



NONRESIDENT TRAINING COURSE

July 1997



Electronics Technician

Volume 1—Safety

NAVEDTRA 14086

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: After completing this course, you should be able to: **Discuss** the primary causes of mishaps and methods for preventing mishaps; **Identify** the safety related responsibilities of the typical chain of command, from the commanding officer down to the individual worker; **State** the minimum information required to be listed on a hazardous materials label; **Explain** the general requirements and restrictions associated with purchasing, storing, handling, using, and disposing of hazardous materials; **State** specific requirements and restrictions associated with purchasing, storing, handling, using, and disposing of solvents, aerosol containers, PCBs, batteries, vacuum tubes, and cathode-ray tubes; **Explain** the effects of electric shock on the human body and **state** the methods of preventing electric shock; **Identify** the primary sources of hazardous electromagnetic radiation and effects on the human body; **State** the purpose of the tag-out bill and the personnel responsibilities, documents, and procedures associated with tag-out; and **Identify** and **state** the purpose of the primary safety equipment associated with Electronics Technicians.

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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GSEC Steve Wheeler*

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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 ELECTRONICS TECHNICIAN TRAINING SERIES

This series of training manuals was developed to replace the *Electronics Technician 3 & 2* TRAMAN.

The nine volumes in the series are based on major topic areas with which the ET2 should be familiar. Volume 1, *Safety*, provides an introduction to general safety as it relates to the ET rating. It also provides both general and specific information on electronic tag-out procedures, man-aloft procedures, hazardous materials (i.e., solvents, batteries, and vacuum tubes), and radiation hazards. Volume 2, *Administration*, discusses COSAL updates, 3-M documentation, supply paperwork, and other associated administrative topics. Volume 3, *Communication Systems*, provides a basic introduction to shipboard and shore-based communication systems. Systems covered include man-pat radios (i.e., PRC- 104, PSC-3) in the hf, vhf, uhf, SATCOM, and shf ranges. Also provided is an introduction to the Communications Link Interoperability System (CLIPS). Volume 4, *Radar Systems*, is a basic introduction to air search, surface search, ground controlled approach, and carrier controlled approach radar systems. Volume 5, *Navigation Systems*, is a basic introduction to navigation systems, such as OMEGA, SATNAV, TACAN, and man-pac systems. Volume 6, *Digital Data Systems*, is a basic introduction to digital data systems and includes discussions about SNAP II, laptop computers, and desktop computers. Volume 7, *Antennas and Wave Propagation*, is an introduction to wave propagation, as it pertains to Electronics Technicians, and shipboard and shore-based antennas. Volume 8, *Support Systems*, discusses system interfaces, troubleshooting, sub-systems, dry air, cooling, and power systems. Volume 9, *Electro-Optics*, is an introduction to night vision equipment, lasers, thermal imaging, and fiber optics.

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: n315.products@cnet.navy.mil
Phone: Comm: (850) 452-1001, Ext. 1713
DSN: 922-1001, Ext. 1713
FAX: (850) 452-1370
(Do not fax answer sheets.)
Address: COMMANDING OFFICER
NETPDTC N315
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 2 points. (Refer to *Administrative Procedures for Naval Reservists on Inactive Duty*, BUPERSINST 1001.39, for more information about retirement points.)

Student Comments

Course Title: Electronics Technician, Volume 1—Safety

NAVEDTRA: 14086 **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.
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NETPDTC 1550/41 (Rev 4-00)

NAVAL SAFETY

HISTORY OF NAVAL SAFETY

Safety awareness in the Navy can be traced back to 1818. The old saying “hindsight is 20/20” probably came from a gunner who, in 1817, lit a candle in the powder magazine. His action not only sent him and his crew into orbit, but also helped introduce the first naval safety regulation. That regulation dealt with fire and the handling of black powder aboard ships. Since then, experience has played the major role in developing the safety programs of today’s Navy. Here is a brief listing of some major milestones in the history of naval safety:

- 1917—Safety engineers were assigned to each major naval shipyard.
- 1922—Safety programs for civilian employees were introduced at all naval activities.
- 1929—Enlisted personnel on shore duty were included in safety programs.
- 1947—The Navy Department Safety Council was organized under the Director of Safety of the Office of Industrial Relations (OIR). Its original mission was to coordinate safety procedures and to provide communications between the bureau safety engineers and the technical staff of the OIR safety branch. In 1957, the council’s mission was expanded to include the development and maintenance of the U.S. *Navy Safety Precautions Manual*, OPNAV 34P1 (superseded by OPNAVINST 5100.23, *Navy Occupational Safety and Health [NAVOSH] Program Manual*).
- 1951—The transition from propeller to jet aircraft helped the Secretary of the Navy (SECNAV) to establish the Naval Aviation Safety Council. In 1955, the title was changed to Naval Aviation Safety Center.
- 1963—The Navy was shaken by the loss of the USS *THRESHER* (SSN-593), in which 129 sailors were lost. A court inquiry was convened to examine the circumstances leading to and surrounding the incident. The court’s findings

resulted in the creation of the Submarine Safety Program (SUBSAFE). Its purpose was to impose high standards of quality control on submarine construction and operations. In 1964, the Chief of Naval Operations (CNO) established the Submarine Safety Center at the Submarine Base in New London, Connecticut, to examine and coordinate all matters of submarine safety.

- 1966-1967—The SECNAV tasked CNO to review the entire Navy Safety Program after a series of fires, collisions, and other mishaps involving surface ships resulted in over 200 deaths and more than 100 million dollars in damage. On 3 May 1968, as a result of CNO’s findings, the SECNAV established the Naval Safety Center.
- 1970—The Occupational Safety and Health Act (OSHA) of 1970 became law. Insofar as possible, this law assures safe and healthful working conditions for every working person in the nation.
- 1971—The Naval Safety Center assumed the responsibility for the Navy’s Defensive Driver Education Program.
- 1972—The Navy implemented its Motorcycle Training Course.
- 1973—The Commander, Naval Safety Center, was designated as the CNO Safety Coordinator (OP-09F), reporting directly to the Vice Chief of Naval Operations. This designation made the Naval Safety Center’s mission more specific and all-encompassing.

Now refer to the *Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat* (OPNAVINST 5100.19), chapter A2. Also read the *Standard Organization and Regulations of the U.S. Navy* (OPNAVINST 3120.32), chapter 7. The information in these chapters will enhance your knowledge of the NAVOSH program organization and