way in which the Department of Veterans Affairs will administer the remaining provisions of law.

Date: Comments must have been received by July 12, 1991. It is proposed to make the revisions to these regulations and the new regulations contained in this proposal effective on the same date as the provisions of law on which they are based. Consequently, it is proposed to make the revisions to 38 CFR 21.7520(b)(14) and 21.7639(b) retroactively effective on June 1, 1989. It is proposed to make the revisions to all other regulations retroactively effective on November 18, 1988.

For further information, contact: Ms. June C. Schaeffer, assistant director for Policy and Program Admin., Education Service, Veterans Benefits Admin. Telephone: (202) 233-2092.

Proposed rule

CGD 91-002, User fees for marine licensing, certification of registry and merchant mariner documentation (33 CFR part 1: 46 CFR parts 10 and 12) RIN 2115-AD72 (June 20).

ACTION: Notice of proposed rulemaking.

In response to recent statutory requirements, the Coast Guard proposes to establish user fees for services related to merchant marine licenses, documents and certificates of registry. The fees in this proposal are based on the way the Coast Guard now conducts licensing and documentation activities, and the costs of these services.

Date: Comments must have been received by August 5, 1991.

The executive secretary maintains the public docket for this rulemaking. Comments will become part of this docket and be available for inspection or copying at room 3406, Coast Guard.

For further information, contact: LT J.K. Gillespie, Planning Division (G-MP-1), Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-6923.

Final rule

CGD 78-174b, Approval of inflatable lifejackets (46 CFR part 160) RIN 2115-AC16 (June 27).

ACTION: Adoption of interim final rule as final.

On May 29, 1985, the Coast Guard published a notice of proposed rulemaking in the *Federal Register*, which proposed structural and performance standards and procedures for approval of inflatable lifejackets, as well as requirements for associated manuals, servicing programs and shore-side service facilities.

On December 5, 1989, the Coast Guard published an interim final rule based on these proposals. Because the interim final rule contained several provisions which were not in the notice of proposed rulemaking, the Coast Guard extended an opportunity for comment on these sections. This final rule adopts the interim final rule with only minor changes.

Effective date: July 29, 1991.

For further information, contact: Mr.Samuel Wehr, Office of Marine Safety Security and Environmental Protection, (G-MVI-3/14), Telephone: (202) 267-1444.

Final rule

CGD 90-0671, Recreational vessel fees (33 CFR Part 1) RIN 2115-AD67 (July 1).

ACTION: Final rule.

As required by the Omnibus Budget Reconciliation Act of 1990, this final rule establishes an annual fee for recreational vessels operated on navigable waters of the United States where the Coast Guard has a presence. The fee requires recreational boaters to share in the costs of Coast Guard programs from which they benefit, including search and rescue, boating safety, and aids to navigation, but for which no direct user fee may be charged.

Effective date: July 31, 1991.

For further information, contact: Mr. Carlton Perry, Auxiliary, Boating and Consumer Affairs Division. Telephone: (202) 267-0979.

Final rule

CGD 90-014, Chemical Drug Testing Programs for Commercial Vessel Personnel (46 CFR part 16) RIN 2115-AC45 (July 8)

ACTION: Final rule

This rule establishes random chemical drug testing requirements for all crewmembers who serve in positions which affect the safe operation of a commercial vessel. The Coast Guard believes that random chemical testing for dangerous drugs is necessary for the overall effectiveness of any program to discourage drug use by commercial vessel personnel, and thereby enhance the safety of the marine transportation industry.

These regulations reduce the number of crewmembers subject to random testing under the maritime transportation drug testing program, and remove industrial personnel on industrial vessels from the requirements for drug testing.

Effective date: October 1, 1991.

For further information, contact: LCDR Thomas Murphy, Marine Investigation Division, Office of Marine Safety, Security and Environmental Protection (G-MMI-2). Telephone: (202) 267-1421.

Final rule

CGD 90-032, Inland navigation rules: Annex V: pilot rules (33 CFR part 88) RIN 2115-AD58 (July 22).

ACTION: Final rule.

The Coast Guard is designating light signals to identify vessels engaged in public safety activities. These regulations will enhance navigation safety by making these vessels easier to distinguish from other vessels.

Effective date: August 21, 1991

For further information, contact: Mr. Harry C. Robertson, Short Range Aids to Navigation Division (G-NSR). Telephone: (202) 267-0357.

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Notice

CGD 91-010, Oil Pollution Act of 1990 -- Designating areas for area committees (July 22).

ACTION: Notice of intent.

The Coast Guard is providing advance notice of how it will designate some of the areas for which area committees are required to conduct regional oil spill contingency planning under the Oil Pollution Act of 1990.

Other areas will be designated by the Environmental Protection Agency in a separate notice. This division of responsibility reflects the working arrangements between the two agencies under existing national and regional oil spill contingency planning. Early notice will permit planning to begin. The Coast Guard will publish a notice designating the areas when the authority to do so is delegated to the Coast Guard.

For further information, contact: Mr. Robert M. Gauvin, Project Manager, Oil Pollution Act Staff, Coast Guard. Telephone: (202) 267-6226.

Final rule

CGD 88-032, Incorporation and adoption of industry standards (33 CFR parts 127 and 154; 46 CFR parts 25, 32, 34, 50, 52, 53, 54, 55, 56, 57, 58, 59, 71, 76, 91, 92, 95, 107, 108, 150, 153, 162, 163, 169, 170, 174, 182, 189, 190 and 193) RIN 2115-AD05 (July 29).

ACTION: Final rule.

The Coast Guard is amending its regulations to adopt industry standards and specifications. These changes eliminate the submission of technical information for affected components, and reduce the overall cost and burden in staff hours and paperwork for both industry and the government, while providing a better method for ensuring that the affected components comply with Coast Guard regulations.

Effective date: August 28, 1991.

For further information, contact: Mr. Stephen R. Irvin, Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-2206.

Proposed rule

CGD 90-020, National vessel traffic services regulations (33 CFR part 161) RIN 2115-AD56 (August 1).

ACTION: Notice of proposed rulemaking.

The Oil Pollution Act of 1990 directed the Coast Guard to require appropriate vessels to participate in vessel traffic service (VTS) systems. To accomplish this, the Coast Guard proposed requiring participation for vessels using the San Francisco, Houston/Galveston and Louisville VTS systems, which are currently operating on a voluntary basis.

The Coast Guard also proposes to simplify existing VTS regulations by promulgating standard national vessel traffic management and reporting procedures. The effect of this rulemaking would result in consolidated national VTS regulations, supplemented as necessary with local VTS rules. The rules for the Juan de Fuca Cooperative Vessel Management System and Mississippi River would be independent and not a component of the national VTS rules, but are included in this part because of their vessel traffic management functions

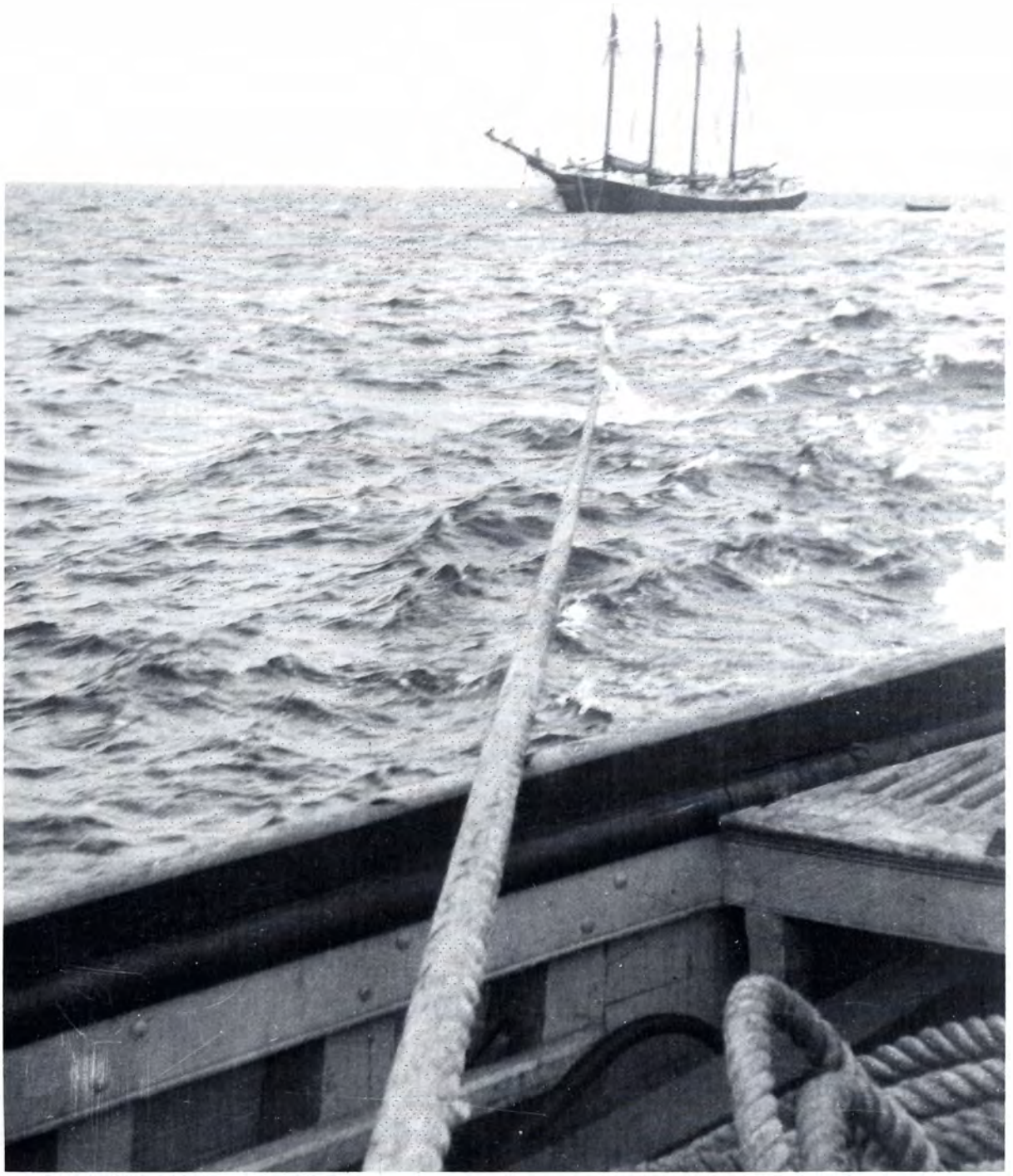
These proposed rules are intended to enhance safe vessel movement by reducing the potential for groundings and collisions, and to minimize the risk of environmental harm resulting from collisions and groundings.

Date: Comments must be received on or before September 20, 1991.

Addresses: Comments may be mailed to the executive secretary, Marine Safety Council (G-LRA-2), Room 3406, Coast Guard headquarters, 2100 Second St.,S.W., Washington, D.C. 20593-0001, or may be delivered to room 3406 at the above address between 8 a.m. and 3 p.m., Monday through Friday, except federal holidays. Telephone: (202) 267-1477.

The executive secretary maintains the public docket for this rulemaking. Comments will become part of this docket and will be available for inspection or copying at room 3406.

For further information, contact: Mr. Bruce Riley, project manager, Navigation Safety Systems Special Projects Staff. Telephone: (202) 267-0412.



The four-masted schooner, Gladys M. Taylor, was grounded on shoals in Nantucket Sound, Cape Cod, Massachusetts, on November 5, 1921. Bob Beattie, a crewman aboard the tug, Guardsman, made this photograph as the vessel was pulled free of the sand bar the following day.

Photo courtesy of William P. Quinn, Orleans, Massachusetts.