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DSR

**DECK STUDY RECOMMENDATIONS**  
**[All previous deck study recommendations are cancelled.]**

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**OUR STUDY MATERIAL RECOMMENDATIONS**

Our recommendations are based upon:

A knowledge of what is (and is not) contained in the chapters we assembled in our textbooks.

Locating information in other books that we distribute.

Questions and answers from the Coast Guard question bank first made public under the Freedom of Information Act (FOIA) at our request beginning in 1988. These questions outline the depth of knowledge that the Coast Guard uses in their examinations. Unfortunately, the Coast Guard removed all 25,000+ questions and answers (Q&A) from their database on July 12, 2010 ó an action that we formally appealed because it violates the appeal granted us in 1988. The Q&A were restored to the internet in 2013 although the status of many illustrations used in testing remains in limbo.

Reports from instructors and other credential applicants candidates.

Discussions with Coast Guard Regional Exam Centers (REC) and information derived from Federal Advisory Committee meetings.

These recommendations and guidance represent our *opinion* and are subject to change based on new information. We appreciate any help our readers can provide based on their experience to improve the quality of this information

by reporting any discrepancies.

We understand that many of our recommendations involve considerable expense. We encourage you to ask your public library to acquire the basic books required by all persons in the commercial marine industry. Learn how to use all the reference books that are used on your vessel. Share your information with other mariners, but *beware of outdated information* while preparing for an exam! Obsolete material can mislead you in a number of ways.

**Individual Chapters Fill Knowledge Gaps**

Marine Education Textbooks (MET) has been in business for over 40 years catering to the needs of “limited tonnage” merchant mariners. We developed textbooks made up of many “stand alone” chapters. Many “limited-tonnage” mariners who decide to take an exam-prep course (regardless of whether it was Coast Guard-approved or not) may come out of that course with a sketchy or incomplete knowledge of the subject matter. If there is a subject area you are weak in, we believe that our chapter dealing with that *exam topic* would be useful to you in either passing an exam or in your career afloat. Individual chapters can fill in gaps in your knowledge that you may need to function properly even if you already possess the credential that allows you to serve aboard a vessel. Some mariners discover too late that many “exam modules” are composed of a number of topics they neglected to study in depth.

**Disclaimer**

Marine Education Textbooks (MET) publishes and distributes study material to assist qualified candidates obtain certain Coast Guard merchant mariner credentials (MMC). MET acknowledges the use of information derived from various government publications. However, we specifically refuse to accept responsibility for errors, omissions, or actions resulting from the use of our publications beyond our obligation to make necessary editorial corrections.

We cover many exam topics in the individual chapters of our Limited Master, Mate and Operator, the Towing Vessel Officers Guide, Workboat Engineer, Able Seaman and Lifeboatman and other textbooks. **Individual chapters are available on request to fit your individual needs as outlined below.**

We present material that pertains to questions that can be expected to appear on Coast Guard credentialing exams and accomplish this by presenting complete, timely, adequate, and accurate background information.

## THE NEW TERMINOLOGY

The old Merchant Mariner's Document (MMD) or z-card served two purposes. With its picture identification, it served as proof of identification and provided evidence of a mariner's qualifications to serve in various (unlicensed) shipboard positions. These unlicensed positions are now known as *ratings*.

Each mariner serving on a vessel of **at least 100 gross tons**, except those vessels specifically exempted by statute such as many vessels on rivers and inland waters, has to hold a Merchant Marine Credential (MMC) endorsed for service in the position for which he or she has been hired. To obtain any Able Seaman *rating* endorsement, use our Able Seaman and Lifeboatman textbooks or **comparable chapters**<sup>(1)</sup> from our Limited Master, Mate and Operator course to prepare for the endorsement. <sup>(1)</sup>*When buying individual chapters, read this paper carefully to avoid buying the same chapter twice*

The Coast Guard often makes changes that affect mariners. They advertise every change as an improvement so that after controlling merchant mariner credentials for almost 70 years you might expect them to have devised a perfect system. Think again!

On April 15, 2009, the old terms *license* and *Merchant Mariner Document* (MMD or *Z-card*)<sup>(1)</sup> were replaced by the new term **Merchant Mariner Credential** (MMC). This credential looks like a passport booklet and contains one or more *endorsements* that detail your personal qualifications and explains your operational limitations.

Over the next five years the old engraved paper licenses and the plastic credit-card size merchant mariner documents (MMD) gave way to the new booklet-style credential.

Endorsements on credentials may sound like double-talk, but every mariner had to adjust to these and other changes as presented in the Coast Guard's rulemaking docket #USCG-2006-24371.

### Obtaining a TWIC Card Comes First

In addition, starting on April 15, 2009, the Coast Guard no longer issued **any** credential unless a mariner applied for and received a Transportation Workers Identity Credential commonly known as a TWIC or a biometric **identity card**. If the Transportation Security Agency (TSA) denied you a TWIC, you could appeal their decision but the Coast Guard would not review the TSA decision or process your application until the TSA was satisfied. **Consequently, every mariner must deal with two separate government agencies within the Department of Homeland Security and not just with the Coast Guard as in the past.**

## SELECT THE "CREDENTIAL" YOU WANT

On the new Merchant Mariner Credential (MMC), a mariner's qualifications are categorized as a *Domestic Endorsement* and/or an *International Endorsement*.

**We added certain symbols to guide you to our textbook chapters** that cover some of the principal endorsements for both *officers* and *ratings*. **We hope this helps you to select the correct exam study material.** Here are the

abbreviations [ ] and symbols **we use in this report**:

- ★ The information in this chapter appears in Master, Mate and Operator and Able Seaman courses.
- [LL] refers to a lower-level (i.e., limited-tonnage) **officer** endorsement. *[Our Limited Master, Mate & Operator course prepares limited tonnage deck officers for various endorsements.]*
- [UL] refers to upper-level officer endorsements. *[Note: Certain chapters may be helpful in preparing for those endorsements.]*
- [AB] refers to the deck **ratings** endorsements covered in our Able Seaman and Lifeboatman textbooks. *[Many Able Seaman chapters also appear in the Limited Master, Mate & Operator textbooks!]*
- [T] refers to Towing. *[Our Towing Vessel Officers' Guide used with chapters from Limited Master, Mate & Operator are directed at towing endorsements.]*
- [QMED] stands for Qualified Member of the Engine Department **ratings**. *[These engineering subjects are covered by one or more of our QMED textbooks.]*
- [WE] stands for Workboat Engineer. *[These textbooks prepare mariners for a number of limited engineer officer endorsements and are useful to all QMED applicants.]*
- [TMAN] stands for Tankerman **ratings**. *[While these endorsements are covered in our Tankerman textbook, tankerman candidates must attend school to obtain their endorsements.]*
- [STCW] indicates that demonstrations of proficiency are required.
- [TOAR] indicates that demonstrations of proficiency by completing a Towing Officer Assessment Record are required.
- [Entry]. An entry-level mariner has very limited basic requirements.]
- [COR] = Certificate of Registry *endorsements*.

### Groups of Deck Officer Endorsements

In Title 46 Part 11 of the Code of Federal Regulations (CFR), the Coast Guard lists 24 different **groups** of **deck endorsements**. This grouping is necessary to understand which topics to study to prepare for your *professional exam*. In this paper, we **limit** our recommendations to the material you will need to study to meet the Coast Guard requirements in the **List of Exam Topics** in 46 CFR Table 11.910-2 as published in the Code of Federal Regulations. The principal *officer* endorsements appear in the 24 numbered columns in this table that appears below.

## TYPES OF OFFICER ENDORSEMENTS

COLUMN NUMBER	TYPE OF OFFICER ENDORSEMENT
1.	Master, oceans/near coastal, any gross tons.
2.	Chief Mate, oceans/near coastal, any gross tons.
3.	Master, oceans/near coastal, 500/1,600 gross tons.
4.	Second Mate, oceans/near coastal, any gross tons.
5.	Third Mate, oceans/near coastal, any gross tons.
6.	Mate, oceans/near coastal, 500/1,600 gross tons.

COLUMN NUMBER	TYPE OF OFFICER ENDORSEMENT
7.	Master, oceans/near coastal AND Mate, near coastal 200 gross tons. (Includes Master, near coastal, 100 gross tons.)
8.	Operator, uninspected passenger vessels, near coastal.
9.	Operator, uninspected passenger vessels, Great Lakes/Inland.
10.	Apprentice mate (steersman), towing vessels, oceans (domestic trade) and near-coastal routes.
11.	Apprentice Mate (steersman), towing vessels, Great Lakes and inland routes.
12.	Steersman, towing vessels, Western Rivers.
13.	Master, Great Lakes/Inland OR Master, inland, any gross tons.
14.	Mate, Great Lakes/Inland, any gross tons.
15.	Master, Great Lakes/Inland, 500/1,600 gross tons.
16.	Mate, Great Lakes/Inland, 500/1,600 gross tons.
17.	Master or Mate, Great Lakes/Inland, 200 GT.
18.	Master, Rivers, any gross tons.
19.	Master, Rivers, 500/1,600 gross tons.
20.	Mate, Rivers, 500/1,600 gross tons.
21.	Master or Mate, Rivers, 200 gross tons. (Includes Master, Rivers, 100 gross tons).
22.	Master, uninspected fishing industry vessels, oceans/ near coastal.
23.	Mate, uninspected fishing industry vessels, oceans/ near coastal.
24.	First Class Pilot.

[Note: For purposes of simplicity this basic document uses the terms "Gross Tons" (GT) and "Gross Register Tons" (GRT) interchangeably.]

Most titles in the list should be easy to recognize. The term "any gross tons" (AGT) refers to an endorsement on a credential that allows you to serve on vessels greater than 1,600 gross register tons. The Coast Guard refers to these as "upper-level" [UL] officer endorsements.

Endorsements that limit your service to vessels of less than 1,600 gross tons are designated as "lower-level" [LL] or "limited-tonnage" officer endorsements. For example, the endorsements listed under columns 7 and 17 encompass most of the Masters and Mates who can serve Coast Guard inspected small passenger vessels up to 200 gross register tons.

Many applicants will choose to add separate "radar observer", "sail," or "assistance towing" endorsements to their credential. Towing vessel officers are **required** to have radar observer endorsements and to keep them current.

The endorsements in columns 8 and 9 are often called "Six-Pack" endorsements and only may be used on uninspected passenger vessels (UPV) carrying six or less passengers for hire.

The endorsements in columns 10, 11, and 12 are the towing endorsements effective May 21, 2006. No licenses using the old terminology "Operator of Uninspected Towing Vessels" were issued after May 21, 2001. It was replaced by the towing endorsements that specify the route where the endorsement is valid – Ocean or Near Coastal (10), Great Lakes and Inland (11) or Western Rivers (12).

### The "Deck Guide" & the "Engine Guide"

The latest editions of the Coast Guard's Guide for Administration of Merchant Marine Deck Examinations, (Deck Guide) and a comparable publication for Engine Department exams are internal Coast Guard documents that give a brief description of the modules in each existing exam listing the module #, number of questions, and passing grades required. The Coast Guard groups the exam topics discussed into groups called "modules" *for their ease and convenience in administering their exam program*. Feel free to ask either the REC or the National Maritime Center for a copy of the page from that publication that describes the exam and lists each "module" in the exam you must take and the number of questions it contains.

### THE DIFFERENCE BETWEEN EXAM "TOPICS" AND "MODULES"

#### The Coast Guard Still Gives Exams

While many Coast Guard Approved Courses provide their own examinations as part of a package that includes formal classroom instruction, Coast Guard Regional Exam Centers still provide and proctor exams prepared by the National Maritime Center. This paper provides additional information about these exams.

**Exam "Subjects."** The "Subjects" (also referred to as "*topics*") that each exam must cover are listed at 46 CFR Table 11.910-2 in the Code of Federal Regulations in Figure 1ö (above). This Table is one of the few things in Coast Guard credentialing that remained relatively unchanged from 1989 to the present. The regulations require testing on each "subject" shown by an "X" in the 24 vertical columns that represent major license groups.

In some cases the "X" is modified by numbers within the columns whose meaning is explained in the *Endnotes* at the end of the table. Consequently, we advise you to prepare for questions dealing with each subject marked either by an "X" or by a number. In many cases, you will be tested by questions drawn from *many* subject areas listed in the left hand column of the table.

**Exam "Modules."** The Coast Guard administers your exam in a number of sections called "modules." Each "module" may contain one or more "subjects" *arranged for the convenience of the Coast Guard in administering the exam*. These "modules" are given generic names like Deck General [G], Navigation Problems [P], Deck and Environmental Safety [S], Rules of the Road [R], and Navigation General [N] – terms that appear deceptively simple. However, **remember that most "modules" contains a collection of different subjects**.

When you prepare for an exam, be sure that you prepare for each "subject" listed in the *Examination Topics* in the appropriately numbered column in Table 11.910-2 (above). **For example**, for a 100-ton near-coastal Master's endorsement, look only at the subjects listed in column 7. Highlight column 7 from the top to the bottom of each page so you do not wander into another column. When an "X" appears in column 7, it means that you must prepare to answer questions or work problems on the "subject" listed on the left-hand side of the page. When a **number** appears in column 7, you must consult the *endnotes* at the end of the table to see if it applies to the endorsement you seek.

## APPLYING FOR A CREDENTIAL OR AN ENDORSEMENT

If you are *upgrading* (i.e., adding endorsements to) your credential from one level to another, be sure to ask the Coast Guard to specify both the "subjects" and the "modules" you must prepare for. This information also is available in the Coast Guard's "Deck Exam Guide" that provides the identification of each module in the exam you will be taking. If you cannot or do not obtain this information and are unable to limit the scope of your study accordingly, prepare to take the full exam to be on the safe side.

**All "subjects" are NOT treated equally on an exam!** Some subjects are covered in much greater depth or detail than others. There are more questions on some subjects than on others within any given test module. Modules change from exam to exam and from time to time since the Coast Guard constantly generates new exams and pulls and refines questions from their data bank at random. In our individual textbook chapters, we intend to treat each topic as comprehensively as possible, although we caution you that all topics are *not* treated equally on your exam.

There are a variety of approaches to prepare for a Coast Guard exam. Most of these approaches can work when presented by qualified schools or knowledgeable and experienced individual instructors. Many have had recent experience with Coast Guard exams and can offer meaningful advice and training. Some schools offer "Coast Guard Approved" courses that grant course-completion certificates the Coast Guard recognizes in lieu of Coast Guard exams. The National Maritime Center (NMC) in Martinsburg, West Virginia, maintains an updated list of Coast Guard-approved courses. You can contact them by phone at (304) 433-3400 or by FAX at (304) 433-3413 or by e-mail at [iasknmc@uscg.mil](mailto:iasknmc@uscg.mil).

We believe that if you learn as much as you can through home study before you go to school and/or before you sit for a Coast Guard exam, you will find that you took positive steps in the right direction. However, only you can decide how many steps to take and how hard to study. Prepare as much as you can to assure your best progress in school, on the exam, and on the job.

Although MET does not operate a "school," we believe that exam preparation is an essential part of today's credentialing picture. We work hard to prepare our study materials to reflect the latest information to guide both students and their instructors.

Do not expect much in the way of "guidance" from your local REC on which school they "recommend" or even which books (other than government publications) to consult. In fact, we found many of their recommendations regarding study materials are outdated and misleading. In fact, the only Coast Guard subject matter specialists in the system reside at the National Maritime Center in Martinsburg, West Virginia. This is why very few examiners at the Regional Exam Centers would be able to answer specific exam questions even if they were allowed to do so. The RECs were "dumbed down" over 30 years ago when multiple choice questions replaced essay type questions that had to be graded by knowledgeable Coast Guard personnel.

To apply for ANY Coast Guard credential, you should **FIRST** contact the nearest Regional Exam Center (REC).

While the Coast Guard has many offices throughout the country, RECs are the *only* Coast Guard offices that handle merchant mariner credentials, endorsements, and renewals. This is a very specialized area within the Coast Guard. Under considerable pressure from the public, RECs now offer a better quality of information to the public in the form of written instructions than in the past. However, many RECs are still very hard to reach by phone. However, you can always call the "helpdesk" at the National Maritime Center in Martinsburg, WV.

ASK the Coast Guard to send you all the instructions and information they have on the credential and/or endorsements you seek. The information is also available on the Internet. It is *free*, and it is important because it describes the exact procedures you must follow. Use only the most recent information and application forms. Last year's information passed on from a friend may no longer be correct and may mislead you. This information should include:

- An application blank on a Coast Guard-furnished form.
- The physical standards you must meet and the appropriate physical exam blank form for your doctor to complete. These standards change from time to time. For example, in 2008, the Coast Guard issued Navigation and Vessel Inspection Circular (NVIC) #04-08 that details 202 potentially disqualifying medical conditions. If you plan a career in the merchant marine, it is important that you know that some medical conditions can limit or shorten that career or preclude it entirely while other conditions can be waived provided that you follow the instructions from the review panel at the National Maritime Center.
- **Physical exam.** The Coast Guard may reject your physical exam results if the doctor does not fill out the form correctly. Be certain the doctor (or his nurse or receptionist) fills out the form completely and carefully. It is in your best interest to check the completed form carefully before you leave the doctor's office. A simple screw-up can lead to weeks of bureaucratic frustration and delay.
- **Drug Testing.** Information about Coast Guard drug testing requirements. If you have questions about drug testing that are not answered in the Coast Guard hand-outs, we **recommend** NMA Report #R-315 (series). Reports in this series cover the subject of drug testing and present drug testing regulations rarely provided to mariners. These reports are available on line and free of charge at [www.nationalmariners.us](http://www.nationalmariners.us) under "Research Reports."
- **Sea Service.** The qualifying "sea service" experience must meet requirements for the endorsement you seek. You must "document" these requirements with a letter from your employer(s) or with Coast Guard "discharge" forms.
- **Schedule your exam.** Information about taking your "professional exam" such as whether "walk-in" exams or exams by appointment only are given at the REC.

- **User Fees.** Information about user fees you must pay to obtain a credential or its endorsements.

Unfortunately, we found that information and guidance given by phone from the RECs was often hard to get or incomplete although the Coast Guard devoted greater effort into simplifying and clarifying their handouts and their internet presentations. Read and study their material because it is the most up-to-date material available. Be sure to resolve any conflicts to your satisfaction before making an appointment to take your exam.

Always keep in mind that the exam is only part of the credentialing process although it is the final part! The subjects we describe (below) are the same as those on the list of exam topics (above). Our **recommendations** are limited, for the most part, to where to find the study material necessary to prepare for your exam.

**Price.** If you order study materials from us, we will give you a firm "price quotation" when you place your order. Please note that prices often fluctuate. This is why we do not show any prices here. Shipping charges also apply and are quoted separately.

**Availability.** Unfortunately, some books by other publishers that we recommend may be "out of print" or "out of stock" and unavailable when you need them. It is also true of books the Coast Guard recommends or uses as source material on certain exam questions. However, we can provide you with the latest information on price, availability, and substitutes. If we do not have an item in stock, we have connections with independent vendors we can call upon to help you.

### IS THIS YOUR FIRST COAST GUARD CREDENTIAL?

The formal application process allows the Coast Guard to weigh your past experience and evaluate the skills you master to determine if they provide "...satisfactory evidence to the undersigned that (you) can safely be entrusted with the duties and responsibilities of..." the endorsement you are applying for.

Preparing for a Coast Guard credential and endorsement is a unique experience. The Coast Guard **evaluates** all of your past "sea service," that you have sworn to on your application that must be listed accurately and correctly. They determine whether that sea service applies toward the credential you seek and is credible. It is then filed away when your application is finally "approved." That is probably the last time you will see it unless you have a major accident or some other unique experience that warrants future scrutiny.

When the Coast Guard "evaluates" your application and approves you to sit for a "professional exam," you are half-way through the process. You have proven your "experience" and "fitness" to the Coast Guard's satisfaction and your "identity" to the Transportation Security Administration. Now you will be examined on your nautical **book knowledge** and how well you know "the rules" and, for some endorsements, on a further assessment of how well you can apply certain skills and factual knowledge (i.e., a practical demonstration before an "Assessor" or a "Designated Examiner.")

The written portion of the exam represents the **minimum**

**knowledge** the Coast Guard expects of any person who holds the endorsement you applied for. Depending on the endorsement you seek, you **may** also have to demonstrate that you can perform a number of tasks to the satisfaction of an "Assessor" or "Designated Examiner" accepted by the Coast Guard. Any such "**demonstrations of proficiency**" are in addition to the "book knowledge" covered in the topics in Table 11.91062.

As you glance through the list of exam subjects in Table 11.910-2 (above), you will see that your past "sea service," however rigorous, probably did not teach you all the "book knowledge" you need to know to pass the exam. In all probability, you will have to:

Learn something new. Coast Guard rules and regulations in the Code of Federal Regulations are the rules that both you and the Coast Guard must abide by. There is no way around it or you will have to learn them!

Learn something you will "never use." You may never need some of the information you are preparing to test on, but the endorsement you seek requires it.

Learn something accurately and in great detail. One example for every deck officer is the Navigation Rules.

Learn or re-learn correct study habits...as your school experiences should have taught you. Preparing for an endorsement may involve more reading than you are accustomed to...either from books or from hours spent in front of a computer screen studying questions and answers.<sup>(1)</sup> *[<sup>(1)</sup>Comment: Most computer programs contain the same multiple choice questions found in our books –without the explanation, comment, or organization that we added in our chapters.]*

Replace incorrect information you learned in the past with correct information. Some information learned by "word of mouth" from other mariners is notoriously inaccurate. Much information learned "years ago" has not improved with age and may be out of date!

*[Note: Any new "Endorsement(s)" added to an existing credential will be in the form of a label that you must paste in your new credential booklet with instructions furnished by the National Maritime Center.]*

### COAST GUARD CREDENTIALING REGULATIONS

Coast Guard credentialing regulations appear in Title 46, Code of Federal Regulations (CFR) in Parts 10 through 15. Many changes are fairly recent and swept away many previous regulations. Among other things, these regulations describe in detail the different requirements for each of the endorsements listed in Table 11.910-2 (above). Chances are good that the information the Coast Guard provides you free of charge contains the information you need. However, if it does not or if you need it for reference, this information is contained in on the internet at: <http://www.ecfr.gov>.

Understand that the printed version of the CFR lags behind the electronic version of the regulations.

This is the e-mail address for the electronic version of Title 46, Code of Federal Regulations, Parts 10-15 from the Government Printing Office(GPO) access page to the entire Code of Federal Regulations.

Information on ***how to use the CFR and the Federal Register*** is available free on line from the National Mariners

Association.<sup>(1)</sup> [<sup>(1)</sup> Refer to NMA Report #R-223, Rev.5, titled How Merchant Mariners Can Access Federal Regulations in the Federal Register/CFR System. 10p.]

**HOW DO I FIND THE STUDY MATERIAL I NEED?**

Here is where MET can help!

MET publishes a five volume set of books titled Limited Master, Mate and Operator that contains most of the study material required for most limited-tonnage endorsements from Operator of Uninspected Passenger Vessels through Master and Mate 500/1,600 tons, Near Coastal. Generally, we listed the titles of the individual chapters in these seven numbered books plus several additional books listed below.

While we prefer to sell entire books, *we do sell*

*individual chapters to meet individual needs.* The stock number for Book 1 is BK-001; for Chapter 1 in Book 1 is BK-001C01 (i.e., volume # followed by chapter #) throughout all seven books. In addition, Rules of the Road (i.e., "Navigation Rules") is tested on every deck exam and with every raise in grade if you have not been tested on that subject within the past 12 months.

We also sell the Towing Vessel Officer's Guide, MET Stock #BK-007 for the new towing vessel Apprentice Mate/Steersman endorsements. Individual chapters from that book are available on the same basis.

If and when certain topics are not included in a MET textbook, or if you seek an alternate source, we will suggest other textbooks or sources of information by other publishers that we distribute so you can obtain complete coverage with the study material you order.

**Figure 1  
LIST OF EXAM TOPICS**

Examination topics	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Navigation and position determination:																								
Ocean Track Plotting:																								
Middle Latitude Sailing	1	1	1																1	1		1	1	1
Mercator Sailing	X	X	X	7															X	X		X	X	X
Great Circle Sailing	1	1	1	7															1	1		1	1	1
Parallel Sailing	1	1	1																1	1		1	1	1
Estimated Time of Arrival	X	X	X				1												X	1	1	X	X	1
Piloting:																								
Distance Off	X	X	X	X	X	X	X	X		X	X	X	X	X					X	X	X	X	X	X
Bearing Problems	X	X	X	X	X	X	X	X		X	X	X	X	X					X	X	X	X	X	X
Fix or Running Fix	X	X	X	X	X	X	X	X		X	X	X	X	X					X	X	X	X	X	X
Chart Navigation	X	X	X	X	X	X	X	X	2	X	X	X	X	X	2	2	2	2	X	X	X	X	X	X
Dead Reckoning	X	X	X	X	X	X	X	X		X	X	X	X	X					X	X	X	X	X	X
Celestial Observations:																								
Latitude by Polaris	1	1	1	1															1	1		1	1	1
Latitude by Meridian Transit (Any Body)	1	1																	1			1	1	
Latitude by Meridian Transit (Sun Only)			1	1			1													1				1
Fix or Running Fix (Any Body)	1	1	1																1			1	1	1
Fix or Running Fix (Sun Only)				1			1													1				
Star Identification	1	1	1				1												1			1	1	1
Star Selection	1	1	1				1												1			1	1	1
Times of Celestial Phenomena:																								
Time of Meridian Transit (Any Body)	1	1																	1			1	1	
Time of Meridian Transit (Sun Only)			1	1			1													1				1
Zone Time of Sun Rise/Set/Twilight	1	1	1	1			1												1	1		1	1	1
Speed by RPM	X	X	X							3									X	X		X	X	X
Fuel Conservation	X	X		1			1			3									X			X	X	

Examination topics	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Electronic Navigation	X	X	X	X	X	X	X	X		X	X	X	X	X					X	X	X	X	X	X	
Instruments & Accessories	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Aids to Navigation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Charts, Navigation Publication, & Notices to Mariners	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Nautical Astronomy & Navigation Definitions	1	1	1	1			1												1	1		1	1	1	
Chart Sketch																					4				
Seamanship:																									
Marlinspike Seamanship			X	X	X	X	X	X	X		X		X	X	X	X	X	X	X	X	X			X	
Purchases, Blocks, & Tackle			X	X			X	X	X		X		X	X	X	X	X	X	X	X	X			X	
Watchkeeping:																									
COLREGS	X	X	X	X	X	5	X	5		5	5	5	5	5					X	X	5	X	X	X	
Inland Navigational Rules	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Basic Principles, Watchkeeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Navigation Safety Regulations (33 CFR 164)	X		X				X	X	X	X	X				X				6	6	6	6	6	6	
Compass - Magnetic & Gyro: Principles, Operation, and Maintenance of Gyro Compass	X	X	X	7			1			X	X	X	X	7	X				X	X		X	X	X	
Principles of Magnetic Compass	X	X	X	X	X	3	X	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Gyro Compass Error/Correction	X	X	X	7			1	X		X	X	X	X	7	X				X	X	X	X	X	X	
Magnetic Compass Error/Correction	X	X	X	X	X	3	X	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Determination of Compass Error:																									
Azimuth (Any Body)	X	X	X	7			X																X	X	X
Azimuth (Sun Only)										3									1	1					
Amplitude (Any Body)	X	X	X	7			X																X	X	X
Amplitude (Sun Only)										3									1	1					
Terrestrial Observation	X	X	X	X	X	X	X	X		X	X	X	X	X					X	X	X	X	X	X	

Examination topics	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Meteorology and Oceanography:																								
Characteristics of Weather Systems	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Ocean Current Systems	X	X	X	X			X												X	X		X	X	
Weather Charts and Reports	X	X	X	X	X	X	X	X		X	X	X	X	X					X	X		X	X	X
Tides and Tidal Currents:																								
Terms and Definitions	X	X	X	X	X	X	X	X		X	X	X	X	X					X	X	X	X	X	X
Publications	X	X	X	X	X	X	X	X		X	X	X	X	X					X	X	X	X	X	X
Calculations	X	X	X	X	X	X	X	X		X	X	X	X	X					X	X	X	X	X	X
Vessel Maneuvering and Handling:																								
Approaching Pilot Vessel or Station	X	X																				X		
Vessel Handling in Rivers & Estuaries	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Maneuvering in Shallow Water	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Interaction with Bank/Passing Ship	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Berthing and Unberthing	X	X		X	X	X	X			X	X	X		X	X	X		X	X		X	X	X	
Anchoring and Mooring	X	X	X	X	X	X	X			X	X	X	X	X					X	X	X	X	X	X
Dragging of, Clearing Fouled Anchors	X	X	X	X						X	X	X	X	X					X	X		X	X	X
Heavy Weather Operations	X	X	X	X	X	X	X	X		3	3	3	3	3					X	X		X	X	X
Maneuvering for Launching of Lifeboats and Liferrafts in Heavy Weather	X	X		X			X	X		3		3		3					X			X	X	
Receiving Survivors From Lifeboats/Liferrafts	X	X		X			X	X														X	X	
General: Turn Circle, Pivot Point, Advance and Transfer			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X

Examination topics	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Determine Maneuvering Characteristics of Major Vessel Types	X	X								3												X	X		
Wake Reduction	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ice Operations/Ice Navigation	X	X	X				X	X	X	X	3	X	3						X	X		X	X	X	
Towing Vessel Operations							X	X	X																
Stability, Construction, and Damage Control:																									
Principles of Vessel Construction	X	X	X	X			X	3	X	X	3	X	3	X	X	X						X	X	X	
Trim and Stability	X	X	X	X			X	X	X	X	3	X	3	X	X	X		X	X	X		X	X	X	
Damage Trim and Stability	X	X																				X	X		
Stability, Trim, and Stress Calculation	X	X	X																			X	X		
Vessel Structural Members	X	X	X	7							X	X	3	7								X	X	X	
IMO Ship Stability Recommendations	X	X																				X	X		
Damage Control	X	X	X	7			X	X		X	X	X	X	7	X	X	X	7	X	X		X	X	X	
Change in Draft Due to Density	X																								
Vessel Power Plants:																									
Marine Power Plant Operating Principles	X	X		7			X	X	X	X		X		7	X	X			X			X	X		
Vessel's Auxiliary Machinery	X	X								X		X			X	X						X	X		
Marine Engineering Terms	X	X	X	7			X	X	X	X	X	X	X	7	X	X	X	7	X	X		X	X	X	
Small Engine Operations and Maintenance				X	X	X								X				X							
Cargo Handling and Stowage:																									
Cargo Stowage and Security, including Cargo Gear	X	X	X	7						X	X	X	X	7	X	X	X	7	X	X		X	X	X	
Loading and Discharging Operations	X	X	X							X	X	X	X		X	X	X		X	X		X	X	X	
International Regulations for Cargoes, especially	X	X																				X	X		

Examination topics	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
International Maritime Dangerous Goods Code																									
Dangerous/Hazardous Cargo Regulations	X	X	X				X	X	X	X	X	X	X		X	X	X					X	X	X	
Tank Vessel and Fuel Oil Operations	X	X	X	7						X	X	X	X	7	X	X	X	7	X	X		X	X	X	
Cargo Piping and Pumping Systems																						X	X	X	
Cargo Oil Terms and Definitions																						X	X	X	
Barge Regulations (Operations)							X	X	X																
Fire Prevention and Firefighting Appliances:																									
Organization of Fire Drills	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Classes and Chemistry of Fire	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Firefighting Systems	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Firefighting Equipment & Regulations	X	X	X	7			X	X	X	X	X	X	X	7	X	X	X	7	X	X	X	X	X	X	
Firefighting Equipment & Regulations for T-Boats				9										9				9							
Basic Firefighting and Prevention	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Emergency Procedures:																									
Ship Beaching Precautions	X	X								X		X							X			X	X		
Actions Prior to/after Grounding, Including Refloating	X	X								X		X			X	X			X			X	X		
Collision	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X			X	X		
Temporary Repairs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Passenger/Crew Safety in Emergencies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Fire or Explosion	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Abandon Ship Procedures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Emergency Steering	X	X	X	7			X	X	X	X	X	X	X	7	X	X	X	7	X	X		X	X	X	

Examination topics	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Rescuing Survivors from Ship/Aircraft in Distress	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Man Overboard Procedures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Emergency Towing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Medical Care:																								
Knowledge and use of:																								
International Medical Guide for Ships	X	X																				X	X	
Ship's Medical Chest & Medical Aid at Sea	X	X																				X	X	
Medical Section, International Code of Signals	X	X	X																			X	X	X
Maritime Law:																								
International Maritime Law:																								
International Convention on Load Lines	X	X																				X	X	
SOLAS	X	X																				X	X	
MARPOL 73/78	X	X	X	X															X	X		X	X	X
International Health Regulations	X	X																				X	X	
Other International Instruments for Ship/Passenger/Crew/ Cargo Safety	X	X		X																		X	X	
National Maritime Law:																								
Load Lines	X	X	X	X			X	X		3	3	3	3	X								X	X	X
Certification & Documentation of Vessels	X	X		X	X	X	X	X	X	X		X	X	X	X	X		X	X			X	X	
Rules & Regulations for Inspected Vessels	X	X	X	7						X	X	X	X	7	X	X	X	7				X	X	X
Rules & Regulations for Inspected T-Boats				9										9				9						

Examination topics	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Vessels																								
Rules & Regulations for Inspected Vessels	X	X	X	7						X	X	X	X	7	X	X	X	7				X	X	X
Rules & Regulations for Inspected T-Boats				9										9				9						
Rules and Regulations for Uninspected Vessels					X	X	X	X	X										X	X				
Pollution Prevention Regulations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Pilotage	X	X					X	X	X													X	X	X
Credentialing of Seamen	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Shipment and Discharge, Manning	X	X		X			X			X		X			X	X						X	X	
Title 46, U.S. Code	X	X								X		X			X	X						X	X	
Captain of the Port Regulations, Vessel Traffic Service Procedures for the Route Desired																					X			
Shipboard Management and Training:																								
Personnel Management	X	X								X		X			X	X			X			X	X	
Shipboard Organization	X	X								X		X			X	X			X			X	X	
Required Crew Training	X	X								X		X			X	X			X			X	X	
Ship Sanitation	X	X		X	X	X	X	X	X	X		X		X	X	X		X	X			X	X	
Vessel Alteration/Repair Hot Work	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Safety	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Ship's Business:																								
Charters	X	X					X	X	X	X		X			X	X						X	X	
Liens and Salvage	X	X					X	X	X	X		X			X	X						X	X	
Insurance	X	X					X	X	X	X		X			X	X						X	X	
Entry and Clearance	X	X					X	X	X	X		X			X	X						X	X	
ISM and Safety Management Systems	X	X	X				X	X	X													X	X	X
Certificates and	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X

Examination topics	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Signals: Storm/Wreck/Distress/ Special	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
International Code of Signals	X	X	X																			X	X	X
IMO Standard Maritime Communication Phrases	X	X	X																			X	X	X
Lifesaving:																								
Survival at Sea	X	X	X	X	X		X												X	X		X	X	X
Lifesaving Appliance Regulations	X	X	X	7						X	X	X	X	7	X	X	X	7				X	X	X
Lifesaving Appliance Regulations for T-Boats				9										9				9						
Lifesaving Appliance Operation	X	X	X	7	X	X	X	X	X	X	X	X	X	7	X	X	X	7	X	X		X	X	X
Lifesaving Appliance Operations for T-Boats				9										9				9						
Search and Rescue:																								
Search and Rescue Procedures	X	X	X							X		X							X			X	X	X
Automated Mutual- Assistance Vessel Rescue System and International Aeronautical and Maritime Search And Rescue Manual	X	X	X																			X	X	X
Sail/Auxiliary Sail Vessels Addendum (8)	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X						

1. For ocean routes only.
  2. River chart navigation only.
  3. Only on Great Lakes specific modules taken for Great Lakes and Inland routes.
  4. Including recommended courses, distances, prominent aids to navigation, depths of water in channels and over hazardous shoals, and other important features of the route such as character of the bottom. The Coast Guard may accept chart sketching of only a portion or portions of the route for long extended routes.
  5. COLREGS required if endorsement is not limited to non-COLREGS waters.
  6. For officer endorsements of 1,600 GRT or more.
  7. Only for officer endorsements of 100 GRT or more.
  8. Sail vessel safety precautions, rules of the road, operations, heavy weather procedures, navigation, maneuvering, sailing terminology, heavy weather sail/auxiliary sail endorsements to master, mate or operator for uninspected passenger vessels are also tested in subjects contained in this addendum.
  9. For officers of less than 100 GRT.
- [USCG-2004-17914, 78 FR 77909, Dec. 24, 2013, as amended by USCG-2014-0688, 79 FR 58277, Sept. 29, 2014]

Table 11.910-2 — License Codes

**“SPECIAL ORDER” OF INDIVIDUAL DECK CHAPTERS**

**General Statement:**

- Most of our publications were prepared for Limited Tonnage mariners although some are useful for all levels.
- We do **not** publish chapters on Celestial Navigation topics. We recommend attending a Coast Guard-approved Celestial course to fulfill any requirements.
- Because of the large number of individual endorsements now available, **individual chapters** from all our textbooks are available to fill your requirements for information. The chapter titles roughly correspond to the List of Exam Topics in Figure 10 above. If this connection is unclear, please ask us to explain.
- We will spiral bind all special order material.
- Every original exam for a Coast Guard deck endorsement and many upgrade exams call for a knowledge of the Navigation Rules (NR).
- Towing vessel officer endorsement candidates begin with the Navigation Rules. Then move to chapters in the Towing Vessel Officer’s Guide. Then move on to those additional exam subjects marked [T] in the Master, Mate and Operator books.
- Towing endorsements limited to the Western Rivers do **not** study subjects marked [T] listed in MM&O Book 3 (above).
- Pages are numbered within each chapter using these chapter prefix letters shown in parentheses in the right hand column. Note that some chapters appear in more than one MET publication. Do not duplicate purchases!

### Explanation of Symbols

- Ä = Additional publications, training charts or plotting tools are recommended to complete this subject.
- ★ = This chapter in the Able Seaman books is *the same* as the chapter in the Master, Mate and Operator books.
- [T] = Towing. This subject is tested on towing vessel officer exams.
- [R] = This subject is tested by itself in the Navigation Rules (i.e., Rules of the Road) exam module (Passing Grade 90%).
- [D] = This subject is tested as part of a "Deck General" exam module.
- [S] = This subject is tested as part of a "Deck Safety" exam module.
- [N] = This subject is tested as part of a "Navigation General" exam module.
- [P] = This subject is tested as part of a "Navigation Problems" exam module.
- [AB] = Study each chapter marked [AB] for an Able Seaman endorsement,

### NAVIGATION RULES

RB6169: Navigation Rules for International and Inland Waters [T] [R] [AB] .....(NR)

### TABLE OF CONTENTS LIMITED MASTER, MATE, AND OPERATOR And Associated USCG Endorsement Study Courses (Revised Edition "K")

**General Statement:** Every original exam for a U.S. Coast Guard endorsement including Apprentice Mate/Steersman and Able Seaman calls for knowledge of the Navigation Rules. *In addition to* the Navigation Rules, Books 1, 2, 3, 4 & 5 will prepare you for Master, Mate, and Operator endorsements to 100 gross register tons (GRT). You will need to study subjects in Books 6 & 7 for larger tonnage endorsements up to 1,600 GRT (3,000 tons ITC). Towing vessel officer endorsement candidates need to begin their studies with the Navigation Rules and then move to the Towing Vessel Officer's Guide and then on to additional exam subjects marked [T]. However, candidates for towing endorsements limited to the Western Rivers need not study chapters 15, 17, 27, 28 and above. Individual chapters listed below can be purchased separately upon request.

#### NAVIGATION RULES (FOR ALL STUDENTS)

**BK-234** " Navigation Rules for International and Inland Waters including the Great Lakes and Western Rivers (NR)

#### LIMITED MASTER, MATE, AND OPERATOR – BOOK 1 (400 Pages)

Feedback .....	
Summary of Changes.....	
Foreword.....	i
Chapter 1 " Coast Guard Credentialing Information [T] (24 pages) .....	CRED-1
Chapter 2 " Drug and Alcohol Testing [T] (22pages) .....	DAT-1
Chapter 3 " Manning [T] (30 pages) .....	MAN-1
Chapter 4 " First Aid and Medical Care [T] [S] [AB] (40 pages) .....	FA-1
Chapter 5 " Pollution Control [T] [S] [AB] (142 pages) .....	PC-1
Chapter 6 " Nautical Terms and Ship Construction [T] (36 pages).....	TERM-1
Chapter 7 " Practical Stability [T] [S] (96 pages) .....	STAB-1

#### LIMITED MASTER, MATE, AND OPERATOR – BOOK 2 (366 Pages)

Chapter 8 " Marlinspike Seamanship, Purchases, and Safe Practices [T] [D] [AB](68 pages).....	SEA-1
Chapter 9 " Anchoring, Mooring, and Line Handling [T] [D] [AB] (46 pages) .....	A&M-1
Chapter 10 " Maneuvering and Handling [T] [D] [AB] (58 pages).....	M&H-1
Chapter 11 " Sail and Auxiliary Sail Addendum [S] (16 pages) .....	SAIL-1
Chapter 12 " Basic Principles of Watchkeeping [T] [D] [AB] (26 pages).....	WAT-1
Chapter 13 " Radiotelephone Communications [T] [S] (62 pages).....	C-1
Chapter 14 " Emergency Procedures [T] [D] [S] [AB] (52 pages).....	EMER-1
Chapter 15 " Survival at Sea [T] [S] [AB] (30 pages).....	SAS-1

#### LIMITED MASTER, MATE, AND OPERATOR – BOOK 3 (352 Pages)

Chapter 16 " Rules and Regulations for Uninspected Vessels [T] [S] (40 pages).....	RRC-1
Chapter 17 " Rules and Regulations for Small Passenger Vessels [S](130 pages).....	RRT-1
Chapter 18 " Lifesaving Appliances for Small Passenger Vessels (44 pages) .....	LST-1
Chapter 19 " Fires, Firefighting and Fire Prevention [T] [S] [AB] (116 pages).....	FF-1
Chapter 20 " Ship Power Plants [S](14 pages).....	ENG-1

#### LIMITED MASTER, MATE, AND OPERATOR – BOOK 4 (332 Pages)

Chapter 21 " Weather Systems and Forecasting [T] [N] (80 pages) .....	W-1
Chapter 22 " Reference Publications [T] [N] (40 pages).....	PUB-1

Chapter 23 ó Aids to Navigation [T] [N] [AB] (68 pages) .....	A/N-1
Chapter 24 ó Electronic Navigation [T] [N] (44 pages).....	ENAV-1
Chapter 25 ó Radar Observer Certificate [T] (2 pages) .....	RO-1
Chapter 26 ó Chart Navigation [T] [N] (54 pages).....	CNAV-1
Chapter 27 ó Principles of Magnetic and Gyrocompasses [T] [N] [P] (36 pages) .....	COMP-1

**LIMITED MASTER, MATE, AND OPERATOR – BOOK 5 (296 Pages)**

Chapter 28 ó Basic Piloting [T] [P] (150 pages) .....	P-1
Chapter 29 ó Chart Plotting [T] (42 pages) .....	PLOT-1
Chapter 30 ó Tide and Tidal Current Publications [T] [N] (36 pages) .....	TCP-1
Chapter 31 ó Tide and Tidal Current Calculations [T] [N] [P] (28 pages) .....	TCC-1
Chapter 32 ó Local Knowledge [T] (8 pages).....	OCMI-1
Chapter 33 ó Compass Correction at Sea [N] [P] (24 pages).....	CCS-1

**LIMITED MASTER, MATE, AND OPERATOR – BOOK 6 (328 Pages)**

Chapter 34 ó Ship's Business [T] [D] (92 pages).....	SB-1
Chapter 35 ó Ship Sanitation [T] [S] (18 pages) .....	SS-1
Chapter 36 ó Temporary Repairs [T] [D] (26 pages).....	TR-1
Chapter 37 ó Operational and Safety Information [T] [D] [S] (122 pages) .....	OSI-1
Chapter 38 ó Tank Safety [T] [S] (30 pages) .....	TS-1
Chapter 39 ó Ice Operations and Ice Navigation [T] [D] (32 pages).....	ICE-1

**LIMITED MASTER, MATE, AND OPERATOR – BOOK 7 (310 Pages)**

Chapter 40 ó Rules and Regulations for Offshore Supply Vessels [S] (60 pages) .....	OSV-1
Chapter 41 ó Cargo Handling and Stowage [D] (84 pages) .....	CHS-1
Chapter 42 ó National Maritime Law (18 pages) .....	LAW-1
Chapter 43 ó International Maritime Organization [S] (24 pages) .....	IMO-1
Chapter 44 ó Signaling [S] (32 pages).....	SIG-1
Chapter 45 ó Ocean Current Systems [N] (10 pages).....	OCS-1
Chapter 46 ó Search and Rescue Procedures (2 pages).....	SAR-1
Chapter 47 ó Automated Mutual Assistance Vessel Rescue System [S] (28 pages).....	AMVER-1
Chapter 48 ó Navigation Safety Regulations [T] (20 pages).....	NSR-1
Chapter 49 ó Fuel Conservation [P] (16 pages) .....	FC-1
Chapter 50 ó Speed by RPM [P] (8 pages) .....	RPM-1

**Additional study material you may need to purchase**

**BK-678** Merchant Marine Deck Examination Illustration Book

**TOWING VESSELS OFFICER GUIDE**

**BK-007** ó Towing Vessels Officer's Guide (356 pages) [T] (TVOG)

**ABLE SEAMAN & LIFEBOATMAN**

**BK-105-01 & BK-105-02** – Chapters marked [AB] (above) are part of the Able Seaman & Lifeboatman Course]

**LIFEBOATMAN**

**BK-105-1** ó Lifeboatman [S] [AB] [WE] (188 pages) LB

**Symbols:**

Types of Multiple Choice Deck Exam Questions

- [D] = óDeck Generalö Questions
- [S] = óSafety and Pollutionö Questions
- [N] = óNavigation Generalö Questions
- [P] = óPlotting Problemsö & other Math Problems.
- [NR] = óNavigation Rulesö Questions

**Other Symbols:**

- [AB] = Part of an Able Seaman & Lifeboatman Course
- [T] = Part of a Towing officer Course
- [WE] = Part of a Workboat Engineer Course

## ABLE SEAMAN AND LIFEBOATMAN – BOOK 1 – Revised Edition "J"

- For *All* Able Seaman ratings: Use *all* the chapters marked [AB] above in the Master, Mate and Operator books and add the following two chapters ó Chapter 1 and Chapter 7.

Foreword.....	
Chapter 1 Introduction to Able Seaman and Lifeboatman Certification [AB] (46 pages).....	(AB-1)
Chapter 7 Advanced Seamanship [AB] (33 pages).....	(AS)

### LIFEBOATMAN (REVISED EDITION "E")

- Lifeboatman is both a òdeckö and an òengineö rating. Although the Coast Guard requires attendance at formal training classes, the chapters in this book will help prepare you for these classes and/or may be used as a textbook for this class.

Foreword.....	
Chapter 1 Lifeboatman [AB] [WE] (188 pages).....	(LB)
Chapter 2 Survival at Sea [T] [S] [AB] (29 pages).....	(SAS)
Chapter 3 Lifeboatman Addendum [AB] [WE] (2 pages).....	(LBA)
Chapter 4 Requirements for Shipboard Training Materials (14 pages).....	(TM)

### TOWING VESSEL OFFICERS GUIDE

- The Chapters marked [T] in this book will assist you in preparing for the Apprentice Mate/Steersman exam. However, you will also be tested on *all other chapters that are marked [T]* listed in the Master, Mate and Operator books (above). The Apprentice Mate/Steersman exam is the only towing knowledge-based exam and must be taken before any formal pilothouse training is accepted.

Foreword.....	
How to Prepare for the Coast Guard Apprentice Mate/Steersman Exam.....	
Chapter 1 ó Towing Credentials and Endorsements [T] (15 pages).....	(TC&E)*
Chapter 2 ó Manning of Towing Vessels [T] [D] (37 pages).....	(MTV)
Chapter 3 ó Rules and Regulations for Uninspected Towing Vessels [T] [S] (57 pages).....	(UTV)
Chapter 3A ó The Road to Towing Vessel Inspection(32 pages).....	(TVI)
Chapter 4 ó Assistance Towing [T] (3 pages).....	(AT)
Chapter 5 ó Towing Operations [T] [D] (74 pages).....	(TOPS)
Chapter 6 ó Western Rivers Navigation Problems [T] [N] [P] (51 pages).....	(WRN)†
Chapter 7 ó Towing Officer Assessment Record [T] (45 pages).....	(TOAR)
Chapter 8 ó Pilotage [T] (14 pages).....	(PIL)

### SPECIAL ORDER OF INDIVIDUAL ENGINE CHAPTERS

- This series of books is designed to prepare candidates for all òlower levelö engineer exams. Individual chapters are available. Multiple choice questions in these chapters are based on the Coast Guard's engineering data base and *not* the deck database..

### WORKBOAT ENGINEER – Revised Edition “D” – BOOK 1

Foreword.....	
Chapter 1 Workboat Engineer Training, Licensing, and Manning (27 pages).....	(WE)
Chapter 2 Useful Information for Licensed and Unlicensed Workboat Engineers (35 pages).....	(U)
Chapter 3 Basic Principles of Watchkeeping (26 pages).....	(WAT)
Chapter 4 Care and Use of Common Hand Tools (59 pages).....	(HT)
Chapter 5 Fundamentals of Diesel Engines (90 pages).....	(DE)
Chapter 6 Diesel Engines: Questions and Answers (110 pages).....	(DEQ)
Chapter 7 Auxiliary Machinery (84 pages).....	(AUX)

### WORKBOAT ENGINEER – BOOK 2

Chapter 8 Refrigeration and Air Conditioning (31 pages).....	(REF)
Chapter 9 Electricity ( 55 pages).....	(E)
Chapter 10 Electrical Questions and Answers (144 pages).....	(EQ)
Chapter 11 Pollution Control for Engineers [T] [S] [AB] (121 pages).....	(PCE)
Chapter 12 Rules and Regulations for Offshore Supply Vessels [S] (67 pages).....	(OSV)
Chapter 13 Operational and Safety Information for Engineers (123 pages).....	(OSIE)
Chapter 14 Tank Safety [T] [S] (31 pages).....	(TSE)

**WORKBOAT ENGINEER– BOOK 3**

Chapter 15 Fires, Firefighting, and Fire Prevention for Engineers [T] [S] [AB] (79 pages)..... (FFE)  
 Chapter 16 Practical Stability ( 53 pages) ..... (STABE)  
 Chapter 17 Temporary Repairs [T] [D] (26 pages)..... (TRE)  
 Chapter 18 First Aid [T] [S] [AB] ( 28 pages) ..... (FAE)  
 Chapter 19 Lifeboatman [T] [AB] [S] (152 pages)..... (LBE)  
 Chapter 20 Survival at Sea[T] [S] [AB] (29 pages)..... (SAS)  
 Chapter 21 Emergency Procedures (52 pages)..... (EMER)

**SPECIAL ORDER OF OTHER CHAPTERS**

**TANKERMAN (Revised Edition "G")**

• Tankerman is neither a deck nor an engine rating. The Coast Guard requires your attendance at formal training classes. This book will help prepare you for these classes and may serve as your textbook. It contains text material *without USCG multiple choice questions and answers.*

Foreword .....  
 Chapter 1. The Tankerman in Transition (18 pages).....(TMAN)  
 Chapter 2. Operational and Safety Information (94 pages) .....(OSI)  
 Chapter 3. Tank Safety (23 pages)..... (TST)  
 Chapter 4. Fires, Firefighting & Fire Prevention (45 pages) ..... (FFT)  
 Chapter 5. Bulk Shipment of Chemicals by Water (64 pages) .....(BSC)  
 Chapter 6. Liquefied Gases (21 pages) .....(LG)  
 Chapter 7. Pollution Control[T] [S] [AB] (104 pages) .....(PCT)

**T-BOAT HANDBOOK (Third Edition)  
 Annotated Table of Contents**

• This book familiarizes owners and officers of small passenger vessels (T-Boats) with *vessel inspection regulations*. It is not a ðlicense-prep book. However, individual chapters are available.

**Chapter 1 – Introduction to the Regulatory Process (RP)..... RP-1**  
 [This chapter describes federal rulemaking procedure including the ðauthorityö to make rules, steps in the process, and decision-making. It also describes the Code of Federal Regulations (CFR) by titles, subchapters, and parts in terms of material of concern to commercial boat operators in Titles 33, 46, and 49 CFR.]

**Chapter 2 – Rules and Regulations for Inspecting Small Passenger Vessels (RRT) .....(RRT)**  
 [This chapter details the author’s approach to the latest regulations in 46 CFR Subchapter T which contains Parts 175 through Part 185. This chapter is the same chapter we use in our Limited Master, Mate, and Operator Course to train all Masters of Small Passenger Vessels. We also include full coverage of the current multiple choice questions and answers used to prepare for this portion of the license exam.]

**Chapter 3 – Subchapter T According to the Coast Guard (ST) ..... (ST)**  
 [This chapter contains the same regulations taken directly from the Code of Federal Regulations. These regulations are subject to change at any time. Changes are published in the Federal Register. These changes are available from the Government Printing Office over the Internet. We follow these changes as well. This is why we encourage you to file a ðSummary of Changesö sheet when you purchase this book. Although we make no promises, it is to our mutual advantage as publisher and boat operator to keep posted on regulatory changes. Each purchaser should supply us with your e-mail address.]

**Chapter 4 – Comments on Various Topics ..... (COM)**  
 [Now that you are familiar with 46 CFR Parts 175 through 185, we move beyond the regulations to discuss a variety of subjects related to each of the Parts. Review the extensive ðChapter Contentsö on Page COM-1. We tell you what we know. We encourage you to tell us what you find out through your ðhard experienceö so we can share it with other readers via e-mail ó to the best of our ability. The good, the bad, and the ugly!]

**Chapter 5 – THE NTSB View of Small Passenger Vessel Regulations (N)..... (N)**  
 [The National Transportation Safety Board is an independent government agency that investigates certain

transportation-related accidents. Their Marine Department cut loose on the Coast Guard for their failure to address formal NTSB recommendations following a number of accidents. Sparks flew and the results were positive. The two agencies passed the peace pipe a few years later. That doesn't mean you can sit back and rest comfortably although Federal employees are likely to do just that unless they are challenged to serve the taxpaying public (i.e., you and I.)

**Chapter 6 – The Streamlined Inspection Program (SIP).....(SIP)**

[The way to avoid the anxiety of an annual Coast Guard Inspection is to keep your vessel in top shape every day it is in service. Read about the program that some companies use. It might fit your purposes if it is available in your area.]

**Chapter 7 – Subchapter T Index – Small Passenger Vessels (Less than 100 Gross Register Tons).....(IN)**

[The Coast Guard is responsible for updating the Index found at the end of Part 185 in the CFR. We got tired of reminding them to do it and updated it ourselves. The index is done by regulation number and not by page number. It is just one of the things you will have to get used to!]

**INFORMATION ON EXAM TOPICS LISTED IN  
FIGURE 1**

The details in the rest of this bulletin deal with where to find information about individual exam topics listed in **Table 11.910-2** (above) since much of this information is contained in the **individual chapters available from MET. MET publications cover many but not all exam topics.** Our recommendations are based upon our publications as well as those of other publishers.

**Additional Symbols**

★ These chapters also appear in our Able Seaman and Lifeboatman book.

† Additional publications, training charts or plotting tools are recommended for complete coverage of this subject.

[O/P]= Out of Print.

[T]= Towing. This subject is tested on towing vessel officer endorsements.

[R]= This subject is tested in a Navigation Rules (i.e., Rules of the Road) exam module.

[D]= This subject is tested in a "Deck - General" exam module.

[S]= This subject is tested in a "Deck - Safety" exam module.

[N]= This subject is tested in a "Navigation - General" exam module.

[P]= This subject is tested in a "Navigation Problems" exam module.

**The Coast Guard tests these topics & subtopics for both Near Coastal and Oceans (i.e., "celestial") endorsements:**

**PILOTING.** This subject includes the following sub-topics shown in CAPITAL letters:

- DISTANCE OFF.
- BEARING PROBLEMS.
- FIX OR RUNNING FIX.
- CHART NAVIGATION.
- DEAD RECKONING.
- TERRESTRIAL OBSERVATION.

**We recommend:**

Chart Navigation, (CNAV). Order MET Stock #BK-003C26.

Principles of Magnetic and Gyro Compasses, (COMP). Order MET Stock #BK-004C27.

Basic Piloting, (P) Order MET Stock #BK-005C28.

Chart Plotting, (PLOT) Order MET Stock #BK-005C29.

*[Comment: You will also need three specific training charts, plotting sheets, chartlets, and plotting tools specified in these chapters to solve plotting problems. We suggest you order them **after** you examine these chapters and are prepared to work on them. However, we will list these items as follow. **Comment: Students attending certain exam prep classes may be furnished some of these items.]***

NOS Training Chart #12354TR, Eastern Long Island Sound.

NOS Training Chart #13205TR, Block Island Sound.

NOS Training Chart #12221TR, Chesapeake Bay Entrance.

NOS Training Chart #1210TR, Martha's Vineyard to Block Island.

Reprints from Coast Pilot and Light List, Order MET Stock #BK-0276.

Reprints from the Tide Tables and Tidal Current Tables, Order MET Stock #BK-0276-1.

NOS Chart #1, Order MET Stock #BK-196.

**Recommended items:**

Ultralight Dividers, 7", Order MET Stock #PT-75.

Weems Parallel Plotter, Order MET Stock #PT-48.

15" Parallel Rulers, Order MET Stock #PT-03. Note that other sizes are available.

Maneuvering Board (pad), Order MET Stock #5090.

Graduated Navigation Triangles with handle, Order MET Stock #PT-10.

Nautical Slide Rule, Order MET Stock #PT-08.

General Scientific Calculator TI-30Xa, Order MET Stock #E-45 or TI-36X, MET Stock #E-47..

0.5 mm. Mechanical Lead Pencil, Order MET Stock #PT-53.

Pencil Lead (for above), Order MET Stock #PT-51.

Eraser, white vinyl, Order MET Stock #E-46.

Position Plotting Sheet #969 (27° to 30°). Order MET Stock #969.

**[Study Guide:** Unfortunately, piloting is often a difficult subject for a candidate studying for an original credential and is one of the reasons that many decide that they need the services of an instructor or tutor. Expect to devote considerable time to this subject if you are starting from scratch, out of practice, or developed bad habits.]

**ELECTRONIC NAVIGATION.** Included in this topic are GPS, Radio Direction Finding (RDF), Depth Sounders, Time Ticks and Automatic Identification Systems (AIS).

**We recommend:**

Electronic Navigation, (ENAV). MET Stock #BK-004C24. [**Comment:** This chapter reflects the fact that Loran and Omega questions are no longer asked. **Global Positioning System (GPS):** Although not listed in Table 11.910-2, there are a number of questions on GPS in the data bank and the topic is covered in the (ENAV) chapter.

**INSTRUMENTS & ACCESSORIES.** These topics appear under this topic.

RADAR.  
COMPASS.

**We recommend:**

Radar Observer Certificate. We recommend and publish **Radar Observer Manual**, 6<sup>th</sup>. Edition, by Samuel R. Pecota, MET Stock #BK-112. Capt. Pecota teaches the course at California Maritime Academy. You must attend an approved Radar Observer course for this endorsement. The National Maritime Center lists all approved courses available on the internet. Radar Observer is required for all towing credentials and most other credentials over 100 GRT.

Principles of Magnetic and Gyrocompasses, (COMP) Order MET Stock #BK-004C27.

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**AIDS TO NAVIGATION.**

**We recommend:**

Aids to Navigation, (A/N). Order MET Stock #BK-004C23. [**This chapter contains complete coverage of the subject for all endorsements.**]

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**CHARTS, NAVIGATION PUBLICATIONS, AND NOTICES TO MARINERS.**

**We recommend:**

Chart Navigation, (CNAV) Order MET Stock #BK-003C26 AND

Reference Publications, (PUB) Order MET Stock #BK-004C26. [**Comment:** The emphasis in limited tonnage endorsements is on using nautical charts published by the National Ocean Service (NOS). These charts are used in U.S. coastal waters, on the Great Lakes, on some rivers like the Hudson River below Albany, NY, the Mississippi River below Baton Rouge, LA, the Columbia River, and on the Intracoastal Waterway.

Since **some** candidates for **near-coastal or oceans** route endorsements **may** serve on foreign voyages and still remain within the route restrictions of their credentials, all candidates must be able to use charts and publications of the National Imagery and Mapping Agency (NIMA) or comparable publications of foreign governments. Consequently, you must be familiar with the charts and pubs in use throughout the world as well as in domestic waters.

The Coast Guard now uses **excerpts** from a **Reprints From the Light Lists and Coast Pilots**, COMDTPUB P16721.38. Order MET Stock #BK-0276. Approximately 30 introductory pages describe the aids to navigation system in use throughout the country. Much of the material in these introductory pages is also covered in our Aids to Navigation chapter(A/N) MET Stock #BK-004C23. No matter which source you use, be sure to read and study this material. However, you must access this "reprint" book in the exam room to work many exam problems. Consequently, you must be able to use not only the full reference publications at sea but also be prepared to use the "reprint" (in a slightly dif-

ferent format) in the exam room for reference during your exam. You must be able to look up answers to exam questions in this publication. The Coast Guard decided to use this consolidated reprint because these reference books are expensive and are revised every year or two. It became expensive and difficult to obtain outdated editions. This is a good book to share with others as it, like the training chart it is used with, is "frozen in time" and does not change. Wherever possible, however, examine, use, and study the current reference books on your boat.

Local Notice to Mariners (LNM). [**Comment:** As a credentialed Merchant Marine Officer, you are expected to keep up-to-date with all changes that affect the waterways and coastal waters you use. This "local notice" is published on a weekly basis by your Coast Guard District Commander. Call your District Headquarters Aids-to-Navigation office and ask to be added to their free computer updated list. All notices to mariners are only available electronically on the internet at:

[www.navcen.uscg.gov](http://www.navcen.uscg.gov).

U.S. Notice to Mariners. [**Comment:** The U.S. Notice to Mariners provides timely marine safety information for the correction of all U.S. Government navigation charts and publications from a wide variety of sources both foreign and domestic. To ensure the safety of life at sea, the information published in the Notice to Mariners is designed to provide for the correction of unclassified nautical charts, the Unclassified NGA/DLIS Catalog of Hydrographic Products, United States Coast Pilots, NIMA List of Lights, USCG Light Lists, and other related nautical publications produced by NGA, NOS and the USCG. The U.S. Notice to Mariners corrects NGA and NOS charts using information collected from many sources, among them the Local Notice to Mariners published by the various U.S. Coast Guard districts. However, the **U.S. Notice to Mariners contains only those chart corrections of interest to ocean going vessels**. Copies of the U.S. Notice to Mariners dating back to issue 29/1999 are available on the internet for viewing and downloading.]

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**WATCHKEEPING.** Includes these subtopics:

**COLREGS.** (NR) The COLREGS are the rules of the road that apply in "international waters" and outside the lines of demarcation. They also apply to the waters of Alaska, Puget Sound, northeast Maine, and certain other places. [**Please continue reading the next paragraph.**]

**INLAND NAVIGATIONAL RULES. (NR)**

**We recommend:**

Navigation Rules for International and Inland Waters including the Great Lakes & Western Rivers (i.e., our Nav. Rules chapter). Order MET Stock #BK-234. [**Comment:** The current inland navigational rules went into effect in Dec. 1981 and on the Great Lakes in 1983 replacing earlier rules. The international collision regulations (COLREGS) were in effect outside the "lines of demarcation" since 1977. Both sets of rules and their Annexes were amended a number of times since their introduction. As of April 15, 2010, the Inland Rules were removed from the U.S. Code and are now a part of Title 33, Code of Federal Regulations.

All deck officers, operators, and able seamen are

tested on the "rules of the road." Coast Guard regulations at 33 CFR 88.05 (BK-678) also require the operator of each self-propelled vessel 12+ meters in length to have a current copy of the Coast Guard's inland rules on board his vessel.

The main purpose of our chapter is to help you prepare for a Coast Guard exam or renewal exercise. This is a specialized book designed to help you master the navigation rules in which ...

- We **compare** the Colregs with the inland rules on a line-by-line basis and highlight words, phrases, and punctuation where the two versions of the rules differ.
- We **combine** the Colregs and inland rules wording where they are identical to simplify studying the two versions!
- We **explain** the meaning of words and phrases used in the rules.
- We **point out** "trick" questions and reveal the tricks.
- We **organize** questions and answers in a logical order according to their rule number and according to degree of difficulty within each rule.
- We processed all 1055 existing Coast Guard multiple choice questions with correct answers, explanations, and referenced to their source.
- We included all diagrams from the Merchant Marine Deck License Examination Illustration Book (MET Stock #BK-678).
- We **referenced** answers with rule numbers so you can check incorrect answers against the rule itself.
- We **cited** Coast Guard question numbers so you can help us correct an occasional incorrect or misleading exam question.
- We **incorporated** all inland rules and Colregs changes to the date of publication.

#### BASIC PRINCIPLES OF WATCHKEEPING.

We recommend:

Basic Principles of Watchkeeping, (WAT) Order MET Stock #BK-002C12. [Comment: This chapter includes a discussion of STCW watchkeeping principles.]

NAVIGATION SAFETY REGULATIONS, 33 CFR Part 164 which you can find on the Electronic Code of Federal Regulations website <http://www.ecfr.gov>.

#### RADAR OBSERVER CERTIFICATE.

We recommend:

Radar Observer Manual, MET Stock #BK-112. [Comment: When you obtain your Master or Mate endorsement, it will not be valid for service on vessels larger than 300 gross tons or for service on any towing vessel greater than 26 feet unless and until you also obtain a currently valid Radar Observer's endorsement. You must attend a Coast Guard approved radar observer course to obtain this endorsement and must renew that endorsement every five years by attending a refresher course. Our Radar Observer Manual, is used in many radar schools. However, the school you attend often provides the book as a part of its tuition or sells this or a comparable book to incoming students. Further information on sources of approved radar training is available from the National Maritime Center list of approved courses as mentioned above.]

**COMPASS – MAGNETIC & GYRO.** Includes these

subtopics:

PRINCIPLES OF GYROCOMPASS. [This topic is for endorsements of 200 tons and above.]

PRINCIPLES OF THE MAGNETIC COMPASS.

MAGNETIC COMPASS ERROR/CORRECTION.

GYRO COMPASS ERROR/CORRECTION.

We recommend:

Principles of Magnetic and Gyrocompasses, (COMP)

Order MET Stock #BK-004C27 for all endorsements.

MAGNETIC COMPASS ADJUSTMENT.

Bowditch, N. The American Practical Navigator.

[Comment: The gyrocompass and the laws of physics that cause it to operate are quite complex. An excellent description, which must be read carefully to be understood even marginally, appears in Bowditch. The 2002 edition of "Bowditch," which belongs in the library of professional mariners, is available as MET Stock #PUB9 and is one of our best book values. It is, however, written at the college level. Few questions appear in the Coast Guard exam question bank concerning the principles (i.e., theory) of the gyrocompass although there are many "practical" gyrocompass correction questions.]

GYRO-CONTROLLED SYSTEMS.

OPERATION AND CARE OF MAIN GYRO SYSTEMS. [Comment: On some vessels, the master gyrocompass drives a number of "repeaters," controls the automatic pilot, and may be attached to other electronic and electro-mechanical systems. Factory technical manuals and operator guides rather than textbooks generally provide the specifics on the driven equipment. Judging by the shortage of questions on this subtopic, the Coast Guard is discovering the shortage of universally accepted publications.]

**METEOROLOGY & OCEANOGRAPHY:** Includes these subtopics:

CHARACTERISTICS OF WEATHER SYSTEMS.

We recommend:

Weather Systems and Forecasting, (W) Order MET Stock #BK-004C21 and

The Golden Guide to Weather, MET Stock #BK-330.

Modern Marine Weather by David Burch, MET Stock #BK-1047.

**OCEAN CURRENT SYSTEMS.**

We recommend:

Ocean Current Systems, (OCS) Order MET Stock #BK-007C45. [Comment: This chapter contains an excerpt from "Bowditch" plus the applicable questions and answers.]

• **WEATHER CHARTS AND REPORTS.**

We recommend:

• Bowditch, N. The American Practical Navigator, MET Stock #PUB9. [Comment: This topic is also known as "Synoptic Chart Weather Forecasting."]

• Modern Marine Weather by David Burch, MET Stock #BK-1047.

**TIDES & TIDAL CURRENTS** Includes these subtopics:

• EXTENSIVE TIDAL EFFECTS.

• TERMS AND DEFINITIONS.

• PUBLICATIONS AND CALCULATIONS.

We recommend:

- Tide and Tidal Current Publications, (TCP) Order MET Stock #BK-005C30 AND
- Tide and Tidal Current Calculations, (TCC) Order MET Stock #BK-005C31. [*Comment: This chapter works out samples of many Coast Guard tide and tidal current problems. Expect to spend considerable time on this subject.*]

**SEAMANSHIP:** Includes these subtopics:

- MARLINSPIKE SEAMANSHIP
- PURCHASES, BLOCKS AND TACKLE

**We Recommend:**

- Marlinspike Seamanship, Purchases, and Safe Practices, (SEA). Order MET Stock #BK-002C08.

**SHIP MANEUVERING & HANDLING:** Includes these subtopics:

- APPROACHING PILOT VESSEL OR STATION.
- SHIPHANDLING IN RIVERS & ESTUARIES.
- MANEUVERING IN SHALLOW WATER.
- INTERACTION WITH THE BANK AND PASSING SHIPS.
- BERTHING & UNBERTHING.
- SMALL BOAT HANDLING UNDER OARS & SAIL.

**We recommend:**

- Maneuvering and Handling, (M&H) Order MET Stock #BK-002C10. [*Comment: MacElrevey, D. Shiphandling for the Mariner, 2<sup>nd</sup> edition, MET Stock #BK-492 has in-depth coverage of these subtopics.*]

• **MANEUVERING FOR LAUNCHING LIFEBOATS AND LIFERAFTS IN HEAVY WEATHER.**

**We recommend:**

- Lifeboatman, Rev. Edition "E", (LB) Order MET Stock #BK-105-1.

• **RECEIVING SURVIVORS FROM LIFEBOATS AND LIFERAFTS.**

**We recommend:**

- First Aid and Medical Care, (FA) Order MET Stock #BK-001C04 and
- Survival at Sea, (SAS). Order MET Stock #BK-002C15.
- Maneuvering and Handling. (M&H). Order MET Stock #BK002C10.
- GENERAL TURN CIRCLE, PIVOT POINT, ADVANCE & TRANSFER. and
- DETERMINE MANEUVERING CHARACTERISTIC OF MAJOR VESSEL TYPES. Noel, J.V. Knight's Modern Seamanship, MET Stock #BK-258. For in depth study, Hooyer, H.H. Behavior and Handling of Ships, MET Stock #BK-577.

• **ANCHORING & MOORING.**

- DRAGGING, CLEARING FOULED ANCHORS.

**We recommend:**

- Anchoring and Mooring, (A&M). Order MET Stock #BK-002C09.

• **DRYDOCKING WITH & WITHOUT PRIOR DAMAGE.**

**We recommend:**

- Maneuvering and Handling, (M&H). Order MET Stock #BK-002C10. [*Comment: Also refer to Knight's Modern Seamanship, 18th edition, MET Stock #BK-258, pages*

*81-87, and/or Turpin and MacEwen, Merchant Marine Officers' Handbook, MET Stock #BK-241, pages 14-62 through 14-68 inclusive if you have had limited practical experience in these matters. Note that the exam question bank appears to have only a few specific questions on this subtopic.*]

• **HEAVY WEATHER OPERATIONS.**

**We recommend:**

- Maneuvering and Handling, (M&H) Order MET Stock #BK-002C10. [*Comment: Also refer to Chapman's Piloting, Seamanship and Small Boat Handling, 64th edition, Chapter 10, (MET Stock #BK-150), Special Seamanship Techniques for small craft.*]

• **WAKE REDUCTION.**

**We recommend:**

- Maneuvering and Handling, (M&H) Order MET Stock #BK-002C10.

• **ICE OPERATIONS/ICE NAVIGATION.**

**We recommend:**

- Ice Operations and Ice Navigation, (ICE) Order MET Stock #BK-006C39. [*Comment: This chapter is based on Bowditch, but also contains applicable questions and answers. "Bowditch" is often available aboard ship and may be available in many public libraries – although not always its latest edition. But, Coast Guard exam questions don't always come from the latest editions either!*]

• **TOWING OPERATIONS.**

**We recommend:**

- Towing Operations, (TOPS) Order MET Stock #BK-007C05. This chapter is contained in the Towing Vessel Officer's Guide.

**SHIP STABILITY, CONSTRUCTION & DAMAGE CONTROL:**

Includes these subtopics:

- PRINCIPLES OF SHIP CONSTRUCTION.
- VESSEL STRUCTURAL MEMBERS.

**We recommend:**

- Baker, E, Introduction to Steel Shipbuilding, 2<sup>nd</sup> edition, MET Stock #BK-381 (Out of Print); OR
- Taylor, D.A., Merchant Ship Construction, 3<sup>rd</sup> ed. MET Stock #BK-0268; OR
- Pursey, H.L., Merchant Ship Construction, 7<sup>th</sup> ed., MET Stock #BK-169.
- Eyres, D. J., Ship Construction 4<sup>th</sup> ed. MET Stock #BK-235.

• **TRIM AND STABILITY.**

• STABILITY, TRIM & STRESS CALCULATIONS.

[*Comment: The Coast Guard's module documentation sheet lists the following subtopics for this endorsement: GM Calculations; Free Surface; Draft Density; and List.*]

**We recommend:**

- Practical Stability, (STAB) Order MET Stock #BK-001C07. [*Comment: This chapter contains useful introductory material and provides detailed solutions (not just "answers") to most of the stability problems lower-level endorsement candidates will have on their exams.*]
- George, W.E., Stability and Trim for the Ship's Officer,

3rd. ed., MET Stock #BK-175, for upper-level endorsements.

**[Study Guide: MET Guidance on math-oriented stability exam questions:**

- **For endorsements to 100 Gross Tons:** "The problems in the exam for a (endorsements) of not more than 100 gross tons are based on the use of the Stability Letter." [Source: G-MVP-5 letter to MET dated Jan. 29, 1992.]
- **For endorsements to 200 Gross Tons:** "The stability questions used in (this) examination...require the applicant to determine information necessary to use a Stability Letter,...to determine the detrimental effects of free surface, and...(use) the rule-of thumb formula to determine GM from rolling period." [Source: G-MVP-5 letter, dated Nov. 19, 1991, to MET.]
- **For endorsements of 500 or 1,600 gross tons:** "A vessel of 1,600 gross tons and normal proportions can measure more than 250 feet in length and is capable of extended operations. The masters must **fully understand** the topic of stability. In addition to the calculations required for a 200 gross ton endorsement, the applicant is expected to be able to calculate the angle of list from off-center weight. The significant test difference is that a master 1,600 gross tons is expected to have a broader grasp of the definitions, theory, and application of the principles of stability. In general, our present questions are still linked to the use of a Stability Letter. The current trend for vessels in this size range is to carry a stability book. The Deck Section is studying this trend to determine if our present questions are adequate and what changes, if any, should be made to the test questions." [Source: G-MVP-5 letter, to MET, dated Jan. 29, 1992.]

- **DAMAGE TRIM AND STABILITY.**
- **DAMAGE CONTROL.**

**We recommend:**

- George, W.E., Stability and Trim for the Ship's Officer, 3<sup>rd</sup> edition, MET Stock #BK-175 AND
- Bissel, Oertel & Livingston, Shipboard Damage Control, MET Stock #BK-954. (Out of Print)
- CHANGE IN DRAFT DUE TO DENSITY.

**We Recommend:**

- Ships Business, (SB) Order MET Stock #BK-006C34, under the heading of "Load Lines".

**SHIP POWER PLANTS.** Includes these subtopics:

- MARINE POWERPLANT OPERATING PRINCIPLES.
- MARINE ENGINEERING TERMS.

**We recommend:**

- Workboat Engineer and Oiler, MET Stock #BK-107-1 and #BK-107-2 and #BK-107-3. [Comment: This set of three volumes was specifically written for engineers and oilers serving on vessels less than 1,600 gross tons in the offshore oil and towing industries. It is also useful for engine-ratings on all towing vessels. Also refer to Maleev, V.L., Diesel Engine Operation and Maintenance, MET Stock #BK-380.(Out of Print)

Before spending a lot of money on preparing for this topic, we found very few questions on this subject in the existing question bank. This fits in with 46 USC 8104(e)(1)(A) that states that "...a seaman may not be engaged to work alternately in the deck and engine de-

partments..." and the Coast Guard's policy of keeping the engine and deck departments separate. It reinforces our behalf that the USCG chooses to remain ignorant of operational realities on many smaller vessels and has chosen to remain so. Refer to NMA Report #R-279, Rev 8, Request to Congress: To Review and Set Safe Manning Standards for Mariners Serving on Towing and Offshore Supply Vessels.

**• SHIP'S AUXILIARY MACHINERY.**

**We recommend:**

- Auxiliary Machinery, (AUX) Order MET Stock #BK-107C07. [Contents: This chapter is taken from our Workboat Engineer textbook and is based on equipment found on tugs and offshore supply vessels. See note on Ship's Power plants (above).]

**• SMALL ENGINES OPERATION & MAINTENANCE.**

**We recommend:**

- Ships Power Plants, (ENG). Order MET Stock #BK-003C20. This information applies primarily to small passenger vessels under 100 gross tons.

**CARGO HANDLING AND STOWAGE.** Includes these subtopics:

- CARGO STOWAGE & SECURITY. Including CARGO GEAR.
- LOADING & DISCHARGING OPERATIONS.

**We recommend:**

- Cargo Handling and Stowage, (CHS) Order MET Stock #BK-007C41. [Comment: For in-depth coverage of this topic on vessels other than Offshore Supply Vessels we recommend Sauerbier and Meurn, Marine Cargo Operations, MET Stock #BK-256.]
- Taylor, L. G. Cargo Work, 12<sup>th</sup>. Ed. MET Stock #BK-888.
- Rankin, K. S., Thomasø Stowage, 4<sup>th</sup> Ed. MET Stock #BK-479.
- INTERNATIONAL REGULATIONS FOR CARGOES, ESPECIALLY IMDG. [Comment: U.S. regulations for the transportation of hazardous materials are being brought into line with international regulations. Hazardous materials are either shipped in "bulk" or in "package" size lots. For bulk shipments, know how to use Chemical Data Guide for Bulk Shipment by Water, COMDTINST M16616.6A (1990 ed). Order MET Stock #BK-202-90. For package shipments, refer to 49 CFR Parts 172 and 176 on the internet.

IMDG refers to the International Maritime Dangerous Goods Code, MET Stock #BK-545. However, this publication, like most IMO books, is not listed as a reference book available in the exam room. In light of these facts, which are subject to change at any time, do not expect many "international" questions on this subtopic since most U.S. and International regulations parallel each other. Each nation enforces international conventions by means of its own national regulations. **Consequently, exam questions are based on applicable U.S. regulations.**

- DANGEROUS/HAZARDOUS CARGO REGULATIONS. [Study Guide: A review data bank of test questions shows a number of questions on this subtopic. All

of the applicable regulations in the CFR as well as the Chemical Data Guide for Bulk Shipment by Water, MET Stock #BK-202-90 are available in the exam room and may be used for reference during the exam. In fact, for most questions of this nature, you **must** use these reference publications to find the correct answer to exam questions.]

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### **TANK VESSEL SAFETY.**

Related subtopics include:

CARGO PIPING AND PUMPING SYSTEMS.  
CARGO OIL TERMS AND DEFINITIONS.  
BALLASTING, TANK CLEANING AND GAS FREE OPERATIONS.  
LOAD ON TOP PROCEDURES. [This subtopic was withdrawn as the procedure is no longer used.]  
BARGE REGULATIONS.

#### **We recommend:**

Operational Safety Information, (OSI). Order MET Stock #BK-006C37.  
Tank Safety, (TS). Order MET Stock #BK-004C39.

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### **FIRE PREVENTION & FIREFIGHTING APPLIANCES.**

Includes these subtopics...

ORGANIZATION OF FIRE DRILLS.  
CLASSES AND CHEMISTRY OF FIRES.  
FIREFIGHTING SYSTEMS.  
FIREFIGHTING EQUIPMENT & REGULATIONS.  
BASIC FIREFIGHTING AND PREVENTION.  
FIREFIGHTING EQUIPMENT AND REGULATIONS FOR T-BOATS.

#### **We recommend:**

Fires, Firefighting and Fire Prevention, (FF) Order MET Stock #BK-003C19. [Study Guide: If you plan to take firefighting training, we recommend Marine Fire Fighting, First Edition, MET Stock BK-0912.  
Marine Fire Fighting for Land-Based Firefighters, 1<sup>st</sup> Ed. MET Stock #BK-0923.  
Marine Fire Prevention, Fire Fighting and Fire Safety, MET Stock #BK-219 (Out of Print). [Comment: A list of USCG approved fire fighting courses is available from the National Maritime Center.]

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### **EMERGENCY PROCEDURES. Includes these subtopics:**

SHIP BEACHING PRECAUTIONS.  
ACTIONS PRIOR TO AND AFTER GROUNDING.  
REFLOATING A GROUNDING SHIP.  
COLLISION.  
TEMPORARY REPAIRS.  
PASSENGER & CREW SAFETY IN AN EMERGENCY.  
FIRE OR EXPLOSION.  
ABANDON SHIP PROCEDURES.  
EMERGENCY STEERING.  
RESCUING SURVIVORS FROM SHIPS AND AIRCRAFT IN DISTRESS.  
MAN OVERBOARD PROCEDURES.

#### **We recommend:**

Maneuvering & Handling, (M&H). MET Stock #BK-002C10.  
Emergency Procedures, (EMER). Order MET Stock #BK-002C14.  
Temporary Repairs, (TR). Order MET Stock #BK-006C36.

### **• EMERGENCY TOWING.**

**We recommend:**

- Towing Operations, (TOPS). Order MET Stock #BK-007C05.
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### **MEDICAL CARE.**

[Study Guide: For many credentials, knowledge beyond basic first aid is required. STCW requirements include attendance at formal medical care courses that are generally available at union schools, academies, and some private schools. Course listings are available from the National Maritime Center. The Coast Guard data bank has many "first aid" questions, and it is hard to tell where these questions blend into larger term "medical care." Four subtopics listed under "Medical Care" happen to refer to three separate BOOKS that are available commercially and are as follows:]

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### **INTERNATIONAL MEDICAL GUIDE FOR SHIPS.**

**We recommend:**

International Medical Guide for Ships, MET Stock #BK-503.

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### **SHIP'S MEDICAL CHEST AND MEDICAL AID AT SEA.**

**We recommend:**

Ship's Medical Chest and Medical Aid at Sea, MET Stock #BK-201. (**OUT OF PRINT**) [Study Guide: This book appears to be the source of many questions. However, it is no longer in print and was replaced by the World Health Organization's International Medical Guide for Ships, MET Stock #BK-503.]

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### **MEDICAL SECTION OF THE INTERNATIONAL CODE OF SIGNALS.**

**We recommend:**

International Code of Signals, MET Stock #PUB102. [Study Guide: When using this publication, refer to its "Medical Section". The Coast Guard question bank contains a number of questions that require you to know how to use this publication to send a message dealing with medical matters by various means. This publication is available in the exam room for your reference and is required on inspected vessels engaged on international voyages. So, if applicable, be sure you know how to use it to send a medical message.]

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### **FIRST AID GUIDE: ACCIDENTS WITH DANGEROUS GOODS.**

**We recommend:**

IMO Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG), MET Stock #BK-442. (**OUT OF PRINT**) Use MET Stock # BK-545-SUP. [Study Guide: The key to this publication lies in the term "dangerous goods" that you can interpret to include all types of nasty chemicals. It covers its limited subject area well. However, this book is not in the list of reference books supplied to the REC. Consequently, the only place you can look up the first aid treatment for a specific chemical is in one line of the Chemical Data Guide for Bulk Shipment by Water that is provided in the exam room. So, use this reference book to answer any test questions of this nature.]

### FIRST AID.

#### **We recommend:**

First Aid and Medical Care, (FA). Order MET Stock #BK-001C04. [**Comment:** *In addition to the first aid course you are now required to attend for an original credential, you still will be tested in First Aid on your exam. We have urged that "double testing" on this and other topics be ended. We have noticed that the Coast Guard data bank also contains a number of questions on Cardiopulmonary Resuscitation (CPR). These questions may appear on your exam as well even though you have obtained a CPR card. The primary source of these CPR questions appears to be The Ship's Medicine Chest mentioned earlier. If you find an exam question that does not "square" with current CPR doctrine being taught, be sure to "protest" the question in writing before you leave the exam room citing the specifics you learned in class.]*

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**INTERNATIONAL MARITIME LAW.** (IMO). Order MET Stock #BK-007C43. This topic includes five subtopics:

[**Study Guide:** *These topics that are covered by publications of the International Maritime Organization (IMO), an agency of the United Nations headquartered in London. These publications are **not** available in the exam room. However, you should be aware that international regulations are not enforced directly. They are enforced by U.S. statutes and Coast Guard regulations scattered throughout various volumes of the Code of Federal Regulations. This is one reason why you must learn to use Titles 33, 46 and, to a limited extent, 49 CFR!*

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### **INTERNATIONAL CONVENTION ON LOAD LINES. We recommend:**

Ship's Business, (SB). Order MET Stock #BK-006C34. [**Study Guide:** *This chapter has a section including questions and answers on load lines. U.S. load line regulations, that parallel the international regulations, appear in the Code of Federal Regulations at 46 CFR Parts 41-47 and are available in the exam room and on the internet. For in-depth study, consult Load Line Conference-1966, MET Stock #BK-498.]*

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### **SOLAS.**

#### **We recommend:**

International Maritime Organization, MET Stock #BK-005C44. [**Study Guide:** *For in-depth study, we recommend Safety of Life at Sea (SOLAS), 2004 consolidated edition, MET Stock #BK-280-01. SOLAS standards apply to inspected on an international (i.e., foreign) voyage.]*

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### **MARPOL 73/78.**

#### **We recommend:**

International Maritime Organization, MET Stock #BK-007C43. [**Study Guide:** *For in-depth study, we suggest MARPOL 73/78 MET Stock #BK-453-X. 2011 Consolidated Edition. Since MARPOL is a longstanding U.S. treaty obligation, merchant marine officers with credentials to operate in international waters are expect-*

### **INTERNATIONAL HEALTH REGULATIONS.**

#### **We recommend:**

Ship's Business, (SB). Order MET Stock #BK-006C34. [**Study Guide:** *There are only a few questions in this area that go beyond questions in First Aid and Medical Care, MET Stock #BK-001C04. For in-depth study, we suggest International Health Regulations, MET Stock #BK-393 published by the World Health Organization.]*

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**OTHER INTERNATIONAL INSTRUMENTS FOR SHIP, PASSENGER, CREW AND CARGO SAFETY.** We never received further information or guidance from the Coast Guard as to what this catchall entry might cover.

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**NATIONAL MARITIME LAW:** Includes these subtopics: **LOAD LINES.** See **INTERNATIONAL CONVENTION ON LOAD LINES** (above).

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### **CERTIFICATION & DOCUMENTATION OF VESSELS.**

#### **We recommend:**

Ship's Business, (SB). Order MET Stock #BK-005C34. [**Study Guide:** *This chapter contains a section on vessel documentation. Your exam will contain a number of questions that may require you to use reference books in the exam room. You can research the few questions on **DOCUMENTATION** in 46 CFR Parts 67, 68, and 69 on the internet. For "CERTIFICATION," please read on.]*

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### **RULES AND REGULATIONS FOR INSPECTED VESSELS.**

#### **We recommend:**

T-BOAT HANDBOOK, MET Stock #BK-115. Rules and Regulations for Offshore Supply Vessels, (OSV). Order MET Stock #BK-007C40. [**Study Guide:** *This chapter gives an overview of the regulations of "Subchapter L – Offshore Supply Vessels" and will help you understand what this representative set of vessel inspection regulations is all about. For in-depth study, you will find several sets of vessel inspection regulations in 46 CFR Parts 90-139 on the internet website.. Since you must learn how to use the Code of Federal Regulations, you should spend a suitable amount of time reviewing the format and contents of this publication while you are on board your vessel.*

*Unfortunately, not all "inspected" vessels are regulated by Subchapter L. Tank vessels, for example, are governed by the regulations of Subchapter D while passenger vessels larger than 100 gross tons are regulated by Subchapter H; new offshore supply vessels are governed by Subchapter L. Yet many of the exam questions on "rules and regulations" reference Subchapter I (Cargo and Miscellaneous Vessels). If you can have little or no experience with vessel inspection regulations, we suggest that you back track and start from the beginning by reading: Rules and Regulations for Uninspected Vessels, MET Stock #BK-003C16 and Rules and Regulations for Small Passenger Vessels, MET Stock #BK-003C17. This will give you sufficient background information to understand **any** set of vessel inspection regulations since different*

*regulations often parallel each other.]*

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### **POLLUTION PREVENTION REGULATIONS.**

#### **We recommend:**

Pollution Control, (PC). Order MET Stock #BK-001C05. *[Study Guide: Our chapter covers OPA-90 and MARPOL 73/78 as well as marine sanitation devices and garbage disposal regulations. This chapter ison target for all credentials and endorsements.]*

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#### ● PILOTAGE.

#### **We recommend:**

Pilotage, (PIL). Order MET Stock #BK-007C08 for towing vessels. *[Study Guide: Many Masters of seagoing vessels are surprised to find that they must have pilotage authority in addition to their Master's endorsement. For in-depth study, you will find the matter is complicated and best explained in these documents. Report of the Pilotage Study Group, MET Stock #R-25 is a government study that attempted to clarify the matter in 1989 while NVIC 8-94 contains later clarifications.]*

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### **LICENSING AND CERTIFICATION OF SEAMEN.**

#### **We recommend:**

Coast Guard Credentialing Information, (CRED). Order MET Stock #BK-001C01. *[Study Guide: For in-depth study, Title 46, Code of Federal Regulations, Parts 10, 11, 12, 14, 15, and 16 on the GPO access internet website that contains the current regulations that affect "Licensing," the "Certification of Seamen," "Manning," and "Chemical (i.e., drug) Testing."]*

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### **SHIPMENT AND DISCHARGE OF SEAMEN.**

#### **We recommend:**

Ship's Business, (SB). Order MET Stock #BK-006C34. *[Study Guide: This topic is covered exclusively by Navigation and Vessel Inspection Circular #1-86 that we reprinted in this chapter along with all the applicable questions.]*

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### **MANNING.**

#### **We recommend:**

Manning, (MAN). Order MET Stock #BK-001C03 **and** (MTV) Order MET Stock #BK-007C02 for towing vessels. *[Study Guide: See "Licensing and Certification of Seaman" above. All Coast Guard manning regulations are contained in 46 CFR Part 15.]*

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### **TITLE 46 U.S. CODE.**

#### **We recommend:**

National Maritime Law, (LAW). Order MET Stock #BK-007C42 AND

United States Code Annotated 6 Title 46, MET Stock #BK-697. *[Study Guide: This reference book is used by attorneys. Unfortunately, the 2010 edition is the last one in print and the publisher has discontinued it. The U.S. Code is available on the internet. However, protest any direct exam questions that require you to use the U.S. Code if this reference is not provided in the exam room.]*

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### **CAPTAIN OF THE PORT REGULATIONS,**

### **VESSEL TRAFFIC SERVICE PROCEDURES FOR THE ROUTE DESIRED.**

#### **We Recommend:**

Coast Guard Vessel Traffic Management regulations are contained in 33 CFR Part 161. It is available on the GPO Access internet website. Most Vessel Traffic Services publish information booklets with maps and other guidance available free of charge. We maintain some of these publications in stock. However, any exam question on Vessel Traffic Management should be based on national rather than local regulations.

Ships Routing, MET Stock #BK-708 and (computer disk) CD-008, is an IMO loose leaf publication that gives details of international ship routing schemes in use by international agreement throughout the world.

Captain of the Port Regulations are available from local Coast Guard Sector Offices. Do not expect these local regulations to be tested on a national exam prepared by the National Maritime Center.

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### **SHIPBOARD MANAGEMENT AND TRAINING.**

Includes these subtopics:

PERSONNEL MANAGEMENT.  
SHIPBOARD ORGANIZATION.  
REQUIRED CREW TRAINING.

#### **We recommend:**

Emergency Procedures, (EMER). Order MET Stock #BK-002C14.

Rules and Regulations for Small Passenger Vessels, (RRT). Order MET Stock #BK-003C17, especially sections dealing with 46 CFR parts 180, 184 and 185.

*[Study Guide: Although these chapters apply to required crew training on vessels less than 200 gross tons, expanded and improved crew training has characterized all new regulations in recent years. This trend will continue with the implementation of the Seafarers Training, Certification, and Watchkeeping Code (1995). The STCW Code is now in full effect and will apply to credentials authorizing service on vessels over 200 tons in use outside the "boundary lines" described in 46 CFR Part 7. When operating offshore, all mariners must have taken formal in*

*Basic Training in these areas:*

- Personal survival techniques (STCW Table A-VI/1-1)<sup>(1)</sup>
- Fire prevention and firefighting (STCW Table A-VI/1-2)<sup>(1)</sup>
- Elementary first aid (STCW Table A-VI/1-3)<sup>(1)</sup>
- Personal safety and social responsibilities (STCW Table A-VI/1-4).<sup>(1)</sup> This topic includes these subtopics: Compliance with emergency procedures; pollution prevention; safe working practices; ability to understand orders and be understood; and the need to contribute to effective human relationships on board ship.

*[Source: 62 FR 34520, 34538, June 26, 1997 and STCW Order MET Stock #BK-452 & BK-452-01 AMENDMENT]*

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### **SHIP SANITATION.**

#### **We recommend:**

Ship Sanitation, (SS). Order MET Stock #BK-006C35.

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### **VESSEL ALTERATION, REPAIR & HOT WORK.**

#### **We recommend:**

Eyres, D.J., Ship Construction, MET Stock #BK-235.

Pursej, H.J., Merchant Ship Construction, MET Stock #BK-169.

*[Study Guide: Also refer to 46 CFR 91.43, 91.45, 91.50 and 91.55 contained in 46 CFR 90-139 (internet) and to the provisions of the latest edition of the Standard for the Control of Gas Hazards on Vessels to be Repaired, NFPA #306 available on (special order).]*

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**SAFETY.** All our study material routinely emphasizes safety. We have no separate chapter or book to recommend.

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**SHIP'S BUSINESS.** Includes these subtopics:

CHARTERS.  
LIENS AND SALVAGE.  
INSURANCE.  
ENTRY AND CLEARANCE.  
CERTIFICATES AND DOCUMENTS REQUIRED.

**We recommend:**

Ship's Business, (SB). Order MET Stock #BK-006C34.  
*[Study Guide: For in-depth study, consult Messer, T.A., Shipmaster's Handbook on Ship's Business, 3<sup>rd</sup> Edition, MET Stock #BK-173.]*

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**COMMUNICATIONS.** Includes these subtopics:

RADIOTELEPHONE COMMUNICATIONS.

**We recommend:**

Radiotelephone Communications, (C). Order MET Stock #BK-002C13. *[Study Guide: This chapter covers most immediate needs for the Coast Guard exam. You will be tested on this subject, especially areas dealing with the Bridge-to-Bridge Radiotelephone Act enforced by the Coast Guard even though you may have an appropriate FCC license.*

*New regulations based on the 1995 STCW Code appear at 46 CFR §11.604 and provide this information concerning radio operations under GMDSS that went into effect on February 1, 1999. Masters operating in GMDSS will have to take an "approved course" complying with STCW Table A-IV/2<sup>(1)</sup> to meet the GMDSS requirements. This table appears in STCW, MET Stock #BK-452, and is available separately as MET Document #R-165. 46 CFR §11.604 is cited below:*

**§11.604 Requirements for an STCW endorsement for Global Maritime Distress and Safety System (GMDSS) radio operators.**

Each applicant for an original endorsement must present a certificate of completion from a Coast Guard-approved course for operator of radio in the GMDSS meeting the requirements of Section A-IV/2 of the STCW Code (incorporated by reference, see §11.102 of this part).

SIGNALS: STORM, WRECK, DISTRESS, SPECIAL.

**We recommend:**

Lifeboatman, (LB). Order MET Stock #BK-105-1.  
INTERNATIONAL CODE OF SIGNALS.

**We recommend:**

Signaling, (SIG) MET Stock #BK-007C44. *[Study Guide: For in-depth study also consult the International Code of Signals, MET Stock #PUB102 (available on vessels on an international voyage). Knowledge of Morse Code is now tested only on endorsements to serve on vessels greater than 200 tons in a "flashing light" test.]*

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**LIFESAVING.** Includes these subtopics:

SURVIVAL AT SEA.  
LIFESAVING APPLIANCE REGULATIONS.  
LIFESAVING APPLIANCE OPERATION.

**We recommend:**

Lifeboatman, (LB). Order MET Stock #BK-105-1.  
*[Study Guide: This book includes complete information on the 2003 revision of the lifesaving regulations that now appear at 46 CFR Part 199. Also; for in extended study, we recommend Meurn, R. J., Survival Guide for the Mariner, MET Stock #BK-0257.]*

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**SEARCH AND RESCUE PROCEDURES.**

**We recommend:**

IMO IAMSAR MANUAL Volume 3. MET Stock #BK-0852-3

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**AMVER.**

**We recommend**

• Automated Mutual Assistance Vessel Rescue System (AMVER). Order MET Stock #BK-007C47.  
Lifesaving Appliance Regulations for T-Boats. (LST), Order MET Stock #BK-003C18.

**We recommend**

T-Boat Handbook, MET Stock #BK-115, Lifesaving Appliance Operations for Small Passenger Vessels (T-Boats).

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**SAIL & AUXILIARY SAIL VESSELS ADDENDUM.**

**We recommend:**

Sail and Auxiliary Sail Addendum, (SAIL). Order MET Stock #BK-002C11.  
Chase, G. A., Auxiliary Sail Vessel Operations, 1<sup>st</sup> Ed. MET Stock #BK-0709.

*[Study Guide: An "endorsement" is required to operate a sail or auxiliary sail vessel carrying passengers for hire. The difference between a sailing vessel and an auxiliary sailing vessel is that the latter has an auxiliary means of propulsion (i.e., an engine).*

*Refer to the "Sea Service Requirements Regulations" for endorsements for service on vessels of 200 gross tons or less.*

*If you want a sail/auxiliary sail endorsement, you must take a separate exam module that is added to any exam of the appropriate route and gross tonnage. The passing grade on this module is 70%. Consult endnote 8 to Table 11.910-2 describing the addendum. Applicants for sail/auxiliary sail endorsements Master, Mate or operator of uninspected passenger vessels endorsements are also tested in the subjects contained in the addendum."]*

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**ANY SUBJECT CONSIDERED NECESSARY TO ESTABLISH THE APPLICANT'S PROFICIENCY.**

*[Study Guide: This heading is shown as a separate subtopic on every examination.*

*To the best of our knowledge, ALL examination topics currently tested are listed in Table 11.910-2 (above). However, we cannot guarantee that individual RECs will not add questions or introduce new topics that we know nothing about. To be on the safe side, ASK the REC if there are any NEW EXAM TOPICS or locally prepared questions on your exam before you enter the exam room.]*

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## "OCEANS" ENDORSEMENTS

**CELESTIAL OBSERVATIONS.** For the "Oceans" endorsement only.

*[Study Guide: Although we sell a number of excellent books on Celestial Navigation, our recommendation to all applicants who must study celestial navigation is to attend a Coast Guard approved course.*

*In choosing your course, be certain that the instructor is familiar with the requirements of the current Coast Guard exam and teaches all of the subtopics listed below. A celestial course designed for yachtsmen or course materials designed for the "old" celestial exams may not fit the bill. **We believe that your instructor should recommend the text and other materials he wants you to use.***

*Our catalog lists a number of text and reference books (including tables) that are currently available. However, for a good introduction and coverage of the subject of Celestial Navigation without having to purchase additional charts, tables, etc., we suggest Norville, W. Celestial Navigation Step-by-Step, MET Stock #BK-203. The book is a complete introductory package and is user friendly. Take the subject as far as you can and then consider going to school if you do not master it.]*

This topic includes the following subtopics:

NAUTICAL ASTRONOMY AND NAVIGATION DEFINITIONS.  
LATITUDE BY POLARIS.  
LATITUDE BY MERIDIAN TRANSIT.  
LATITUDE BY MERIDIAN TRANSIT (sun only).  
FIX OR RUNNING FIX (Sun or any body).  
STAR IDENTIFICATION.  
STAR SELECTION.  
TIME OF MERIDIAN TRANSIT (sun only).  
SECOND ESTIMATE MERIDIAN TRANSIT.  
ZONE TIME SUN RISE/SET/TWILIGHT.  
ZONE TIME MOON RISE/SET.  
ZONE TIME OF SUNRISE, SUNSET & TWILIGHT.  
TIMES OF CELESTIAL PHENOMENA.

**COMPASS.** Includes these subtopics for the "Oceans" endorsements.

- DETERMINATION OF COMPASS ERROR BY AZIMUTH OF THE SUN (only).
- AMPLITUDE (Sun only).
- DEVIATION TABLE CONSTRUCTION.

*[Comment: The compass is covered simply and easily in Chapman's Piloting Seamanship and Small Boat Handling, MET Stock #BK-150. However, the topics Azimuth and Amplitude are covered in Bowditch, MET Stock #PUB9. **Caution:** Unfortunately, the Coast Guard interprets STCW to require these three subtopics for **Near Coastal** as well as Ocean routes.]*

**We Recommend:** Compass Correction at Sea, (CCS) Order MET Stock #BK-005C33.

### OCEANS TRACK PLOTTING

MIDDLE LATITUDE SAILING.  
MERCATOR SAILING.  
GREAT CIRCLE SAILING.  
PARALLEL SAILING.  
ESTIMATED TIME OF ARRIVAL (ETA).

## SEXTANTS NATIONAL ASTRONOMY AND NAVIGATION DEFINITIONS

### SPEED BY RPM

**We recommend:**

- Speed by RPM. (RPM). Order MET Stock #BK-005C50.

### FUEL CONSERVATION

**We recommend:**

- Fuel Conservation. (FC). Order MET Stock #BK-007-C49. Maloney, E.S., Dutton's Navigation and Piloting, 14<sup>th</sup> edition, MET Stock #BK-186 and its workbook Problems and Answers in Navigation and Piloting, MET Stock #BK-186-1. *[Comment: This subtopic is also listed for the "oceans" endorsement. ETA may be based on celestial observations, terrestrial observations, piloting, or electronic navigation.]*

## SEAFARERS TRAINING CERTIFICATION AND WATCHKEEPING CODE

The International Convention on the Standards of Training, Certification, and Watchkeeping, 1978, came into effect on a worldwide basis in 1984 and in the United States in 1991. This international agreement, "STCW-78," was reflected in many licensing changes that took place in the United States between 1987 and 1989 even though we were not a party to the Convention at that time.

Although most credentialed mariners had just become comfortable with these changes, even more sweeping changes were in preparation. Between 1993 and 1995, major portions of STCW-78 were rewritten and strengthened without notice to mariners and become STCW-95.

In July 1995 an amended Seafarers Training, Certification, and Watchkeeping Code (STCW-95) was agreed upon internationally. Since the United States became a party to the original convention in 1991, the new STCW Code became part of the "law of the land."

Starting in 1996, many mariners who renewed their licenses received a new piece of paper (Coast Guard form CG-5601) that is an "Endorsement attesting to the issuance of a certificate under the provisions of the International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers, 1978." There was no cost for this document and usually no explanation of why it was even provided. However, all mariners who sailed beyond the "boundary line" had to carry this paper to validate their license.

This "STCW-78" paper expired on Feb. 1, 2002. After that date, a mariner needed a **STCW-95** endorsement to sail on an international voyage and on vessels greater than 200 tons in U.S. near-coastal waters. This STCW-95 paper required taking a week-long **basic training** STCW course and often one or more other approved courses and proving your proficiency by collecting endorsements in a number of different areas in order to sail on a "seagoing ship" beyond the "boundary line."

### STCW Requirements

Until 1995 American mariners were primarily

concerned with obtaining licenses and, if serving aboard vessels greater than 100 gross tons, in obtaining a Merchant Mariners Document (MMD or "Z-card") to serve in an unlicensed position. The situation changed on July 5, 1995 with the international acceptance of the 1995 "amendments" to the (international) Standards of Training, Certification and Watchkeeping Convention.

The *new* "STCW Code," consisting of 255 pages of international regulations, added a new set of hurdles to individuals who serve on vessels greater than 200 gross tons that either engage in foreign voyages or simply sail beyond the "boundary line" as described in 46 CFR Part 7. The requirements to hold a "STCW-95" certificate are *in addition to* the requirements of earning a credential and officer's endorsement beyond the entry level.

STCW, in most cases, requires attendance at Coast Guard-approved basic training course with 5 days of instruction. This course was neither an "exam-prep" nor a "home-study" course. A listing of all Coast Guard-approved STCW courses and their endorsements is available from the National Maritime Center.

Understanding STCW can be a daunting task. In April 1999, the Coast Guard, for the first time, released a brief description of STCW that was designed to explain STCW to the general public. That description follows:

#### STCW '95 and How It Affects You

*[These are the Coast Guard's words...]*

STCW is an international agreement providing for improved Standards of Training, Certification, and Watchkeeping for seafarers throughout the world and the United States which will:

- Ensure safer seas.
- Safer navigation.
- Reduce seaman deaths and injuries.
- Protect the public in U.S. ports from maritime disasters.
- Conserve our marine environment.
- Improve the competitiveness of the U.S. Maritime Industry.
- Prepare mariners to utilize rapidly changing technology to benefit from the competitive advantages it can provide.
- Reduce the economic advantages of "flags of convenience" employing poorly trained "crews of convenience."

**Basic information:** STCW applies to all present and future mariners who wish to sail **beyond the boundary lines** of the United States. In the U.S. we have exempted mariners from STCW requirements who serve on vessels less than 200 gross tons sailing on domestic voyages.

STCW emphasizes "hands-on" demonstrations of your skill and ability to prove that you are qualified to serve aboard seagoing vessels. Most U.S. mariners have already done this in their careers. The biggest change with STCW is that it formalizes the documentation of your ability to perform these tasks.

Completing a Coast Guard approved training course may be the least complicated way to meet the additional STCW qualification requirements. You may also demonstrate your knowledge and ability for STCW "covered" tasks before a Qualified Assessor. This is an individual qualified to observe your performance and assess your competence.

If you meet the requirements of STCW you will be is-

sued an "STCW 95 Certificate." Your present license or document are separate credentials from this certificate. You may still maintain your license or document without it, however, you will be essentially limited to "inland waters only" employment.

Mariners who began training or service before Aug. 1, 1998 have one-time "gap-closing" requirements to meet before Feb. 1, 2002. Existing mariners may upgrade their license or document (and STCW certificate) before this date under the current regulations; however, the additional requirements still apply if you want the STCW-95 certificate.

Persons beginning training or service employment on or after Aug. 1, 1998 must be part of *an organized training program approved by the Coast Guard* in order to upgrade their STCW certification beyond entry-level qualifications.

#### Existing Mariners

- **All mariners** except those in non-qualified entry-level positions (ordinary seaman, wiper, steward) must show that they are competent in four areas of basic safety. These are 1) basic firefighting, 2) personal survival techniques, 3) elementary first aid, and 4) personal safety and social responsibility. Again, this can be most readily accomplished by attending an approved course, but demonstration of knowledge and ability before a Qualified Assessor may be a future option. This must be done every five years.
- **Engineers** must show knowledge, skill, and ability operating lifeboats. Again, attending an approved course or demonstrating proficiency before a Qualified Assessor accomplishes this. Academy graduates initially examined and qualified as "Lifeboatman" have already met this requirement. This is a one time only requirement.
- **Deck officers** must demonstrate proficiency in Bridge Teamwork Procedures. This can be accomplished by taking an approved course, or if you have served on vessels practicing *Bridge Resource Management*, documenting your ability during that service. This is a one time only requirement.
- **Deck officers** must attend an approved training program and obtain certification as GMDSS Operator to serve on a GMDSS-equipped ship after Feb. 1, 2002. (After Feb. 1, 1999 there must be at least two GMDSS operators aboard every such vessel. Since all vessels greater than 300 gross tons must have GMDSS equipment, the GMDSS training will apply to most deck officers.) This is a one time only requirement.
- **Deck officers** must pass an approved ARPA course for service on ARPA-equipped vessels after Feb. 1, 2002.
- **Officers** must receive training in Advanced Firefighting if they wish to be the "individual designated to control firefighting operations" aboard ship. Persons wishing to serve on tank vessels, RO-ROs, or to operate Fast Rescue Craft must complete additional training programs. Keep documentation for all training you have received together in a "record of training." The Coast Guard Regional Exam Center will use this to verify your eligibility for a STCW 95 Certificate.

### New Mariners

All new mariners who began seagoing service on or after Aug. 1, 1998 must have completed an approved Basic Safety course (or demonstrated ability before a Qualified Assessor) before being certificated as a qualified rating or as an officer. This must be done every five years.<sup>(6)</sup>

All new mariners must be enrolled in, or be a part of, a Coast Guard approved training program in order to be issued a STCW certificate as a qualified rating or as an officer.

Under this program new mariners must demonstrate the ability to perform certain tasks in the presence of a Qualified Assessor. If the task is completed correctly the Qualified Assessor will "sign off" that item in that person's "record of training." Entry-level officers must use a Coast Guard approved Training Record Book (TRB) for this purpose. The Training Record Book must be completed to qualify for a license or STCW certificate.

All existing regulations still apply to obtaining an initial credential. These include minimum age, citizenship, security and medical requirements,<sup>(12)</sup> as well as obtaining a drug test, and recommendations attesting to your character.



### NMC & REC CONTACT INFORMATION

#### USCG National Maritime Center (NMC)

100 Forbes Drive; Martinsburg, WV, 25404  
(304) 433-3400, 1-888-427-5562, Fax: (304) 433-3413,  
or e-mail them at [iasknmc@uscg.mil](mailto:iasknmc@uscg.mil)

#### Regional Exam Centers

*[RECs are in alphabetical order by state including zip code and telephone numbers.]*

- REC Anchorage, AK, 510 L Street, Ste. 100, Anchorage, AK 99501-1946. (907) 271-6733.
- REC Juneau, AK, 2760 Sherwood Lane, Suite 2A, Juneau, AK 99801-5845. (907) 463-2450.
- REC Alameda, CA, Building. 14, Coast Guard Island, Alameda, CA 94501-5100. (510) 437-3092.
- REC Long Beach, CA, 165 N. Pico Avenue, Long Beach, CA 90802-1096. (310) 980-4483.
- REC Miami, FL., Claude Pepper Bldg., 6th Floor, 51 S.W. First Ave., Miami, FL 33130-1608. (305) 536-6548.
- REC Honolulu, HI, 433 Ala Moana Blvd., Room 1, Honolulu, HI 96813-4909. (808) 522-8258.
- REC Mandeville, LA., 4250 Hwy 22 Suite F, Mandeville, LA 70471 Phone: 985-624-5700 Fax: 985-624-5757
- REC Baltimore, MD., U.S. Customhouse, 40 S. Gay St., Baltimore, MD 21202-4022. (410) 962-5132.
- REC Boston, MA., 455 Commercial Street, Boston, MA 02109-1045. (617) 223-3040.
- REC St. Louis, MO., 1222 Spruce Street, Suite 211, St. Louis, MO 63103-2835. (314) 539-2657.
- REC New York, NY., Battery Park Bldg., New York, NY 10004-1466. (212) 668-6395.
- REC Toledo, OH., Federal Bldg., Room 501, 234 Summit Street, Toledo, OH 43604-1590. (419) 259-6394.
- REC Portland, OR., 6767 N. Basin Ave., Portland, OR 97217-3992. (503) 240-9346.
- REC Charleston, SC., 196 Tradd St., Charleston, SC 29401-1899. (803) 724-7693.
- REC Memphis, TN., 200 Jefferson Ave., Suite 1301, Memphis, TN 38103-2300. (901) 544-3297.
- REC Houston, TX., 8876 Gulf Freeway, Suite 210, Houston, TX 77017-6595. (713) 947-0044.
- REC Seattle, WA., 1519 Alaskan Way S., Bldg. 1, Seattle, WA 98134-1192. (206) 217-6115.



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# ESR

## ENGINEER STUDY RECOMMENDATIONS

[Information and recommendations on National & STCW Endorsements for QMED & Limited Engineers]

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### INTRODUCTION

As a result of significant changes mentioned below, this notice cancels previous MET information bulletins and may limit the value of some existing study materials.

In an important Final Rulemaking announced in the Federal Register of Dec. 24, 2013, the Coast Guard again implemented new Amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers known as STCW.

This rulemaking initiated many changes including the establishment of two separate and distinct levels of credential endorsements: 1) **National Endorsements**, and 2) **STCW Endorsements**. While new engineer officers and ratings scurry to fulfill national requirements, many others with these endorsements already in hand must work to earn new STCW endorsements.

According to these regulations, a mariner must first possess an appropriate national endorsement before he or she can obtain an STCW endorsement. Consequently, **many mariners**<sup>(1)</sup> who make international voyages or who sail upon waters **beyond the boundary line**<sup>(2)</sup> will have to **earn**<sup>(3)</sup> STCW endorsements **in addition to** any national endorsements they already may have. The deadline for earning these STCW endorsements is Jan. 1, 2017. At the same time, national endorsements are also changing with a less onerous deadline of Mar. 24, 2019. <sup>(1)</sup>*These changes only affect about 50,000 of an estimated 218,000 currently credentialed mariners.* <sup>(2)</sup>*The "boundary line" is defined in 46 CFR Part 7.* <sup>(3)</sup>*This involves additional study and/or assessment(s) by a Qualified Assessor.*

### TERMINOLOGY

The Coast Guard often makes sweeping changes and advertises every change as an improvement. On April 15, 2009 in an earlier change, the old terms **license** and **Merchant Mariner Document** (MMD or **Z-card**) were replaced by new terms. Mariners must now obtain a Merchant Mariner "**Credential**" (MMC) that looks like a passport booklet and contains many individual **endorsements** that detail their personal qualifications and lists their operational limitations. Mariners now become **Officers** and/or **Ratings** and increasingly are smothered under a new layer of international requirements generated by the International Maritime Organization (IMO), an agency of the United Nations.

Please forgive us if we occasionally slip and use the old terminology!

Endorsements on credentials may sound like double-talk, but every mariner had no choice but to adopt these changes as presented in the Coast Guard's 2009 rulemaking now enshrined in the Code of Federal Regulations.

#### TWIC Cards Came First

In addition, starting on April 15, 2009, the Coast Guard stopped issuing or renewing **any** mariner credential unless he/she first applied for and received a Transportation Workers Identity Credential commonly known as a TWIC card. This is an expensive, state-of-the-art, biometric **identity card**. If the Transportation Security Agency (TSA) denies you a TWIC, you can appeal the decision. However, the Coast Guard will not review the TSA decision and will not process your application until you first satisfy TSA! **Consequently, every credentialed mariner now must deal with two government agencies within the Department of Homeland Security and not just with the Coast Guard as in the past.**

**PUBLIC ACCESS TO COAST GUARD EXAM  
QUESTIONS & ILLUSTRATIONS**

In Sept. 1988, the Coast Guard reluctantly made public all of its exam questions in response to a Freedom of Information Act request followed by a formal appeal by Marine Education Textbooks and the National Association of Maritime Educators. The deck and engine questions, numbering about 22,000, were later published by the U.S. Government Printing Office in a series of "Yellow Books." All these questions were subsequently made available to the public on the Coast Guard's National Maritime Center's website. However, on July 12, 2010 the NMC removed access to all these questions from the Internet. We appealed this decision and 2½ years later succeeded in having the questions restored to the internet.<sup>(1)</sup> Mariners who must prepare for any written Coast Guard professional examination will suffer from the damage resulting from removing public access to these questions for years to come. <sup>[<sup>(1)</sup>We encourage you to access NMA Report #R-428-K, Rev. 7 at [www.nationalmariners.us](http://www.nationalmariners.us) that explains our appeal to restore these questions, answers, and illustrations.]</sup>

In May 2014, the Coast Guard's engineering database as it appeared on the internet contained about 12,700 questions and was organized into 5 "sorts" that provide the basis for exam modules. They are:

- General Subjects
- Motor Plants
- Steam Plants
- Engineering Safety & Environmental Protection
- Electricity, Electronics & Control Engineering

**NATIONAL ENGINEER "RATINGS"  
EXAMINATIONS**

A "Rating" is the "new" terminology for a mariner who is not an "Officer."

For the latest information on requirements for all engineer ratings, go to the Electronic Code of Federal Regulations <http://www.ecfr.gov> and go to 46 CFR Part 12 for the latest

regulations pertaining to Ratings endorsements.

The Coast Guard uses their computers to randomly generate their exams into "modules" of 70 questions each with a passing score of 70%. When your application paperwork is finally complete and you are declared "Approved to Test," the National Maritime Center will tell you the titles of the modules you will be tested on.

QMED is an abbreviation for the ratings of a "Qualified Member of the Engineering Department." The latest Coast Guard regulations contain 5 different "QMED ratings" – a change from the past. They are:

- Oiler.
- Pumpman/Machinist.
- Fireman/Watertender.
- Electrician/Refrigerating Engineer.
- Junior Engineer.

If a mariner obtained **all** of these ratings he/she may obtain a rating of "QMED-All Ratings." Where this was once the top engine rating, there are now **additional requirements** to earn the STCW endorsement of **Able Seafarer – Engine** in 46 CFR §12.607 and §12.609.

If you already have an "engine rating" you should read NVIC 02-14, Grandfathering and Transitional Provisions for Merchant Mariner Credentials. This publication is only available on the internet at:

<http://www.uscg.mil/hq/cg5/nvic/>.

Find the "transitioning" and/or grandfathering provisions at paragraph 5.e. for existing QMED endorsements. Also refer to 46 CFR §12.501 at <http://www.ecfr.gov/>.

Based on the general lack of information available to the public, it is difficult to predict the depth of questioning that will appear on any given exam other than to say that the lower the level of the endorsement, the easier the questions may be – but there is no guarantee.

Look at the list of **test subjects** for "Ratings" exams (especially for the Oiler rating) given in "Table 1 to 46 CFR §12.505(c)". This table will provide some guidance regarding the topics the exam questions will cover. In this case, follow the listed subjects to find out how **one** composite test **module** with 70 questions with a passing grade of 70% is randomly chosen to build an exam from a list of 12,700 questions.

TABLE 1 TO § 12.505(c)—EXAMINATION SUBJECTS FOR QMED RATINGS

Subjects	Pumpman/ machinist	Fireman/ watertender	Oiler	Electrician/ refrigerating engineer	Junior engineer
<b>General subjects:</b>					
Auxiliary machinery .....	X	X	X	X	X
Basic safety procedures .....	X	X	X	X	X
Bearings .....	X	X	X	X	X
Care of equipment and machine parts .....	X	X	X	X	X
Deck machinery .....	X	X	X	X	X
Drawings and tables .....	X	X	X	X	X
Heat exchangers .....	X	X	X	X	X
Hydraulic principles .....	X	X	X	X	X
Instrumentation principles .....	X	X	X	X	X
Lubrication principles .....	X	X	X	X	X
Maintenance procedures .....	X	X	X	X	X
Measuring instruments .....	X	X	X	X	X
Pipes, fittings, and valves .....	X	X	X	X	X
Pollution prevention .....	X	X	X	X	X
Properties of fuel .....	X	X	X	X	X
Pumps, fans, and blowers .....	X	X	X	X	X
Refrigeration principles .....	X	X	X	X	X
Remote control equipment .....	X	X	X	X	X
Use of hand/power tools .....	X	X	X	X	X

Watch duties .....		X	X		X
Electrical subjects:					
A/C circuits .....				X	X
Batteries .....				X	X
Calculations .....				X	X
Communication devices .....				X	X
D/C circuits .....				X	X
Distribution systems .....				X	X
Electronic principles .....				X	X
Generation equipment .....			X	X	X
Maintenance .....			X	X	X
Measuring devices .....				X	X
Motor controllers .....				X	X
Motors .....			X	X	X
Safety .....	X	X	X	X	X
Troubleshooting .....				X	
Safety and environmental protection subjects:					
Communications .....	X	X	X	X	X
Damage control .....	X	X	X	X	X
Elementary first aid .....	X	X	X	X	X
Emergency equipment .....	X	X	X	X	X
Environmental awareness .....	X	X	X	X	X
Fire prevention .....	X	X	X	X	X
Firerighting equipment .....	X	X	X	X	X
Firerighting principles .....	X	X	X	X	X
General safety .....	X	X	X	X	X
Hazardous materials .....	X	X	X	X	X
Shipboard equipment and systems subjects:					
Air conditioning .....				X	X
Ballast .....	X	X	X		X
Bilge .....	X	X	X		X
Compressed air .....	X	X	X	X	X
Desalination .....			X		X
Fuel oil storage/transfer .....		X	X		X
Fuel treatment .....		X	X		X
Heating/ventilation .....	X			X	X
Lubrication .....	X		X	X	X
Portable water .....			X		X
Refrigeration .....			X	X	X
Sanitary/sewage .....			X		X
Steering .....			X	X	X
Steam propulsion subjects:					
Auxiliary turbines .....		X	X		X
Boiler fundamentals .....		X	X		X
Combustion principles .....		X	X		X
Condensate systems .....		X	X		X
Drive systems .....		X	X		X
Feedwater systems .....		X	X		X
Fuel service systems .....		X	X		X
Maintenance .....	X	X	X		X
Safety .....	X	X	X	X	X
Steam fundamentals .....	X	X	X		X
Turbine fundamentals .....		X	X		X
Motor propulsion subjects:					
Air-charge systems .....			X		X
Cooling water systems .....			X		X
Diesel engine principles .....	X		X		X
Drive systems .....	X		X		X
Fuel service systems .....			X		X
Intake/exhaust .....			X		X
Lubrication systems .....	X		X		X
Starting systems .....			X		X
Waste heat/auxiliary boiler .....			X		X

### STCW "ABLE-SEAMAN – ENGINE" (AS-E) RATING ENDORSEMENTS

The Coast Guard prepared NVIC 18-14 to provide guidance on qualification for new endorsements and revalidation of existing endorsements of Able Seafarer-Engine (AS-E). This publication is only available on the internet at <http://www.uscg.mil/hq/cg5/nvic/>. However, if you have a problem obtaining this or any NVIC, call MET ask for a price quotation and we will print and send it to you.

STCW ratings requirements with a deadline of Jan. 1, 2017 appear in these new regulations:

#### 46 CFR §12.607 Requirements to qualify for an STCW endorsement as rating as able seafarer-engine.

(a) To qualify for an STCW endorsement as an able

seafarer-engine, an applicant must ó

- (1) Be not less than 18 years of age;
- (2) Meet the requirements for certification as a ratings forming part of an engineering watch (RFPEW);
- (3) While qualified as an RFPEW, have seagoing service in the engine department of ó
  - (i) Not less than 12 months; or
  - (ii) Not less than 6 months and have completed approved training; and
- (4) Provide evidence of meeting the standard of competence specified in **Table A-III/5 of the STCW Code** (incorporated by reference, see §12.103 of this part).

(b) Until January 1, 2017, seafarers will be considered to have met the requirements of this section if they have served as a watchstanding Qualified Member of the Engine Department (QMED), junior engineer, oiler, fireman/watertender, deck-engine mechanic, or engineman in the engine department, or as an RFPEW for a period of not

less than 12 months within the last 60 months prior to application.

(c) Seafarers holding a rating endorsement as QMED, junior engineer, electrician or electrician/refrigerating engineer, pumpman or pumpman/machinist, refrigerating engineer, or machinist before January 1, 2017, will be eligible for this endorsement upon showing evidence of holding an endorsement as an RFPEW.

(d) The Coast Guard may exempt an applicant from meeting any individual knowledge, understanding, and proficiency required in Section A-III/5 of the STCW Code. These exemptions must be approved by the Coast Guard based upon vessel type. Under these circumstances, the endorsement may include a corresponding limitation.

(e) Except as provided in paragraphs (b) and (c) of this section, seafarers with the following national rating endorsements will be eligible for this endorsement upon completion of requirements designated in this section:

**TABLE 1 TO §12.607(E)—STCW ENDORSEMENT AS ABLE SEAFARER-ENGINE**

Domestic QMED endorsement	Additional sea service for AS-E
Engineman	None.
Deck Engine Mechanic	None.
Electrician	6 months. <sup>1</sup>
Refrigerating Engineer	6 months. <sup>1</sup>
Pumpman	6 months. <sup>1</sup>
Machinist	6 months. <sup>1</sup>

<sup>1</sup>Service may be reduced to 3 months if training has been completed as part of an approved training program

**46 CFR §12.609 Requirements to qualify for an STCW endorsement as rating forming part of an engineering watch (RFPEW).**

(a) To qualify for an STCW endorsement as an RFPEW in a manned engine room or to qualify to be designated to perform duties in a periodically unmanned engine room, an applicant must:

- (1) Be not less than 16 years of age;
- (2) Provide evidence of service as follows:

(i) Six months of seagoing service, which includes training and experience associated with engine room functions, and involves the performance of duties carried out under the supervision of an engineer officer or a qualified STCW rating; or

(ii) Proof of successful completion of a Coast Guard-approved or -accepted training, which includes not less than 2 months approved seagoing service; and

(3) Provide evidence of meeting the standard of competence as specified in Table A-III/4 of the STCW Code (incorporated by reference, see §12.103 of this part).

(b) The Coast Guard may exempt an applicant from meeting any individual knowledge, understanding, and proficiency required in Section A-III/4 of the STCW Code. These exemptions must be approved by the Coast Guard based upon vessel type. Under these circumstances, the endorsement may

include a corresponding limitation.

(c) Seafarers with the following national rating endorsements will be eligible for this endorsement upon completion of requirements designated in this section:

**TABLE 1 TO §12.609(C)—STCW ENDORSEMENT AS RFPEW**

Entry path from national endorsements	Sea service under authority of the endorsement <sup>1</sup>	Competence—STCW Table A-III/4 <sup>2</sup>
Any QMED	None	Y
Wiper	6 months	Y

<sup>1</sup>This column provides the minimum additional service required of the seafarer in order to meet the requirements of this section.

<sup>2</sup>Complete any items in paragraph (a)(3) of this section not previously satisfied.

(d) *Limitations.* (1) STCW RFPEW endorsements issued in accordance with this section will be restricted to specific propulsion modes for steam, motor, or gas turbine-propelled vessels, as appropriate.

(2) STCW RFPEW endorsements issued in accordance with this section for motor or gas turbine-propelled vessels may be endorsed as limited to serve on vessels without auxiliary boilers, waste-heat boilers, or distilling plants. An applicant may qualify for removal of any of these limitations by demonstrating the appropriate competencies.

**NATIONAL LIMITED ENGINEER OFFICER ENDORSEMENTS**

**Regulations**

You must first have your **National** endorsements in order before applying for an International (STCW) endorsement. For the latest information on requirements for all engineer officers, go to the Electronic Code of Federal Regulations, <http://www.ecfr.gov/>, and go to 46 CFR Part 11 to view the latest regulations pertaining to Officer endorsements.

**Paperwork Required**

As a candidate for an endorsement you must complete a USCG **credential application form** by contacting your nearest Regional Exam Center (REC). Follow all their instructions. We won't confuse you because these requirements change faster than our editorial staff can keep up with them!

**Engineer Officer Exams**

Each Officer exam consists of *up to five (5) separate modules* of 70 questions each with a passing grade of 70%. Each module must be completed in morning and afternoon sessions over one or more days. As you advance from Rating to Officer, the level of difficulty of the questions you face increases. If you advance into areas where STCW endorsements are required, be aware that there are two different levels of officer endorsements 1) the Operational Level, and, 2) the Management level with additional requirements. In addition, you will find all engineering personnel must be proficient in the use of the types of survival craft found on their vessel and participate in required drills to demonstrate their proficiency.

TABLE 1 TO §11.950  
 CODES FOR ENGINEER OFFICER ENDORSEMENTS

1. First assistant engineer (unlimited).
2. Third assistant engineer (unlimited).
3. Chief engineer (limited).
4. Assistant engineer (limited).
5. Designated duty engineer (unlimited).
6. Designated duty engineer (4,000 HP).
7. Designated duty engineer (1,000 HP).

8. Chief engineer (uninspected fishing industry vessels).
9. Assistant engineer (uninspected fishing industry vessels).
10. Chief engineer (MODU).
11. Assistant engineer (MODU).
12. Chief engineer (OSV unlimited).
13. Assistant engineer (OSV unlimited).
14. Chief engineer (OSV 4,000 HP).
15. Assistant engineer (OSV 4,000 HP).

Reproduced from 78 FR 77962-77973, Dec. 24, 2013 [S=Steam Propulsion; M=Motor Propulsion; G=Gas Turbine Propulsion.]

Table 2 to § 11.950 -- Subjects for engineer officer endorsements

	1			2			3			4			5			6			
	S	M	G	S	M	G	S	M	G	S	M	G	S	M	G	S	M	G	
General Subjects:																			
Prints and tables	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hand tools				X	X	X				X	X	X	X	X	X	X	X	X	X
Pipes, fittings, and valves				X	X	X				X	X	X	X	X	X	X	X	X	X
Hydraulics	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Materials science				X	X	X				X	X	X							
Bilge systems	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X
Oily water separators	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sanitary/sewage systems	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Freshwater systems	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lubricants				X	X	X				X	X	X	X	X	X	X	X	X	X
Lubrication systems	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X
Automation systems	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X
Control systems	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Propellers/shafting systems	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X
Machine shop				X	X	X				X	X	X	X	X	X	X	X	X	X
Distilling systems	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X
Pumps				X	X	X				X	X	X	X	X	X	X	X	X	X
Compressors				X	X	X				X	X	X	X	X	X	X	X	X	X
Administration	X	X	X				X	X	X										
Bearings	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Governors	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cooling systems	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X
Instruments				X	X	X				X	X	X	X	X	X	X	X	X	X
Ship construction and repair				X	X	X				X	X	X	X	X	X	X	X	X	X
Steering systems	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

	1			2			3			4			5			6		
	S	M	G	S	M	G	S	M	G	S	M	G	S	M	G	S	M	G
Deck machinery	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ventilation systems	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Thermodynamics				X	X	X				X	X	X						
Heat exchangers				X	X	X				X	X	X				X	X	X
Watch duties				X	X	X				X	X	X						
International rules and regulations				X	X	X				X	X	X						
Refrigeration and air conditioning:																		
Theory				X	X	X				X	X	X				X	X	X
Air conditioning systems	X	X	X	X	X	X				X	X	X				X	X	X
Refrigeration systems	X	X	X	X	X	X				X	X	X				X	X	X
Control systems	X	X	X	X	X	X				X	X	X				X	X	X
Instruments-gauges				X	X	X				X	X	X				X	X	X
Safety	X	X	X	X	X	X				X	X	X				X	X	X
Casualty control	X	X	X	X	X	X				X	X	X				X	X	X
Electricity, electronics and control systems:																		
Theory				X	X	X				X	X	X				X	X	X
General maintenance				X	X	X				X	X	X				X	X	X
Generators				X	X	X				X	X	X				X	X	X
Motors				X	X	X				X	X	X				X	X	X
Motor controllers	X	X	X	X	X	X				X	X	X				X	X	X
Propulsion systems	X	X	X	X	X	X				X	X	X				X	X	X
Distribution systems	X	X	X	X	X	X				X	X	X				X	X	X
Electronic systems	X	X	X	X	X	X				X	X	X				X	X	X
Batteries				X	X	X				X	X	X				X	X	X
Communications				X	X	X				X	X	X				X	X	X
Safety	X	X	X	X	X	X				X	X	X				X	X	X
Casualty control	X	X	X	X	X	X				X	X	X				X	X	X
Troubleshooting	X	X	X	X	X	X				X	X	X				X	X	X

	1			2			3			4			5			6		
	S	M	G	S	M	G	S	M	G	S	M	G	S	M	G	S	M	G
High voltage systems	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Computers and networks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bridge navigation equipment	X	X	X				X											
Steam Generators:																		
Steam-theory				X	X		X	X		X	X		X	X		X	X	
Main boilers	X			X	X	X			X	X		X	X		X	X		X
Auxiliary boilers	X	X	X	X	X	X			X	X		X	X		X	X		X
Feedwater systems	X	X	X	X	X	X			X	X		X	X		X	X		X
Condensate systems	X	X	X	X	X	X			X	X		X	X		X	X		X
Recovery systems	X	X	X	X	X	X			X	X		X	X		X	X		X
Fuel	X			X	X		X					X				X		
Main fuel systems	X			X	X		X					X				X		
Boiler water chemistry	X			X	X		X					X				X		
Control systems	X			X	X		X					X				X		
Automation systems	X			X	X		X					X				X		
Safety	X			X	X		X					X				X		
Casualty control	X			X	X		X					X				X		
Steam engines:																		
Main turbines	X			X	X		X					X				X		
Auxiliary turbines	X	X		X	X		X					X				X		
Governor systems	X			X	X		X					X				X		
Control systems	X			X	X		X					X				X		
Automation systems	X			X	X		X					X				X		
Lubrication systems	X			X	X		X					X				X		
Drive systems	X			X	X		X					X				X		
Auxiliary diesels	X			X	X		X					X				X		
Safety	X			X	X		X					X				X		
Casualty control	X			X	X		X					X				X		
Motor propulsion:																		
Fundamentals					X													X

	1		2		3		4		5		6	
	S	M	G	S	M	G	S	M	G	S	M	G
Main engines		X		X			X	X		X	X	
Auxiliary engines		X		X				X		X	X	
Starting systems		X		X				X		X	X	
Lubrication systems		X		X				X		X	X	
Fuel		X		X				X		X	X	
Fuel systems		X		X				X		X	X	
Fuel injection systems		X		X				X		X	X	
Intake systems				X				X		X	X	
Exhaust systems				X				X		X	X	
Cooling systems				X				X		X	X	
Air-charging systems		X		X				X		X	X	
Drive systems				X				X		X	X	
Control systems		X		X				X		X	X	
Automation systems		X		X				X		X	X	
Governors		X		X				X		X	X	
Steam systems		X		X				X		X	X	
Water chemistry		X		X				X		X	X	
Safety		X		X				X		X	X	
Casualty control		X		X				X		X	X	
Safety:												
Fire theory	X	X	X	X	X	X	X	X	X	X	X	X
Fire prevention	X	X	X	X	X	X	X	X	X	X	X	X
Fire fighting	X	X	X	X	X	X	X	X	X	X	X	X
Flooding	X	X	X	X	X	X	X	X	X	X	X	X
Dewatering	X	X	X	X	X	X	X	X	X	X	X	X
Stability and trim	X	X	X	X	X	X	X	X	X	X	X	X
Damage control	X	X	X	X	X	X	X	X	X	X	X	X
Emergency equipment and lifesaving appliances.												
General safety	X	X	X	X	X	X	X	X	X	X	X	X
Hazardous materials	X	X	X	X	X	X	X	X	X	X	X	X

	1			2			3			4			5			6		
	S	M	G	S	M	G	S	M	G	S	M	G	S	M	G	S	M	G
Pollution prevention	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inspections and surveys	X	X	X				X	X	X				X	X	X	X	X	X
U.S. rules and regulations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Gas Turbines																		
Configurations						X						X						X
Fundamentals						X						X						X
Thermo-dynamics			X			X						X						X
Construction						X						X						X
Operating parameters			X															X
Start systems						X						X						X
Lubrication systems			X			X						X						X
Fuel systems			X			X						X						X
Drive systems			X			X						X						X
Bleed air systems						X						X						X
Intake and exhaust systems						X						X						X
Instrumentation and controls			X			X						X						X
Maintenance			X			X						X						X
Inspection			X			X						X						X
Troubleshooting			X			X						X						X
Casualty control			X			X						X						X
Management level																		
Management skills	X	X	X				X	X	X									
Crisis management	X	X	X				X	X	X									
Shipyard	X	X	X				X	X	X									
Inspections-surveys	X	X	X				X	X	X									
Vessel layout	X	X	X				X	X	X									
Employee familiarization	X	X	X				X	X	X									
Operational planning	X	X	X				X	X	X									

	1			2			3			4			5			6		
	S	M	G	S	M	G	S	M	G	S	M	G	S	M	G	S	M	G
Assessing competency	X	X	X				X	X	X									
Management practices	X	X	X				X	X	X									
Arbitration	X	X	X				X	X	X									
Internal documents	X	X	X				X	X	X									
International laws-conventions	X	X	X				X	X	X									
Technical analysis	X	X	X				X	X	X									
Maintenance systems	X	X	X				X	X	X									
Troubleshooting	X	X	X				X	X	X									
Codes and regulations	X	X	X				X	X	X									

Note: Numbers on the top row of this table represent endorsement titles found in table 1 to 11.950

S - Steam propulsion

M - Motor propulsion

G - Gas turbine propulsion

## STCW (INTERNATIONAL) LIMITED ENGINEER OFFICER ENDORSEMENTS

Because this rulemaking is so complex the Coast Guard prepared a series of Navigation and Vessel Inspection Circulars to provide guidance on qualification for new and revalidation of existing endorsements. To obtain any of these publications on the internet go to <http://www.uscg.mil/hq/cg5/nvic/>. These documents are available (free) on the internet. However, if you do not have internet access or have a related problem with obtaining this or other documents, call MET ask for a price quotation and we will print and/or provide it for you.

- **NVIC 17-14.** Guidance on Qualification for STCW Endorsement as Officer in Charge of an Engineering Watch in a Manned Engineeroom or Designated Duty Engineer in a Periodically Unmanned Engineeroom on Vessels Powered by Main Propulsion Machinery of 750 KW/1000 Hp. Propulsion Power or More (Operational Level).
- **NVIC 16-14.** Guidelines for Qualification for STCW Endorsements as Chief Engineer Officer and Second Engineer Officer on Ships Powered by Main Propulsion Machinery of 750 kW/1,000 Hp. or More and less than 3,000 kW/4,000 Hp. Propulsion Power (Management Level)
- **NVIC 15-14.** Guidelines on Qualification for STCW Endorsements as Chief Engineer Officer and Second Engineer officer on Ships powered by Main Propulsion Machinery of 3,000 kW/4,000 Hp. Propulsion Power or more (Management Level)
- **NVIC 19-14.** Coast Guard Policy on Qualified Assessors.

## THE IMPORTANT DIFFERENCE BETWEEN EXAM "TOPICS" AND "MODULES"

Coast Guard Regional Exam Centers (REC) still provide and proctor exams prepared by the National Maritime Center. In dealing with an REC or the NMC you should understand the difference between exam topics and modules.

### Exam "Topics"

The topics that each exam must cover are listed in the left hand column in Table 2 to §11.950 (above). The regulations require testing on each topic shown by an "X" in the numbered column you select (S,M, or G).

In some cases the "X" is replaced by a number within the columns whose meaning is explained in the Footnotes at the end of the table. Consequently, you must prepare to answer questions dealing with many exam topics marked either by an "X" or by a number. In providing and recommending training materials, we try to cover each of the many "topics" as thoroughly as possible to the limit required by limited Engineer officers.

### Exam "Modules"

The Coast Guard administers your exam in one or more sections called "modules." Each module may contain *one or more topics arranged for the convenience of the Coast*

*Guard in administering the exam.* These modules are given *generic names* like:

- Engineering General Subjects [G]
- Electricity, Electronics and Control Engineering [E]
- Engineering Safety and Environmental Protection [X]
- Motor Plants [M], and
- Steam Plants [S] – terms that appear deceptively simple.

**Remember that most "modules" contain a collection of different topics** and thousands of questions. They are not as simple as their generic description might lead you to believe. Consequently, in describing any given exam to a mariner, Coast Guard employees speak in terms of modules. It is easier for them to describe any exam in these terms because that is how they must administer the test in accordance with their complex instructions in the Engineering Guide that says nary a word about a "topic."

### Preparing for Your Exam

When you prepare for an exam, be sure that you prepare for each "topic" listed in the "Exam Topics" in the left hand column in Table 2 to §11.950. When an "X" appears in the numbered column for the exam you plan to take, it means that you must prepare to answer questions or work problems on the "topic" listed on the left-hand side of the page. The reason for dividing one numbered column into 3 parts is that you will be tested on either (S) Steam, (M) for Motor Plants (i.e., diesel engines) or (G) for gas turbine propulsion plants. Be sure to highlight the correct column(s). If a number appears in a column instead of an "X", consult the footnotes at the end of the table to see if the numbered footnote applies to you since.

If you are upgrading (i.e., adding endorsements to) your credential from one level to another, be sure to have your Evaluator at the NMC inform you about the "modules" you must prepare for. This information also is available in the Coast Guard's Engineering Guide you *could* view on the National Maritime Center's website that identifies each module in the exam you will be taking. However, you may find this information confusing because it was prepared primarily for Coast Guard employees. If you are told you will be tested on a particular "module" the identifying letters [G], [E], [X], [M] or [S] will identify Coast Guard questions in our textbook from those exam modules. However, our concern is to present the subject matter (i.e., topics) and not be overly concerned with which module any given question belongs in.

### Not All "Topics" Are Treated Equally on an Exam

You may find that some subjects are covered in much greater depth or detail than others. There are more questions on some topics than on others within any given test module. Modules will vary from exam to exam and from time to time since the Coast Guard constantly generates new exams and pulls and refines questions from their data bank at random. However, in our chapters, we treated each topic as comprehensively as possible.

There are a variety of approaches to prepare for a Coast Guard exam. Most of these approaches can work when presented by qualified instructors.

Some schools offer "Coast Guard Approved" courses that grant course-completion certificates the Coast Guard recognizes in lieu of Coast Guard exams. The National Maritime Center (NMC) in Martinsburg, West Virginia, maintains an updated list of Coast Guard-approved courses.

You can contact them by phone at (304) 433-3400, by FAX at (304) 433-3413 or by email through the internet at [iasknmc@uscg.mil](mailto:iasknmc@uscg.mil). Only you can decide which steps to take, how hard to study, and how much your budget will allow. Prepare as much as you can to assure your best progress in school, on the exam, and on the job.

Although MET does not operate a "school," we believe that exam preparation is an essential part of today's credentialing picture. We work hard to prepare our materials to reflect the latest information to guide both students and their instructors.

Expect only limited guidance from your local REC. In fact, the only Coast Guard **subject matter specialists** in the system are at the National Maritime Center in Martinsburg, West Virginia. This is why very few examiners at the Regional Exam Centers would be able to answer specific exam questions even if they were allowed to do so. However, you should expect the REC to obtain the appropriate examination from the NMC and grade it properly using the correct answer key.

**STUDYING WITH OUR TEXTBOOKS**

Here are a few points that explain our textbooks.

- We analyzed the published questions and separated them on a subject-by-subject basis. In this process, to save your time, we removed all duplicate questions and identified any other "similar" (i.e., almost duplicate) questions so you won't stumble over them. With "similar" questions, your chance of finding that question on your exam doubles.
- Within each grouping of questions we start with questions that (in our opinion) are "easier" and move forward to those that are more difficult.
- Absorbing the latest Coast Guard questions withheld from the public for over 2½ years will take time. Changes already applied to the books will appear in the "List of Changes" posted in new textbooks. Lists of changes are available to our readers free of charge. Revised pages are available on a "per page" basis. Call us to discuss!
- We identify "genuine" Coast Guard questions by their unique number that appears **directly above** the question number. The letter that precedes a five-digit number refers to the **module** in which the question appears. The five digits reflect the Coast Guard's question number. Please refer to that number in any correspondence regarding a particular question. In this book the abbreviation "G" refers to questions taken from **General Subjects** database questions; "X" refers to questions taken from **Engineering Safety** database questions; "M" refers to **Motor Plants**, "E" refers to **Electrical** questions, and "S" refers to **Steam Plants**. Most "limited tonnage" mariners do not have access to steam powered equipment. Examples of subject areas within the different modules appears in Table 1 to 46 CFR §12.505(c)
- You may feel that a given question is "too advanced" to apply to the endorsement you seek. However, consider the largest size or horsepower vessel the endorsement will cover, rather than the size of vessels you served on in the past.

Passing a Coast Guard multiple choice exam only means one thing **that you can pass a Coast Guard multiple-choice exam!** You may be fully competent to perform the duties to safely operate the machinery and

equipment on vessel you work on, but the **national endorsement** you receive from the Coast Guard indicates that you have sufficient education, training, reading comprehension and vessel experience to be able to quickly **adapt and learn** to safely operate the engineering equipment on board **any other vessel** within the limitations of your endorsement. If you can read and understand what the Coast Guard exam question seeks to determine, then you can master instructions, manuals, catalogues, the CFR and other information sources that enable you to transfer to other vessels with different equipment and machinery and operate it safely and efficiently. However, an **STCW endorsement** is different in that it may require you to **demonstrate** your skills to a **Qualified Assessor** aboard ship or in a simulator.

**WORKBOAT ENGINEER & OILER, REVISED EDITION E**

Our Workboat Engineer & Oiler series provides much more than Coast Guard questions and answers. It is a complete course from an Oiler rating to a Limited Engineer Officer endorsement. These volumes were developed to prepare engineer officers and ratings on diesel powered vessels like Tugboats, Towboats, Offshore Supply Vessels, Small Passenger Vessels, and small cargo vessels of limited horsepower and tonnage to pass professional examinations for Coast Guard endorsements and to serve as competent, well-informed merchant mariners. The limited horsepower might be anywhere from 100 to 10,000 hp while the limited tonnage might range from less than 100 to as much as 6,000 tons. Each book is available individually as are all chapters on an individual basis by special order. The Table of Contents details the coverage.

**BOOK 1**

Chapter 1 Workboat Engineer Training, Licensing, and Manning ..... WE  
 Chapter 2 Useful Information for Licensed and Unlicensed Workboat Engineers ..... U  
 Chapter 3 Basic Principles of Watchkeeping ..... WAT  
 Chapter 4 Operational and Safety Information for Engineers ..... OSIE  
 Chapter 5 Tank Safety ..... TSE

**BOOK 2**

Chapter 6 Pollution Control for Engineers ..... PCE  
 Chapter 7 Rules and Regulations for Offshore Supply Vessels ..... OSV  
 Chapter 8 Fires, Firefighting, and Fire Prevention for Engineers ..... FFE  
 Chapter 9 Practical Stability ..... STABE  
 Chapter 10 Temporary Repairs ..... TRE  
 Chapter 11 First Aid ..... FAE

**BOOK 3**

Chapter 12 Care and Use of Common Hand Tools ..... HT  
 Chapter 13 Fundamentals of Diesel Engines ..... DE  
 Chapter 14 Diesel Engines: Questions and Answers ..... DEQ  
 Chapter 15 Auxiliary Machinery ..... AUX

**BOOK 4**

Chapter 16 Electricity, Electronics and Control

Engineering.....	E
Chapter 17 Electrical Questions and Answers.....	EQ
Chapter 18 Refrigeration and Air Conditioning.....	REF

### BOOK 5

Chapter 19 Lifeboatman.....	LBE-1
Chapter 20 Survival at Sea .....	SAS-1
Chapter 21 Emergency Procedures .....	EMER-1

### Merchant Marine Engineering Examination Illustration Book (MET Stock #BK-679)

The Coast Guard now generates the illustrations it requires to accompany the exam you will receive. In addition, they post most current illustrations on the internet. While most schools have copies of *an* illustration book, if you study at home using our books, you will need to refer to both the 1) old illustrations, and 2) the New USCG illustrations. Both are contained in our BK-679 which we modified to fit Workboat Engineer & Oiler, Revised Edition E. Since this illustration book is a book in transition, please contact us for further information.

<b>M.E.T. EXAM STUDY BOOKS FOR SPECIFIC RATINGS</b>
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#### RATING: QMED OILER

*[MET's QMED-Oiler Book, Stock #BK-0068]*

This book will help you prepare specifically for the Coast Guard's "QMED- Oiler" exam. Although this book contains actual Coast Guard questions and answers that appeared in exam modules, you should study the concepts contained in each section rather than attempt to memorize the answers to individual questions. Since many questions in the database cover the same concept, do not be surprised if your exam contains questions worded differently from those you studied.

The Coast Guard has several different versions of each exam module and they constantly prepare new versions and write new questions. However, the concepts behind the questions they ask remain unchanged!

We made every attempt to cover all the *concepts* appropriate to your exam level. *However, we make no claim, expressed or implied, that this book contains all of the questions that you may see on your exam.*

We arranged this book with a concise discussion of concepts of subject matter followed by questions and answers that are based on those concepts. Remember **study the concepts**. Then use the questions and answers to check your understanding of the concepts, and learn the various ways the Coast Guard may cover these concepts.

Many people believe some exam questions are "tricky," so it falls on you to learn the various types of tricks. "Tricks" often include *grammar and usage* (i.e., the way they write the question) or language (i.e., using a "fancy" word, such as "illustration," instead of a more common word, such as "picture" or drawing).

Although we use the words "he," "him," and "his" sparingly to enhance communication, they are not intended to be gender driven nor to affront or discriminate against any female merchant mariner studying this book.

The Oiler rating is the most common QMED rating. The need for the Oiler rating is found on both steam and diesel-powered deep-sea vessels that are traditionally manned. The Oiler rating is required aboard diesel vessels, whereas the

Fireman/Watertender is not. Therefore, a person holding an **"unlimited"** Oiler endorsement must be competent to serve aboard **both steam and diesel powered vessels**.

This book, first in a series, was designed to help you prepare for all engineering ratings, including **Oiler** (Steam and Motor/ Diesel) or **Oiler, Motor Vessels, Limited**. It provides a useful background for a number of **Limited Tonnage Engineer Officer** endorsements.

**Sections 1 through 28** cover basic subject areas that are common to both diesel and steam vessels such as engineering safety, tools, piping systems, bearings, lubrication, steering gear, hydraulics, refrigeration, etc. The questions used to illustrate the concepts presented come from four different Coast Guard question database "sorts" 1) Engineering Safety, 2) General, 3) Motor Plants and 4) Steam Plants as reflected in Coast Guard-numbered questions with the letters S, G, M and V respectively.

Generally speaking, the questions deal with concepts that apply to both diesel and steam vessels, although an individual question may seem to be directed at only one type of power plant by the way it is worded.

Most questions in sections 1 through 28 are S (Engineering Safety) or G (General Subjects) questions, but M (Motor Plants - Diesel) and V (Steam) questions are included if they apply to both type of vessels.

**Sections 29 through 38** cover **Oiler – Motor Plants** (M) contain the subject matter for the Oiler working aboard **diesel powered vessels**.

**Sections 39 through 45** cover **Oiler - Steam Plants** (V). Persons seeking an endorsement for steam plants must study these sections.

**If you seek a steam rating**, Section 31 covers an introduction to boiler operations. The material covered here is basically boiler construction and nomenclature (i.e., names of parts) and those operations an Oiler is routinely involved in such as soot-blowing, or operations that will cause a change in his "readings." Detailed and in-depth boiler operations subject matter more properly belongs in the realm of the **Fireman/Watertender** and is covered in our Boiler book.

**We urge you to study the concepts, not the specific questions!** The questions you see on your exam may be worded differently than the questions in this book. However, if you understand the concepts and have adequate reading comprehension you can handle the Coast Guard word games that any slight wording changes present.

#### RATING: QMED FIREMAN/WATER TENDER

*[MET's QMED "Boilers" Book, Stock #BK-0068-2]*

This book goes beyond the Introduction to Boilers in Section 39 of the Oiler book. The Boiler book goes into more depth about the equipment, maintenance and operations in the boiler room on steam-powered vessels. We prepared the boiler book for the **Fireman/Watertender** ratings found only on steam powered vessels. You should study the Boiler book along with the QMED-Oiler book if you work on steam vessels.

#### NEW COMBINED RATING ELECTRICIAN/REFRIGERATING ENGINEER

*[MET Stock #BK-0068-3]*

This book deals with electricity in its entirety. Its coverage of electricity arguably is deeper than the limited tonnage engineering officer endorsements.

An **Electrician** must have a broad knowledge of all

marine equipment that electricity either powers or controls. Electrician candidates also must study the QMED-Oiler book since many of these concepts will also be on the Electrician rating exam.

The **Refrigerating Engineer** used to stand watches on refrigerated cargo ships such as banana boats that required precise temperatures maintained within 1 to 3 degrees and to stand watch and adjust, control, and repair units on container ships. He is a specialist in refrigeration and climate control (i.e., HVAC and air conditioning). A Refrigeration Engineer must also study the QMED-Oiler book since many of these concepts will also be on the Refrigeration Engineer rating exam.

### **NEW COMBINED RATING: PUMPMAN/MACHINIST**

*[MET's "Advanced Machine Shop" Book, Stock #BK-0068-4]*

The recently combined **Pumpman/Machinist** rating is seldom required by the vessel's Coast Guard Certificate of Inspection (COI) on limited tonnage vessels. However, some vessels carry Machinists who primarily perform day work (from 8 AM to 5 PM) involving general maintenance and repairs including work on lathes, milling machines, and other specialized equipment including cutting, welding, brazing, and other shop functions.

The Machinist rating requires a detailed knowledge of measuring instruments such as micrometers and Vernier calipers, etc. Reading and calibrating these instruments and transferring dimensions to advanced machine shop equipment that may be installed on the vessel is included in this rating. Machinist candidates also must study the QMED-Oiler book since many of these concepts will also be on the Machinist rating exam.

The Pumpman previously was a separate rating who was used to perform tankerman-type duties on Tank Vessels of all sizes.

### **RATING: JUNIOR ENGINEER**

Reviewing the Subjects listed in Table 1 to §12.505( c) (above) we suggest studying all the foregoing material for the preceding ratings.

## **ADDITIONAL ENGINEERING STUDY MATERIALS**

**DIESEL TECHNOLOGY.** Norman, A; Corinchock, J; Scharff, R. 2001. 672p. App. Intro. Gloss. Index. Fully illus. ISBN 1-56637-733-1. MET Stock #BK-0860.

This book is designed to provide students in the rapidly changing diesel engine field with up-to-date information on the construction, operation, service, and repair of diesel engines that are used to power ships, generators, pumps, compressors, trucks and construction equipment. It also contains information on the latest developments in the diesel engine field including control computers; fuel management and emissions control systems. Today's diesel technicians must understand how these components and systems operate to service them properly. It is both an ideal text for the beginning diesel student and a valuable resource for diesel technicians currently working in the field of servicing and repairing diesel engines.

Chapters include: Introduction to Diesel Engines; Shop Safety; Tools, Precision Tools and Fasteners; Principles of Operation; Engine Blocks; Crankshafts: Pistons, Rings and Connecting Rods; Cylinder Heads and Related Components;

Camshaft and Valve Train Components; Lubrication Systems; Cooling Systems; Air Intake Systems; Exhaust Systems; Diesel Fuels; Basic Fuel Systems; Fuel Filters and Conditioners; Injection System Fundamentals; Injection Nozzles; Governors and Acceleration Controls; Multiple Plunger Inline Injection Pumps; Distributor Injection Pumps; Unit Injector Fuel Injection Systems; Cummins Pressure-Time Injection Systems; Basics of Electricity; Electronic Engine Controls and Fuel Injection; Diesel Engine Charging Systems; Diesel Starting Systems; Engine Reassembly and Installation; Preventive Maintenance and Troubleshooting; Career Opportunities.

**DIESEL ENGINES** by Naval Education and Training Command (NAVEDTRA 10625) MET Reprint, 1976, 281 pgs., illustrations. Index. MET Stock# BK-408.

This text is intended to serve as a reference for personnel actually working on, or supervising work on, diesel engines and also to support a course of non-resident study for those who anticipate duties associated with diesel engines.

For the benefit of personnel who have gained practical experience in diesel engine operation and maintenance, this text offers a general coverage of theory, design, and thermodynamics of diesel engines. For those who have gained an academic grounding in diesel engineering, the text describes specific design, maintenance, and operating procedures related to the most commonly used diesel engines.

Contents Include: Introduction, Basic Principles, Reciprocating Internal-Combustion Engines, Principal Stationary Parts, Principal Moving and Related Parts, Operating Mechanisms for Engine Parts, Fuel Systems and Engine Control, Air Intake and Exhaust Systems, Lubricating Oil Systems, Cooling Systems, Starting Systems, Transmission of Engine Power, Diesel Engine Operating Procedures, Troubleshooting, Index.

**PRACTICAL MARINE ENGINEERING** by Reno C. King, Jr., 2<sup>nd</sup> ed. 524p. plus index. ISBN 0-924114-60-9. MET Stock #BK-448. *[Note: For steam engines and steam plants.]*

MET reprinted a limited number of copies of this classic marine engineering textbook, last printed in 1969, for which many people in the marine industry expressed an interest. The main topics covered by this book include: Introduction to the Marine Power Plant; Boiler Construction-General Requirements; Construction of Scotch Boilers; Water-Tube Boilers; Combustion; Boiler Operation and Maintenance; Boiler-Water Problems; Reciprocating Steam Engines; Steam Turbines; Electricity; Refrigeration; Pumps and Unfired Pressure Vessels; Miscellaneous Equipment; Respiratory Apparatus; Firefighting Equipment, Rules and Regulations; Engineering Mathematics. The book is simply written, profusely illustrated and well edited, and although somewhat dated, remains a valuable and outstanding text.

*[Study Guide: These numbered "sections" in Mr. King's book are ones that deserve special attention: SECTIONS #10, 14, 19 thru 22, 24 thru 27, 29 thru 31, 46 thru 51, 56 thru 73, 77,97 thru 111, 115 thru 127, 133 thru 140, 143 thru 145, 163 thru 169, and 173.]*

**MODERN MARINE ENGINEER'S MANUAL, VOLUME 1.** by Hunt, Everett C. (Editor). 3rd ed., 1999. 1,296p. Photographs. Figures. Tables. Index. ISBN 0-87033-496-4. MET Stock #BK-344.

**MODERN MARINE ENGINEER'S MANUAL VOL. II.** Hunt, Everett C. et al. 3rd ed. 2002, 976p. Photos. Figs. Tables. Index. Glossary, Review Questions. ISBN 0870335375. MET Stock #BK-345.

Steam turbine propulsion systems are included but the coverage is reduced in recognition of the popularity of main propulsion diesel engines, covered in Volume II, and the anticipated increasing applications of aero-derivative gas turbines that are covered in detail. Pumps, pumping systems, and heat ex-changers are given extensive coverage. Computer applications for machinery and system management are presented, including planning the system, system hardware, system applications, database development, and data communications. The relevant material on international and national laws, regulatory rules, and standards such as ISO 9000 and the ISM code is included in the text. The characteristics of fuels, fuel chemical treatment, fuel mechanical processing, and the avoidance of combustion chamber deterioration are presented. A chapter on safety and management discusses shipboard engineering operations, shipyard repair planning and economics, safety management, and safety organization. Each chapter includes review questions and references for additional study. Metric measurements and customary USA units are interchanged throughout the text to assure familiarity with both systems.

**BOILER TECHNICIAN – 3RD AND 2ND.** by U.S. Navy. 1991. MET Stock #BK-720.

This book serves as an aid to performing duties in these areas: administration and management; steam engineering; the engineering plant; boiler fittings and instruments; automatic boiler controls; propulsion boiler operation; boiler water/feedwater test and treatment; auxiliary machinery; valves, pipe fittings, and piping.

**Internet Study Material Available for Reference Electrician's Mate.** U.S. Navy NAVEDTRA 14344. This material was prepared with your tax dollars and is available on the internet. Quote: "This is a *self-study course*. By studying this course, you can improve your professional/military knowledge as well as prepare for the Navy-wide advancement in rate examinations. It contains subject matter about day to day occupational knowledge and skill requirements and includes text, tables, and illustrations to help you understand the information. An additional important feature of this course is its reference to useful information in other publications. The well-prepared sailor will take the time to look up the additional information.ö

**Advantages:** The government trains its mariners with your tax dollars. This is a well written, government publication approved for public release. This publication should be available free on the internet. You may find much of this information useful in your electrical studies. Here is a listing of all the chapters. 1. Rating Information, General Safety Practices, and Administration; 2. Electrical Installations; 3. AC Power Distribution Systems; 4. Shipboard Lighting; 5. Electrical Auxiliaries; 6. Motor Controllers; 7. Maintenance and Repair of Rotating Electrical Machinery; 8. Voltage and Frequency Regulation; 9. Electrohydraulic Load-Sensing Speed Governors; 10. Degaussing; 11. Cathodic Protection; 12. Visual Landing Aids; 13. Engineering Plant Operations, Maintenance, and Inspections; 14. Engineering Casualty Control; **Appendix:**

Glossary; References; Electrical Symbols. **Disadvantage:** Since the Merchant Marine is not the U.S. Navy you can pick and choose the material you may need.

**Siemen's Technical Education Program. Basics of Electricity.** Available free on the internet. This is excellent material prepared by one of the world's largest electrical manufacturers to train its employees and customers. It is well written, well illustrated, and user friendly. It is available free on the internet. They *also* have training material on these electrical topics: **Basics of Electrical Products. Basics of A.C. Motors. Basics of Circuit Breakers**

#### Electrical Reference Books

*[Study Guide: Although we cite the following books that we used for reference in the Electrical Chapters in Workboat Engineer & Oiler, there are many other basic books on electricity available in public libraries that you may find equally useful whenever you encounter an area where you need additional assistance – and you will find these areas. We divided the electrical questions into many topics and sub-topics to help you locate further explanations whenever you need them. As you move forward, you may find **tutorials** available on the internet through search engines such as Google that are extremely useful. Even a picture or a video may be worth its weight in gold. Tutorials on the internet are a gift. Use them wisely.]*

Gillis, Alan. **Electrical, The Unofficial Study Guide to the New USCG Marine Engineering Electrical Exam.** Each Illustration is matched to the new exam questions, math solutions & CFR references.

Gillis, Alan. **Study Guide for the United States Coast Guard 2011 Marine Engineering License Exam.** Two volumes. An excellent set of books that explains each illustration, cites its references, and gathers together all the questions that refer to each illustration.

Mileaf, Harry. (ed.), **Electricity One-Seven**, Revised 3<sup>rd</sup>. ISBN 0-13-917857-0. (MET Stock# BK-425). Although this book is almost 1,000 pages long, it covers many of the *basic electrical subjects* covered by existing USCG multiple-choice questions and answers. Every page uses simple colored illustrations that are extremely helpful in explaining the text material. As you thumb through the questions and answers that follow, you will see how many times we reference specific pages or sections in this textbook.<sup>(1)</sup> Although we organized the questions to help you study and go to lengths to explain many answers to the questions, we often direct you to a full and complete answer in this reference book.<sup>(2)</sup> Although this is an excellent reference book on most basic electrical subjects, it does **not** specifically refer to vessels and their electrical equipment. Yet, of the numerous textbooks on our shelves, we found this easy to understand and exceptionally well illustrated. Unfortunately, this book is *out of print*, but used copies including the earlier second edition are available through internet sources. Call us to help you find a used copy. Unfortunately, even this textbook cannot stand alone in preparing for a license exam on electrical theory. <sup>(1)</sup>*Study Guide: We use the abbreviation Op. Cit. (Latin: Opere Citato) and the author's name (Mileaf, H.) to refer to this book.* <sup>(2)</sup>*Of the reference books in the Coast Guard's bibliography, we found many were out of print and often unavailable.]*

Hubert, C. I. **Operating, Testing, and Preventive Maintenance of Electrical Power Apparatus**. ISBN 0-13-041774-2. (MET Stock #BK-229). Charles I. Hubert, Professor of Electrical Engineering at the U.S. Merchant Marine Academy, is the author of this impressive **college level text** that covers most of the electrical equipment found aboard ships. The book goes deeply into mathematical formulas that many applicants for limited-tonnage credentials may avoid if they are unable to cope with them. We cite references to this book as: *[Hubert, C.I., OTPEPA]* in order to distinguish it from the author's other books listed below. Topics from Professor Hubert's previous book are covered and updated in this book.

Hubert, C. I., **Preventive Maintenance of Electrical Equipment**, 2<sup>nd</sup>. ed. This book, written in 1969 deals with the type of electrical equipment found on ships. Many multiple choice questions were taken directly from text and illustrations in this book. We cite the older book as *[Hubert, C.I., PMEE]* in many questions that follow. Although this book is out of print and was replaced by the preceding entry, it may be available as a used book or found in some libraries.

Hubert, C.I., **Electric Machines – Theory, Operation, Applications, Adjustment and Control**, 2<sup>nd</sup>. edition. 2002. ISBN 978-81-0802-6. We cite this book as *[Hubert, C.I., Electric Machines.]*

Lister, E. C., **Electric Circuits and Machines**, 6<sup>th</sup>. ed., (MET Stock# BK-427). Out of Print.

Miller, Rex & Miller, Richard **Electric Motors** (Audel, 6<sup>th</sup>. Ed.). Out of Print but may be available as a used book.

NAVPERS (U.S. Navy), **Basic Electricity** (MET Stock# BK-142). & NAVPERS (U.S. Navy), **Basic Electronics** (MET Stock #BK-0402). These are two older books that are still available and the value of your tax dollars at work.

Oliver, Kenneth G. **Basic Industrial Electricity**, MET Stock #BK-0650. ISBN 0-8311-3006-7. This book offers down-to-earth coverage of basics for apprentice electricians and operating engineers (in some ways comparable to workboat engineers) called upon to maintain electrical equipment in industrial plants.

Phipps, Clarence. **Fundamentals of Electrical Control**. 1992. ISBN 0-88173-217-6.

Rockis, G. and Mazur, G., **Electrical Motor Controls**, 3<sup>rd</sup>. edition. 1992. ISBN 0-8269-1666-X (MET Stock# BK-265) is very useful and easy to follow in explaining basic rules for schematic diagrams as well as explaining many motor control and logic questions.

Terrell, David. **Electronics for Computer Technology**. ISBN 0-7668-3872-2.