NONRESIDENT TRAINING COURSE

February 1992

Fireman

NAVEDTRA 14104

Although the words "he," "him," and "his" are used sparingly in this course to enhance communication, they are not intended to be gender driven or to affront or discriminate against anyone.

PREFACE

By enrolling in this self-study course, you have demonstrated a desire to improve yourself and the Navy. Remember, however, this self-study course is only one part of the total Navy training program. Practical experience, schools, selected reading, and your desire to succeed are also necessary to successfully round out a fully meaningful training program.

COURSE OVERVIEW: By successfully completing this nonresident training course, you will demonstrate mastery of the following subject areas: engineering administration, and engineering fundamentals, the basic steam cycle, boilers, steam turbines, gas turbines, internal-combustion engines, ship propulsion, auxiliary machinery and equipment, instruments, shipboard electrical equipment, and environmental controls.

THE COURSE: This self-study course is organized into subject matter areas, each containing learning objectives to help you determine what you should learn along with text and illustrations to help you understand the information. The subject matter reflects day-to-day requirements and experiences of personnel in the rating or skill area. It also reflects guidance provided by Enlisted Community Managers (ECMs) and other senior personnel, technical references, instructions, etc., and either the occupational or naval standards, which are listed in the *Manual of Navy Enlisted Manpower Personnel Classifications and Occupational Standards*, NAVPERS 18068.

THE QUESTIONS: The questions that appear in this course are designed to help you understand the material in the text.

VALUE: In completing this course, you will improve your military and professional knowledge. Importantly, it can also help you study for the Navy-wide advancement in rate examination. If you are studying and discover a reference in the text to another publication for further information, look it up.

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Sailor's Creed

"I am a United States Sailor.

I will support and defend the Constitution of the United States of America and I will obey the orders of those appointed over me.

I represent the fighting spirit of the Navy and those who have gone before me to defend freedom and democracy around the world.

I proudly serve my country's Navy combat team with honor, courage and commitment.

I am committed to excellence and the fair treatment of all."

CONTENTS

INSTRUCTIONS FOR TAKING THE COURSE

ASSIGNMENTS

The text pages that you are to study are listed at the beginning of each assignment. Study these pages carefully before attempting to answer the questions. Pay close attention to tables and illustrations and read the learning objectives. The learning objectives state what you should be able to do after studying the material. Answering the questions correctly helps you accomplish the objectives.

SELECTING YOUR ANSWERS

Read each question carefully, then select the BEST answer. You may refer freely to the text. The answers must be the result of your own work and decisions. You are prohibited from referring to or copying the answers of others and from giving answers to anyone else taking the course.

SUBMITTING YOUR ASSIGNMENTS

To have your assignments graded, you must be enrolled in the course with the Nonresident Training Course Administration Branch at the Naval Education and Training Professional Development and Technology Center (NETPDTC). Following enrollment, there are two ways of having your assignments graded: (1) use the Internet to submit your assignments as you complete them, or (2) send all the assignments at one time by mail to NETPDTC.

Grading on the Internet: Advantages to Internet grading are:

- you may submit your answers as soon as you complete an assignment, and
- you get your results faster; usually by the next working day (approximately 24 hours).

In addition to receiving grade results for each assignment, you will receive course completion confirmation once you have completed all the assignments. To submit your assignment answers via the Internet, go to:

http://courses.cnet.navy.mil

Grading by Mail: When you submit answer sheets by mail, send all of your assignments at one time. Do NOT submit individual answer sheets for grading. Mail all of your assignments in an envelope, which you either provide yourself or obtain from your nearest Educational Services Officer (ESO). Submit answer sheets to:

COMMANDING OFFICER
NETPDTC N331
6490 SAUFLEY FIELD ROAD
PENSACOLA FL 32559-5000

Answer Sheets: All courses include one "scannable" answer sheet for each assignment. These answer sheets are preprinted with your SSN, name, assignment number, and course number. Explanations for completing the answer sheets are on the answer sheet.

Do not use answer sheet reproductions: Use only the original answer sheets that we provide—reproductions will not work with our scanning equipment and cannot be processed.

Follow the instructions for marking your answers on the answer sheet. Be sure that blocks 1, 2, and 3 are filled in correctly. This information is necessary for your course to be properly processed and for you to receive credit for your work.

COMPLETION TIME

Courses must be completed within 12 months from the date of enrollment. This includes time required to resubmit failed assignments.

PASS/FAIL ASSIGNMENT PROCEDURES

If your overall course score is 3.2 or higher, you will pass the course and will not be required to resubmit assignments. Once your assignments have been graded you will receive course completion confirmation.

If you receive less than a 3.2 on any assignment and your overall course score is below 3.2, you will be given the opportunity to resubmit failed assignments. **You may resubmit failed assignments only once.** Internet students will receive notification when they have failed an assignment--they may then resubmit failed assignments on the web site. Internet students may view and print results for failed assignments from the web site. Students who submit by mail will receive a failing result letter and a new answer sheet for resubmission of each failed assignment.

COMPLETION CONFIRMATION

After successfully completing this course, you will receive a letter of completion.

ERRATA

Errata are used to correct minor errors or delete obsolete information in a course. Errata may also be used to provide instructions to the student. If a course has an errata, it will be included as the first page(s) after the front cover. Errata for all courses can be accessed and viewed/downloaded at:

http://www.advancement.cnet.navy.mil

STUDENT FEEDBACK QUESTIONS

We value your suggestions, questions, and criticisms on our courses. If you would like to communicate with us regarding this course, we encourage you, if possible, to use e-mail. If you write or fax, please use a copy of the Student Comment form that follows this page.

For subject matter questions:

E-mail: n314.products@cnet.navy.mil
Phone: Comm: (850) 452-1001, Ext. 1826
DSN: 922-1001, Ext. 1826
FAX: (850) 452-1370
(Do not fax answer sheets.)
Address: COMMANDING OFFICER
NETPDTC N314
6490 SAUFLEY FIELD ROAD
PENSACOLA FL 32509-5237

For enrollment, shipping, grading, or completion letter questions

E-mail: fleetservices@cnet.navy.mil
Phone: Toll Free: 877-264-8583
Comm: (850) 452-1511/1181/1859
DSN: 922-1511/1181/1859
FAX: (850) 452-1370
(Do not fax answer sheets.)
Address: COMMANDING OFFICER
NETPDTC N331
6490 SAUFLEY FIELD ROAD
PENSACOLA FL 32559-5000

NAVAL RESERVE RETIREMENT CREDIT

If you are a member of the Naval Reserve, you may earn retirement points for successfully completing this course, if authorized under current directives governing retirement of Naval Reserve personnel. For Naval Reserve retirement, this course is evaluated at 9 points. (Refer to *Administrative Procedures for Naval Reservists on Inactive Duty,* BUPERSINST 1001.39, for more information about retirement points.)

Student Comments

Course Title: *Fireman*

NAVEDTRA: 14104 **Date**: _____

We need some information about you:

Rate/Rank and Name: _____ SSN: _____ Command/Unit _____

Street Address: _____ City: _____ State/FPO: _____ Zip _____

Your comments, suggestions, etc.:

Privacy Act Statement: Under authority of Title 5, USC 301, information regarding your military status is requested in processing your comments and in preparing a reply. This information will not be divulged without written authorization to anyone other than those within DOD for official use in determining performance.

NETPDTC 1550/41 (Rev 4-00

CHAPTER 1

ENGINEERING ADMINISTRATION

The Navy has many programs that will affect you at some time in your Navy career. In this chapter you will learn the basics of some of the programs that will affect you as a Fireman. This chapter is not designed to make you an expert in any of these programs, rather it will make you aware of their existence and advise you where to seek more in-depth information. Programs we discuss include only those you will need to know about while carrying out your assigned duties.

After studying this chapter, you should be able to identify the organizational structure of the engineering department, have a general understanding of each engineering rating, and be able to incorporate general safety precautions to perform your day-to-day tasks. You should be able to discuss with some accuracy the various programs pertinent to you as an engineer; that is, the planned maintenance system (PMS), the equipment tag-out program, and the engineering operational sequencing system (EOSS).

STANDARD SHIP ORGANIZATION

The responsibility for organization of the officers and crew of a ship belongs to the commanding officer by U.S. Navy regulations. The executive officer is responsible, under the commanding officer, for organization of the command. The department heads are responsible for the organization of their departments for readiness in battle and for assigning individuals to stations and duties within their respective departments. The *Standard Organization and Regulations of the U.S. Navy* manual (SORM), OPNAVINST 3120.32B, prescribes this administrative organization for all types of ships.

ORGANIZATION OF THE ENGINEERING DEPARTMENT

The SORM organizes the engineering department for the efficient operation, maintenance, and repair of the ship's propulsion plant, auxiliary machinery, and piping systems. The engineering department is responsible for (1) damage control, (2) operation and maintenance of electric generators and distribution systems, (3) repair to the ship's hull, and (4) general shipboard repairs.

The organization of each engineering department varies according to the size of the ship and the engineering plant. For example, forces afloat, such as repair ships and tenders, have a separate repair department with many engineering ratings responsible for off-ship repair and maintenance. These ships also have a standard ship's force engineering department. Smaller ships, because of the smaller number of engineering ratings aboard, combine many ratings into one division.

Figure 1-1 is an example of the organizational structure of the engineering department aboard any large ship. Note that the administrative assistant and the special assistants are aides to the engineer officer. These responsibilities are often assigned as additional duties to officers functioning in other capacities.

The three main assistants to the engineer officer are the main propulsion assistant (MPA), the electrical officer, and the damage control assistant (DCA). Each assistant is assigned the division(s) shown on the organization chart.

The division officers are responsible for the various divisions. The organization of each division by sections is set up by the watch, quarter, and station bill.

ENGINEER OFFICER

The engineer officer is the head of the engineering department. Besides the duties as a department head, the engineer officer is responsible for the following areas:

- Operation, care, and maintenance of all propulsion and auxiliary machinery
- Control of damage

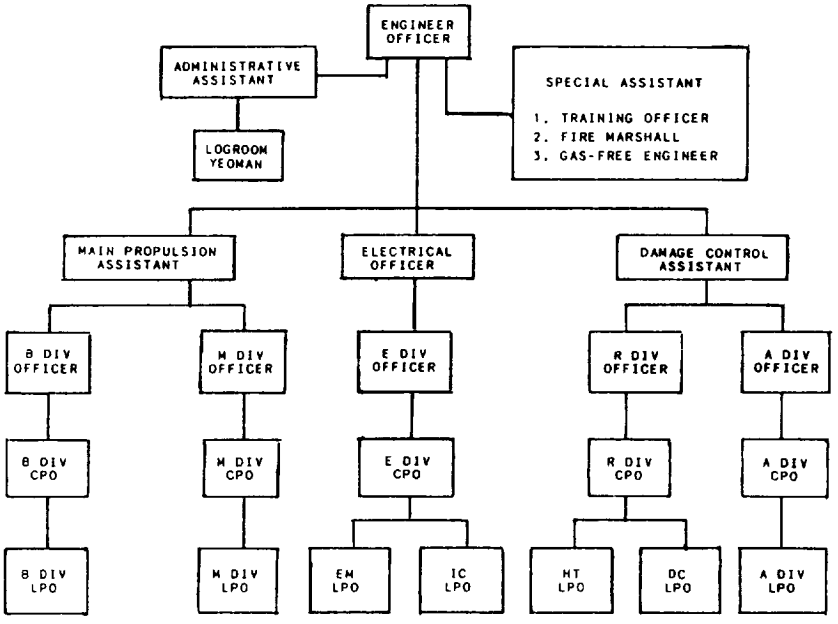

Figure 1-1.—Typical engineering department.

- Completion of all repairs within the capacity of the shops in the engineering department

For more detailed information about the duties and responsibilities of the engineer officer, refer to the *U.S. Navy Regulations*, the *Engineering Department Organization and Regulations Manual* (EDORM), and the SORM.

Assistants to the Engineer Officer

The engineer officer is assigned assistants for main propulsion, electrical, damage control, and other specific duties that are required for the proper performance of the functions of the engineering department. The engineer officer must make sure the assistants perform their assigned duties. In the following paragraphs, we will describe the duties of the administrative assistant, training officer, fire marshal, gas-free engineer, MPA, electrical officer, and DCA.

ADMINISTRATIVE ASSISTANT.— The department administrative assistant functions as an aide to the engineer officer in the details of administration. The responsibilities and duties of the department administrative assistant are as follows:

- Supervise the operation of the department administrative office; this includes the upkeep of assigned office spaces and the care and maintenance of office equipment.
- Screen all department incoming correspondence and initiate required action; also, screen and ensure correct preparation of all outgoing correspondence.
- Assist in the preparation of all department directives and exercise control over their issuance.
- Supervise the maintenance of department records and maintain a tickler file on all required reports.
- Coordinate the preparation of the department daily watch bill.
- Assign tasks to, and evaluate the performance of, department yeomen and other enlisted personnel assigned to the department office.

In an engineering department without an administrative assistant billet, the engineer officer may delegate the duties of such a billet to any competent person.

TRAINING OFFICER.— The duties of a department training officer are delegated by the