



**NONRESIDENT  
TRAINING  
COURSE**



January 1998

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# **Construction Electrician Basic**

**NAVEDTRA 14026**

**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.**

**DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.**

## PREFACE

By enrolling in this self-study course, you have demonstrated a desire to improve yourself and the Navy. Remember, however, this selfstudy 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.

**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.”

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# **SUMMARY OF THE CONSTRUCTION ELECTRICIAN TRAINING SERIES**

## **CONSTRUCTION ELECTRICIAN BASIC**

This training manual (TRAMAN) replaces *Construction Electrician 3* and should be studied by those seeking advancement to Construction Electrician Third Class.

## **CONSTRUCTION ELECTRICIAN INTERMEDIATE**

This TRAMAN, when published (refer to NAVEDTRA 12061 for availability), will replace *Construction Electrician 3 & 2* and should be studied by those seeking advancement to Construction Electrician Second Class. Topics in this book will be a continuation of information covered in the *Construction Electrician Basic* TRAMAN.

## **CONSTRUCTION ELECTRICIAN ADVANCED**

This TRAMAN, when published (refer to NAVEDTRA 12061 for availability), will replace *Construction Electrician 1* and should be studied by those seeking advancement to Construction Electrician First Class. Topics in this book will be a continuation of information covered in the *Construction Electrician Intermediate* TRAMAN.

# 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 (CODE 314)  
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 (CODE N331)  
6490 SAUFLEY FIELD ROAD  
PENSACOLA FL 32559-5000

## **NAVAL RESERVE RETIREMENT CREDIT**

If you are a member of the Naval Reserve, you will receive retirement points if you are authorized to receive them 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.)

## **COURSE OBJECTIVES**

In completing this nonresident training course, you will demonstrate a knowledge of the subject matter by correctly answering questions on the following subjects: Construction Support, Drawings and Specifications, Power Generation, Power Distribution, Interior Wiring, Communications and Lighting, and Electrical Appliances, Test Equipment, Motors, and Generators.

## Student Comments

**Course Title:** Construction Electrician Basic

**NAVEDTRA:** 14026 **Date:** \_\_\_\_\_

**We need some information about you:**

Rate/Rank and Name: \_\_\_\_\_ SSN: \_\_\_\_\_ Command/Unit \_\_\_\_\_

Street Address: \_\_\_\_\_ City: \_\_\_\_\_ State/FPO: \_\_\_\_\_ Zip \_\_\_\_\_

**Your comments, suggestions, etc.:**

<p><b>Privacy Act Statement:</b> 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.</p>
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NETPDTC 1550/41 (Rev 4-00)

# CHAPTER 1

## CONSTRUCTION SUPPORT

As a Construction Electrician you will be involved in many aspects of construction work. This chapter touches on a few of these, such as rigging and hoisting, equipment movement, hazardous material, embarkation, and tool kits. Although this chapter does not deal with electrical work, you need to study and refer back to this chapter for your safety and the safety of your shipmates.

### USING LINES AND SLINGS

The safety of personnel involved in rigging and hoisting operations largely depends upon care and common sense. Equally important is the proper selection of lines and slings for safe and stable lifts.

### INSPECTIONS

The single most important operational check to be made on hoisting and rigging equipment is the line and rigging inspection. Such factors as abrasion, wear, fatigue, corrosion, and kinking are of great significance in determining usable life.

The only way to determine the safety of a line, its life expectancy, and its load-carrying ability is by regularly inspecting every foot of its length. The main points to watch for are external wear and cutting, internal wear between the strands, and deterioration of the fibers.

### FIBER LINES

Fiber lines are made from either natural or synthetic fibers. The natural fibers come from plants and include manila, sisal, and hemp. The synthetic fibers include nylon, polypropylene, and the polyesters. The strength

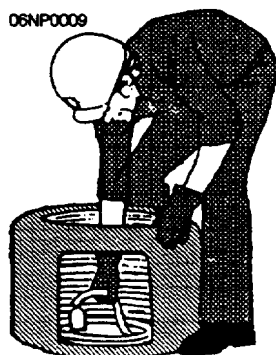


Figure 1-1.—Removing line from a shipping coil.

of these lines depends on their size, the fiber used, and the type of stranding.

### Uncoiling Line

New line is coiled, bound, and wrapped. The protective covering should not be removed until the line is to be used. This covering will protect the line during stowage and prevent tangling. To open, strip off the outer wrapping and look inside the coil for the end of the line. This should be at the bottom of the coil. If not, turn the coil over so that the end will be at the bottom, as shown in figure 1-1. Pull the end of the line up through the center of the coil. As the line comes up through the coil, it will unwind in a counterclockwise direction.

### Whipping Line

The term *whipping* refers to the process of securing the ends of a line to prevent the strands from unraveling and the yarns from separating or fraying. Whippings are made from fine twine and will not increase the size of the line enough to prevent it from fitting the blocks or openings.

Figure 1-2 shows the steps to follow in applying a whipping. Make a loop in the end of the twine and place

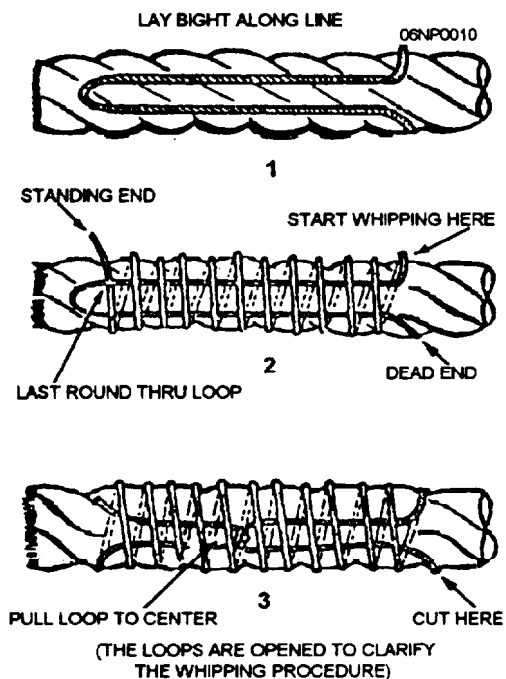


Figure 1-2.—Proper way to apply a line whipping.