DEPARTMENT OF THE NAVY
COMMANDER
NAVAL EDUCATION AND TRAINING COMMAND
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LETTER OF PROMULGATION FOR NAVEDTRA 131B

1. This guidance manual has been extensively revised. Most of the revisions are in response to user comments and reflect a continuing effort to increase the manual's utility to the training field. NAVEDTRA 131B, Volumes I-III, supersedes and replaces NAVEDTRA 131A, dated: July 1997.

2. The procedures in this manual follow a Personnel Performance Profile (PPP) Based Curriculum Development method. This manual is intended for use by military, civil service, and contractor personnel engaged in Navy training materials development and modification.

3. Procedural guidance for development of training materials following a Task based method is published in NAVEDTRA 130 (series).

4. This publication is available electronically at: Navy Knowledge Online (NKO) - NETC N74 Learning Standards Homepage; and Navy Marine Corps Intranet's (NMCI) Total Records and Information Management (TRIM).

5. Corrections and comments concerning this manual are invited and should be addressed to the Naval Education and Training Command, attention: N7.

6. Reviewed and approved.

J. F. KILKENNY

PERSONNEL PERFORMANCE PROFILE BASED CURRICULUM DEVELOPMENT MANUAL

NAVEDTRA 131B

PERSONNEL PERFORMANCE PROFILE BASED CURRICULUM DEVELOPMENT MANUAL

FOREWORD

POLICY: New content development, revision, or maintenance within the Naval Education and Training Command (NETC) training domain, and training systems developed for NETC shall use the Authoring Instructional Materials (AIM) Content Planning Module (CPM), and Learning Object Module (LOM), unless waived by NETC N7 in formal correspondence. NAVEDTRA 136 is the reference document for content development, revision, or maintenance using AIM CPM/LOM.

NAVEDTRA SERIES MANUALS: The following is a current listing of NAVEDTRA series of manuals:

- NAVEDTRA 130: Task Based Curriculum Development Manual
- NAVEDTRA 131: Personnel Performance Profile Based Curriculum Development Manual
- NAVEDTRA 132: Navy School House Testing Management Manual
- NAVEDTRA 133: Navy Human Performance Requirements Review Management Manual
- NAVEDTRA 134: Navy Instructor Manual
- NAVEDTRA 135: Navy School Management Manual
- NAVEDTRA 136: Naval Education and Training Command Integrated Learning Environment Course Development and Life-Cycle Maintenance Manual
- NAVEDTRA 137: Job Duty Task Analysis Management Manual
- NAVEDTRA 138: Front End Analysis Management Manual
- NAVEDTRA 140: Training Support Management Manual

The NAVEDTRA series of manuals provide fundamental direction, within the NETC training domain, for the development of curricula, the delivery of instruction, and the management and evaluation of training programs.

These manuals do not supersede the directive policy established by Commander, NETC Instructions (NETCINSTs) in these subject areas. Rather, they supplement the NETCINSTs in two important ways. First, they reflect the philosophical principles underlying NETC policy for curriculum, instruction, and evaluation and second, they provide procedures for carrying out that policy.

Each of the NAVEDTRA series of manuals is designed as a stand-alone document to serve a specific user group such as curriculum

developers, instructors, training managers, or evaluators of training. The manuals are, however, interrelated and cross-referenced to one another.

SCOPE: The NAVEDTRA 131 (series)**,** Personnel Performance Profile (PPP) Based Curriculum Development Manual, provides guidance for developing curricula to teach operation and maintenance of hardware and/or performance of tasks or functions (hardware is any system/subsystem/equipment). The processes and illustrations found in NAVEDTRA 131 (series) reflect the experience of Subject Matter Experts (SMEs), curriculum developers, and decision makers who approve Navy training material developed by Navy curriculum developers and civilian contractors. NAVEDTRA 131 (series) describes and illustrates all facets of planning, analysis, design, and development of curricula. NAVEDTRA 131 (series) provides step-by-step guidance to curriculum developers for developing job-efficient and effective training material. NAVEDTRA 131 (series) consists of three (3) volumes.

Volume I is a Developer's Guide that contains procedural guidelines for the development of training programs. It is designed for use by the individual actually revising or developing training materials.

Volume II contains Sample Products of each of the management and curriculum documents in a format that is consistent with the format conventions discussed in Volume I.

Volume III is a Manager's Guide designed for the individual charged with the management of a course revision or development. The guide describes approval points, approval authorities, and the manager's responsibilities in each of the stages of PPP based curriculum development.

RELATIONSHIP TO DEPARTMENT OF DEFENSE (DoD) STANDARDS/ SPECIFICATIONS and AIM: Chapter titles in these manuals were derived from various DoD Standards and Specifications documents, which these manuals support. The name assigned to individual documents developed in accordance with these manuals must correspond with the document name used herein. Exceptions to this rule shall not be granted. AIM is a computer based training materials authoring tool developed by the Navy. Training materials developed using AIM may be different in appearance than examples shown in these manuals. However, all training material developed using AIM is compatible with the concepts of these manuals. If any instance exists where the

information in these manuals is in conflict or is not supported by the constraints of the AIM software, the information in these manuals takes precedence and must still be supported.

CONTRACTUAL USE OF MANUAL: NAVEDTRA 131 (series) sample documents may also be used as an exhibit in a contract as service-specific guidance for use by civilian contractors developing Navy training material.

NAME SUBSTITUTIONS ALLOWED: The CCA may allow the following name substitutions:

NAVEDTRA 130 AND 140 SERIES:	**OPTIONAL NAME**:
Lesson Plan (LP)	Instructor Guide (IG)
Written Test	Knowledge Test
Resource Requirements List (RRL)	Master Materials List/ Equipment Requirements List
Trainee	Student
Learning Site (LS)	Training Facility/Activity

IN PROCESS REVIEWS: Whether developed in-house or by a contractor, In Process Reviews (IPRs) will normally be conducted as follows to review the products. ("Bullets" indicate IPR points, followed by the products to be reviewed):

> **STAGE ONE**:
>
> - PPP Table Listing
> - Draft new and/or modified PPP Tables
> - Preliminary Training Path System (TPS)
>
> **STAGE TWO**:
>
> - Preliminary Training Course Control Document (TCCD)
>
> **STAGE THREE**:
>
> - Cross sections of LP, Trainee Guide (TG)/Instruction Sheets, Instructional Media Material (IMM) (Requirement for cross section and contents to be determined by CCA)
> - Draft LP, TG/Instruction Sheets, IMM Roughs, Testing Plan, Tests

STAGE FOUR:

- Conduct Pilot Course
- Pilot Course Monitoring Report
- Red-lined Curriculum

STAGE FIVE:

- Finalized TCCD, Curriculum, Letter of Promulgation

HOW TO USE NAVEDTRA 131 (SERIES): NAVEDTRA 131 (series) provides guidance and illustrations for use in the planning, analysis, design, development, implementation, and evaluation of curricula.

Volume I: Contains step-by-step guidance for developing effective training materials. All chapters in Volume I were written so you can follow along with the corresponding figures, diagrams, curriculum development aids, or examples presented in Volume II. It is important to open Volume II when referenced and study the appropriate illustrations.

Volume II: Contains examples of all curriculum material that make up a Course of Instruction (COI) developed under the PPP/TPS method. When you have located the sample document in Volume II that corresponds to the chapter you have selected in Volume I, keep the sample at hand as you read Volume I. For example, if you are developing a TPS, turn to the TPS section of the sample course in Volume II.

Volume III: Contains management information important to planning, analysis, design, development, implementation, and evaluation of curricula. The chapters in Volume III establish the requirements for the submission and review of the various products developed during the curriculum development process.

CHANGE RECORD

Number and Description of Change	Entered By	Date

PERSONNEL PERFORMANCE PROFILE BASED CURRICULUM DEVELOPMENT MANUAL VOLUME I DEVELOPER'S GUIDE

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

NAVEDTRA 131B

PERSONNEL PERFORMANCE PROFILE BASED CURRICULUM DEVELOPMENT MANUAL VOLUME I

DEVELOPER'S GUIDE

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INTRODUCTION

CHAPTER 1

TRAINING MATERIALS DEVELOPMENT

INTRODUCTION

The core procedures for developing training materials following the Personnel Performance Profile (PPP) Based Curriculum Development method consists of five interrelated Stages. The five stages are preceded by planning, and followed by training materials evaluation, surveillance and modification. A curriculum development project is a complex undertaking bringing together a wide range of human and material resources for the goal of creating quality training.

PLANNING identifies resources requirement and the sequence of events in the development process.

STAGE ONE consists of determining job tasks, supporting skills and knowledge, and level of performance.

STAGE TWO determines the skills and knowledge which must be taught and produces the course learning objectives and an instructional sequence.

STAGE THREE produces the instructional materials for the instructor and the trainee.

STAGE FOUR begins when the Curriculum Control Authority (CCA) has approved a course for pilot and ends with submittal of the Pilot Course Monitoring Report.

STAGE FIVE begins after incorporation of the results of the pilot course ("red-line") into smooth curriculum and management materials, and ends with the CCA's Letter of Promulgation that approves the material for use in support of Navy training.

EVALUATION is the surveillance, evaluation, change, and revision of the training materials based on assessment of the training materials and the performance of the graduates in the fleet.

NAVEDTRA 131B: PPP Based Curriculum Development is designed to guide Navy activity personnel (curriculum developers) in the development of accurate and effective training materials. This manual:

- Specifies the tasks necessary to develop and support training materials.
- Establishes the sequence of task performance.
- Assigns task performance responsibilities.

1-2

NOTE

Since the initial writing of this guidance naval training has evolved to include a variety of different training solutions that were not available in the past such as Computer Based Training (CBT), Blended Training, and the Integrated Learning Environment (ILE) just to name a few. Although this volume focuses on PPP Based Curriculum Development the foundational principles explained in this volume such as the development of test items, piloting process, and planning and development of a Training Project Plan (TPP) can and should be utilized with the evolution of new training solutions.

```
PLANNING - CCA/Functional Commander/NETC/OPNAV (=)
    ■ TPP

STAGE ONE (*)
    ■ PPP Table List
    ■ New and Modified PPP Tables
    ■ Training Path System (TPS)

STAGE TWO - CCA
    ■ Preliminary Training Course Control Document (TCCD)

STAGE THREE
    ■ Instructional Materials Cross Section (if required)
    ■ Lesson Plan (LP)
    ■ Trainee Guide (TG)
    ■ Tests
    ■ Other Support Materials

STAGE FOUR - CCA
    ■ Course Pilot
    ■ Pilot Course Monitoring Report

STAGE FIVE
    ■ Final Curriculum
    ■ Final TCCD (*)
    ■ Letter of Promulgation

EVALUATION
    ■ Internal          [= Approval Authority]
    ■ External          [* Approval Authority]
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FIGURE 1-1: CURRICULUM DEVELOPMENT PROCESS

SECTION 1 - TRAINING MATERIALS

Training materials include management materials, curriculum materials, and support materials. These training materials are developed following the guidelines of this manual.

NOTE

Recognizing the complexity of training materials development and the external factors which influence curriculum development projects, this manual is to be used as a guideline, not as a prescriptive document. Waiver of any document or procedure is at the discretion of the CCA. The CCA may also require additional documents or reviews.

Authoring Instructional Materials (AIM): AIM is a computer based training (CBT) materials authoring tool developed by the Navy. Training materials developed using AIM may be different in appearance than examples shown in this manual. However, all training materials developed using AIM are compatible with the concepts of this manual and are deemed to be correctly formatted. NETC Learning Centers (LCs), or as designated, shall use the appropriate AIM application for the Plan, Analyze, and Design Phases of curriculum development. The develop phase may also be used if applicable and achievable. AIM I is for PPP Based Development and AIM II is for Task Based development that is discussed in detail in NAVEDTRA 130 (series).

1.1. Management Materials. Management materials define training requirements and provide an overall plan for the accomplishment of these requirements. The chapters of this manual provide detailed content requirements and format conventions for the development of management materials. Management materials for training materials development include:

- TPP discussed in Chapter 2
- PPP Tables discussed in Chapter 3
- TPS discussed in Chapter 4
- TCCD discussed in Chapter 5
- Testing Plan discussed in Chapter 8 and NAVEDTRA 135 (series)
- Pilot Course Monitoring Report discussed in Chapter 10
- Audit Trail Documentation discussed in NAVEDTRA 135 (series)

1.2. Curriculum Materials. Curriculum materials include all materials required for the presentation of information and the development of skills in formal school training. Chapters in this manual contain detailed content requirements, format conventions, and development guidelines for curriculum materials. Under this definition, curriculum materials include:

- LP discussed in Chapter 6
- TG discussed in Chapter 7
- Test Package discussed in Chapter 8 and NAVEDTRA 135 (series)
- Other Materials helpful in the preparation and presentation of Lesson Topics (LT) (e.g. Exercise Controller Guide)

1.3. Support Materials. Support materials are instructional materials and other devices used in support of formal instruction, informal instruction, or for independent study. Chapter 9 of this manual provides more detail on Visual Information (VI) and Instructional Media Materials (IMM). The following are the most common support materials:

- VI includes:

  - Wall Charts (WC)
  - Films
  - Digital and Video Tapes
  - Transparencies
  - Graphic Media Presentations (PowerPoint, etc.)

- IMM includes:

  - On-the-Job Training (OJT) Handbook

- Textbooks include:

  - Technical Manuals to include Interactive Electronic Technical Manuals (IETM)
  - Training Devices (TD)
  - Other materials helpful in the preparation and presentation of LTs, such as a Fault Insertion Guide, or Instructor Utilization Handbook

SECTION 2 - TRAINING MATERIALS SUPPORT

All training materials are maintained current and accurate by surveillance and change efforts.

2.1. Surveillance. Constant surveillance is required to detect changes in documentation, equipment, or procedures that impact training materials. Procedures for identifying training material deficiencies, recommending changes, and coordinating recommended changes are given in Volume III. Some triggers that may direct a surveillance action be taken are:

- Updated Occupational Standards (OCCSTD)
- Job Duty Task Analysis (JDTA)
- Rating Mergers/Consolidations
- Rating Disestablishments
- Requirements Sponsor Changes
- Naval Training System Plan Revisions (NTSP)
- Change to existing operating procedure or policy
- Change in Technical Directives
- Change in Navy Mission Essential Task Lists (NMETLS)

2.2. Training Materials Modifications. There are four categories of training materials modifications: Interim Change, Change, Technical Change, and Revision. Definition for each category is found in NAVEDTRA 135(series), Chapter 4, Section 1.3. Procedures for incorporating training materials modifications are described in the sections for those materials in Volume III, Chapter 9, of this manual.

SECTION 3 - PROGRAM PARTICIPANTS

The following participants have vital roles in the development and support of training materials. Specific command assignments are addressed in Volume III, Chapter 1, of this manual.

3.1. Training Agency (TA). TA is an office, bureau, command, or headquarters exercising command of and providing support to some major increment of the Department of the Navy's formal training effort. Commander, Naval Education and Training Command (NETC) is a Training Agency (TA).

3.2. Training Support Agency (TSA). TSAs are offices, commands, or headquarters responsible for providing material and other forms of support to the TA. The TSA is normally a Systems

Command (SYSCOM) (e.g., Naval Sea Systems Command) responsible for providing training support to the TA for a piece of equipment, a system, or a subsystem.

3.3. LCs/Functional Commander (FC). NETC has designated LCs and/or FCs to plan, manage, and budget for training courses across broad functional areas.

3.4. Curriculum Control Authority (CCA). The CCA controls the course content and instructional methods by acting as approval authority for the curriculum. The CCA is also responsible for maintaining the curriculum through new development or revision of training materials. For courses conducted at schools under other FCs, the CCA will advise the other FC of curriculum development/revision efforts which result in additional resource requirements, new course lengths, and/or course convening schedule requirements. Volume I of NAVEDTRA 10500, Catalog of Navy Training Courses (CANTRAC) in the Corporate enterprise Training Activity Resource System (CeTARS) identifies the CCA for existing courses. NETC LC Commanding Officers (COs) are designated as the CCA. Additionally, Type Commanders (TYCOMs), Joint Weapons Training Command, and Operational Units which develop, deliver, and maintain training can also be designated as the CCA. The original intended functional control identification of the Course Identification Number's (CIN's) single letter for the most part may not always be the case due to changes in the Navy Training organization by the Revolution in Training (RIT) and/or LC stand-up, merge, and disestablishments. NAVEDTRA 135 (series), Chapter 1, delineates the CCA duties and responsibilities that NETC retained and are further amplified in NETCNOTE 1500 of 4 January 2010 concerning CCA duties retained by NETC.

3.5. Course Curriculum Model Manager (CCMM). A CCMM is assigned by the CCA with the responsibility for conducting and maintaining a specific course. The CCMM initiates curriculum development and training materials modification, conducts curriculum reviews and analysis of feedback, maintains course audit trail documentation, and develops and approves changes. The CCMM normally functions as the developer for Navy in-house-developed courses. However, the CCA can also designate personnel, other than the assigned CCMM as required, to perform these functions. CCMM functions as the developer and first line of approval authority for in-house and contract developed curriculum.

3.6. Learning Site (LS): Is a Navy command, which has a primary mission of conducting or supporting training usually at school or institution where courses are offered. The LS has responsibility for maintaining selected audit trail documents, annually reviewing training materials in the form of a Formal Course Review (FCR), making recommendations to the CCMM for changes/revisions, and maintaining training equipment and facilities.

SECTION 4 - APPLICABLE DOCUMENTS

The documents listed in Sections 5 and 6 are the primary resources to be used by activity developers in the design and development of training materials. Use of documents and manuals in effect on the date stated in the project plan is assumed. Later issues of these specifications, standards, documents, and publications, or new specifications, standards, documents, and publications, may be used subject to joint agreement of the CCA and activity curriculum developers.

SECTION 5 - STANDARDS, GENERAL

In June 1994 the Secretary of Defense (SECDEF) directed that "Performance specifications shall be used when purchasing new systems, major modifications, upgrades to current systems, and non-developmental and commercial items for programs in any acquisition category (in lieu of Military Specifications and Standards)."

NOTE

SECDEF Memo, Specifications and standards - A New Way of Doing Business, of 29 June 1994. Consequently, references to Military Standards (MIL-STDS) have been deleted.

5.1. Department of Defense:

- DoDDIR 5000.01 Military Handbook (MIL - HDBK) 502

SECTION 6 - PUBLICATIONS

6.1. Secretary of the Navy:

- SECNAVINST 5870.4 (series), Copyright
- SECNAVINST 5510.30 (series), Department of the Navy Personnel Security Program Instruction

6.2. Chief of Naval Operations:

- OPNAVINST 1500.27 (series), Inter-service Training
- OPNAVINST 1500.47 (series), Navy Training Quota Management
- OPNAVINST 1500.74 (series), Utilization of Enlisted Occupational Standards for Training and Career Development
- OPNAVINST 1500.75 (series), Safety Policy and Procedures for Conducting High Risk Training
- OPNAVINST 1500.76 (series), Navy Training System Requirements, Acquisition, and Management
- OPNAVINST 3500.34 (series), Personnel Qualification Standards (PQS) Program
- OPNAVINST 3500.39 (series), Operational Risk Management
- OPNAVINST 5100.19 (series), Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
- OPNAVINST 5100.23 (series), Navy Safety and Occupational Health (SOH) Program Manual
- OPNAVINST 3104.1 (series), Navy Visual Information Program Policy and Responsibilities
- OPNAVINST 5513.1 (series), Department of the Navy Security Classification Guide
- OPNAVINST 1510.10 (series), Corporate enterprise Training Activity Resource System (CeTARS) Catalog of Navy Training Courses and Student Reporting Requirements
- OPNAVINST 11102.2 (series), Training System Installation and Transfer
- NAVPERS 18068 (series), Volume I and Volume II Manual of Navy Enlisted Manpower and Personnel Classifications and Occupational Standards (NEOCS)

6.3. Commander, Naval Education and Training Command:

- NETCINST 5100.1 (series), Safety and Occupational Health, and High-Risk Training Safety Program Manual
- NAVEDTRA 130(series), Task Based Curriculum Development Manual
- NAVEDTRA 131 (series), Personnel Performance Profile Based Curriculum Development Manual
- NAVEDTRA 134 (series), Navy Instructor Manual
- NAVEDTRA 135 (series), Navy School Management Manual
- NAVEDTRA 10052-AJ, Bibliography for Advancement Study
- NAVEDTRA 10500, Catalog of Navy Courses (CANTRAC)
- NAVTRASYSCEN P-530, Naval Training Systems Center Guide
- NETCINST 1500.3 (series), Institutional Accreditation

- NETCINST 1500.4 (series), Inter-service Training Review Organization (ITRO)
- NETCINST 1510.1 (series), Navy Training Management
- NETCINST 3104.1 (series), Naval Education and Training Command (NETC) Visual Information (VI) Program Management
- Training Requirements Data Base Annual Report - Naval Education and Training Program Management Support Activity (NETPDTC)

6.4. OTHER:

- MPT&E CIOSWIT-ILE-STD-1B Navy ILE Presentation Standards
- MPT&E CIOSWIT-ILE-GUID-3B Navy ILE Instructional Content Style guide, Interactive Multimedia Instruction & Instructor Led Training
- DoD MILHDBK 29612.3A DoD HDBK Development of Interactive Multimedia Instruction (IMI) (Part 3 of 5)
- MIL-PRF-29612B Training Data Products
- MIL-HDBK 29612-1A Guidance for Acquisition of Training Data Products and Services (Part 1 of 5)
- MIL-HDBK 29612-2A Instructional Systems Development / Systems Approach to Training and Education (Part 5 of 5)
- MIL-HDBK 29612-4 Glossary for Training (Part 4 of 5)
- MIL-HDBK 29612-5 Advanced Distributed Learning (ADL) Products and Systems (Part 5 of 5)
- NAVSEAINST 4790.8 (series) Ships Maintenance and Material Management (3-M) Manual (Volume 1-3)

SECTION 7 - SECURITY REQUIREMENTS

Classified information will be handled per the Department of the Navy (DON) Information Security Program (SECNAVINST 5510.36 series).

SECTION 8 - SAFETY REQUIREMENTS

Safety, occupational health, and hazard awareness information must be incorporated into the curricula of all appropriate training courses, as prescribed by NETCINST 5100.1 (series) and NAVEDTRA 135 (series).

PLANNING

CHAPTER 2

TRAINING PROJECT PLAN

INTRODUCTION

A curriculum development project is a complex undertaking, bringing together a wide range of human and material resources for the goal of creating quality training. Curriculum development consists of six phases, beginning with the Plan Phase. This phase consists of gathering information and building the plan for training material revision or development. The output product of this phase is a Training Project Plan (TPP). When approved, the TPP is the authorization to undertake a course revision or a new course development project and initiate resource requisitions.

SCOPE

* Describe the factors to be considered when developing a TPP for new course development or course revision
* Provide guidelines for the content and format of the TPP

SECTION 1 - PLANNING FOR COURSE REVISION OR NEW COURSE DEVELOPMENT

Most TPPs for in-house development will be for revisions to existing courses; reflecting the constant introduction of new equipment, processes, and technologies into the Fleet. Although fewer in number, new course development projects respond to new requirements that cannot be met by revising an existing course.

* The Plan Phase is the first of the **six phases** of training materials development process. The output, the TPP, provides the blueprint for revising an existing course or developing a new course.
* A TPP is required to document any of the **seven triggers**. These triggers are:

  * New Training Course
  * Modified Training Course (Revision)
  * Change in Course Instructional Strategy or Delivery Method
  * Change in Course length
  * Training Course deletion
  * Training Course transfer between Course Curriculum Control Authority (CCA)
  * Course Data Processing (CDP) deletion/addition

- Other applications for the TPP are discussed in NETCINST 1510.1 (series), NAVEDTRA 135 (series) Course Revision. Prior to starting the revision to an existing course or development of a new course, a TPP shall be developed and approved in accordance with NETCINST 1510.1 (series).

NOTE

COURSE REVISION: A TPP will be developed and approved per NAVEDTRAs 135, 130, and 131 (series) as well as supplemental guidance as specified in NETCNOTE 1500 of 4 January 2010.

1.1. NEW COURSE DEVELOPMENT. Completing a TPP for new course development requires establishing a Course Identification Number (CIN), CDP, initiating entries for the Catalog of Navy Training Courses (CANTRAC) and Corporate enterprise and Training Activity Resource System (CeTARS), identifying preliminary resource requirements, and possibly planning for facilities requirements. This entails careful research and documentation. See NAVEDTRA 135 (series) for specific guidance on establishing a new course.

1.2. COURSE DEACTIVATION. NETCINST 1510.1 (series), NETCNOTE 1500 of 4 January 2010, and NAVEDTRAs 130, 131, and 135 (series) contain procedures for initiating and documenting the deactivation of an existing course or training program.

SECTION 2 - JUSTIFICATION FOR COURSE REVISION OR DEVELOPMENT

There must be a reason (or reasons) to undertake the development of a new course, the revision of an existing course or the deactivation of a course. The justification may come from:

- Navy Training System Plan (NTSP), OPNAVINST 1500.76 (series)
- Tasking by higher authority (Requirements Sponsor)
- Internal course reviews and local command initiatives
- External course reviews
- Surveillance and external feedback
- Training appraisal
- Updated Occupational Standards
- Enlisted Rating Mergers
- Human Performance Requirement Review (HPRR)

2.1. Training Project Plan (TPP):

- The TPP presents a blueprint for curriculum development which contains course data, justification(s) for the course revision or new course development, or course deactivation, impact statements, milestones, and resource requirements.
- The TPP is generally viewed as a management document. Detailed TPP content descriptions can be found in Volume III, Chapter 2.

NOTE

Each TPP will be as unique as the project it describes. The CCA, working with the Functional Commander (FC) and the TPP developer, shall designate mandatory TPP elements, and possibly call for additional data, which will reinforce the project plan. All data should be researched, referenced, and as accurate as possible. However, the TPP is recognized as a planning document, subject to revision.

2.2. Purpose and Use of a TPP. Describes all training and training support elements required to provide trained personnel to operate and maintain systems or equipment or to perform tasks and functions.

- It provides a Plan of Action and Milestones (POA&M) to achieve a predetermined implementation date.
- It describes all the factors necessary to prepare and conduct a successful training program and attain optimum use of personnel, hardware, and funds.
- It should meet, and not exceed, the training requirement.

2.3. Categories of Resources. Course development, and often course revisions, requires resources to develop or implement the proposed course. Resources fall into four broad categories: (1) facilities; (2) funding; (3) personnel; and (4) equipment. All four categories require long lead-time planning. An approved TPP is the authority to submit requests for resources. Whenever resources are affected (i.e. unfunded requirement), Chief of Naval Operations (CNO) requirement per Memorandum for Distribution 7000 N1 127189 of 15 September 2008 requires a TPP submission to OPNAV (N15) via NETC (N7) for approval and resource allocation. In the case of a course deactivation, the TPP provides justification for the action and a blueprint for reallocation of resources.

2.4. Initiating a TPP. The decision to prepare a TPP can come via the Commanding Officer/Officer-In-Charge (CO/OIC) of a Training Activity or higher authority or the Training Support Activity.

- The CCMM will develop and submit the TPP for a course revision or deactivation.
- The CCA can designate an activity to be the CCMM for a new course and direct them to develop the TPP, or it may be developed by the CCA.

2.5. TPP Outline

- The TPP shall contain all the data and information necessary to identify and justify resources required for the training course under consideration

NOTE

Volume II contains a sample TPP with typical entries. It must be emphasized that the entries selected, and the data presented for your TPP will be determined by the requirements of the project. Volume III, Chapter 2, provides information on completing TPP entries.

- Specific elements of data and information shall include the following items where applicable:

  - Cover Page
  - Table of Contents
  - Justification
  - Impact if the course development, revision, or deactivation is not undertaken
  - Course Data Page
  - Safety Risks and Hazardous Materials exposure
  - Curriculum development method recommended
  - Resource Requirements
  - Milestones

2.6. PLANNING QUICK REFERENCE CHECKLIST

- **PLANNING PRODUCT.** The TPP is a proposal to develop a new course or revise an existing course.
- **TPP CONTENTS.** Use the checklist provided to ensure that your TPP includes applicable elements from those listed.

ELEMENT	CHECK HERE
1. Cover Page	☐
2. Table of Contents	☐
3. Justification	☐
4. Compensation	☐
5. Course Data Page	☐
6. Safety Risks and Hazardous Materials Exposure	☐
7. Curriculum Development Method Recommended	☐
8. Required Resources	☐
9. Milestones	☐

FIGURE 2-1 - TPP CONTENTS CHECK LIST

- **PLANNING REFERENCES**

  - NAVEDTRA 131 (series), Volume I, Chapter 2
  - NAVEDTRA 131 (series), Volume II, Tab A-1
  - NAVEDTRA 131 (series), Volume III, Chapter 2

STAGE ONE

CHAPTER 3

PERSONNEL PERFORMANCE PROFILES

INTRODUCTION

In the previous chapter you were told how to develop a plan to revise an existing course or develop a new one. The output of the chapter was a Training Project Plan (TPP). The TPP is the blueprint for the entire project. When the TPP is approved, you are authorized to begin work on the next step in the project. Prior to a TPP input, a Job Duty Task Analysis (JDTA), a Front End Analysis (FEA), and a Business Case Analysis (BCA) shall be accomplished. In developing a TPP, LCs are directed to complete JDTA, FEA, and BCA prior to the TPP development and reference these documents when reviewing submitted TPP for approval.

Having received approval of your TPP, developing Personnel Performance Profiles (PPPs) will be your first real step in satisfying the training requirements.

The Training Requirement and PPP course development is initiated by a training requirement, as shown below:

- A need to train sailors to operate and/or maintain a specified piece of hardware
- A requirement to train Navy personnel to perform a designated shipboard job other than operation/maintenance of a particular hardware
- All training provided to satisfy this requirement must be accurate and job-related
- Identifying by analysis; all skills and knowledge associated with performance of the requirement
- Compiling these skills and knowledge into a list

NOTE

Skills and knowledge lists go by various names, dependent upon where the list is being described. PPP is the name given this manual's skills and knowledge list.

- Having received approval of your TPP. Developing the PPP(s) will be your first real step toward satisfying the training requirement

SCOPE

To provide information vital to understanding PPPs and to explain terminology which acquires a unique meaning when applied to PPPs.
To explain the systematic process for developing PPP Tables as

presented in Curriculum Developer Aids (CDA) and the PPP Model Statements.

NOTE

The CDAs for PPP Table Development and Model Statements lead you step-by-step through development of a PPP table but does not explain the "how" of the process. The CDAs and Model Statements enable you to develop a PPP table(s) relatively quickly and easily. These CDA's can be found in Volume III, Appendix A.

SECTION 1 - WHAT ARE PPPs?

1.1. PPPs are:

- Lists of required skills and supporting knowledge
- The foundation for ALL curriculum development

NOTE

A PPP is a minimum listing of knowledge and skills required to operate and maintain a system, subsystem, or equipment, or to perform a task or function.

1.2. PPPs are required for developing:

- Training Path System (TPS)
- Course and Topic Learning Objectives (CLOs/TLOs)
- Test Items and Tests
- Lesson Plan (LP) and Trainee Guide (TG)
- Support Materials

1.3. Importance of PPP. The single most important elements of PPP curriculum development are:

- Quality curricula result from quality PPPs
- Poor PPPs lead to a poor curriculum
- Curriculum development requires that all PPPs be developed first because PPP line items are used throughout a curriculum

SECTION 2 - PPP CATEGORIES/TYPES

2.1. PPP categories are:

- Hardware System, Subsystem, and Equipment
- Non-Hardware Task/Function and Background

NOTE

Use of these terms will be helpful later on when system/subsystem/equipment PPPs, and task/function and background PPPs, are grouped together and collectively discussed.

2.2. PPP types are:

```
┌─────────────┐         ┌──────────────┐
│ System      │         │              │
│ Subsystem   ├─────────┤  HARDWARE    │
│ Equipment   │         │              │
└─────────────┘         └──────────────┘

┌─────────────┐         ┌──────────────┐
│ Task/Function├────────┤              │
│ Background   │        │ NON-HARDWARE │
└─────────────┘         └──────────────┘
```
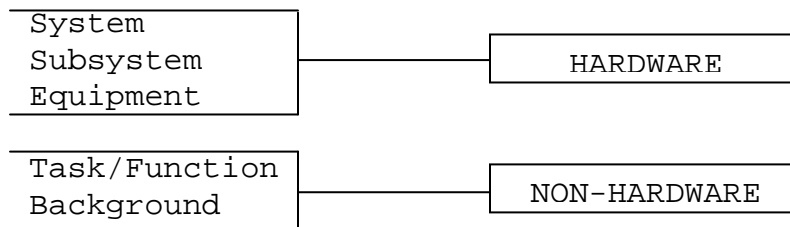
NOTE

Most training programs use a combination of PPPs from the above types during design and development.

2.3. Volume II, Tab A-2, for PPP Table examples

- System PPP – F0147
- Subsystem PPP – F0156
- Equipment PPP – F0194/F0202
- Task/Function PPP – B0076
- Background PPP – A0002

2.4. Hardware PPP types defined

- SYSTEM – may be:

  - Related subsystems which operate together to meet a strategic or tactical requirement; e.g., Weapons Platform: A Submarine or Surface Ship or Aircraft
  - Related components or equipments established to perform a certain mission or functions; e.g., AN/SQQ-89(V)3 SURFACE ASW COMBAT "SYSTEM"
  - Single or multi-purpose

3-4

NOTE

These PPPs list the knowledge and skills required to operate and maintain a system.

- SUBSYSTEM – can only be:

  - Related equipments which together perform particular functions that contribute to the overall system mission; e.g., X-1B IFF "System" or Ship's Departments: Combat Systems, Operations, Engineering

NOTE

These PPPs list the knowledge and skills required to operate and maintain a subsystem.

- EQUIPMENT – may be either:

A unit of a subsystem for which operation and maintenance can be performed

OR

Any device that supports any system or subsystem; Equipments are made up of various components; e.g., AN/UYQ-21, UYK-44, C-1678/APX IFF CONTROL.

NOTE

These PPPs list the knowledge and skills required to operate and maintain equipment.

2.5. Hardware PPP Table Relationships:

- It is possible that the same hardware may logically be designated as being either:

  - A system
  - A subsystem
  - Or equipment

- What to call this hardware depends upon:

  - Size and complexity
  - Eventual usage and developer's intent

NOTE

Thus, these Hardware types are not necessarily fixed when applied to a specific hardware.

- Hardware PPP types are often directly related to one another:

  - Any equipment can be part of a subsystem; subsystem can be part of a system
  - Two or more related equipments can make up a subsystem, and
  - Two or more related subsystems can comprise a system

2.6. To best determine PPP types/titles, do the following:

- Designate the weapons platform (ship, aircraft, etc.) to be the system
- Designate the weapons platform "department" (weapons, engineering, power plant, airframe, etc.) as the subsystem
- Determine to develop system/subsystem PPPs only if needed
- Recognize that most makers of military hardware call their Whatever hardware a "system," when their system is probably "Equipment" thus, the systems become equipment PPPs
- Write the system PPP title and subsystem PPP titles needed for your training program
- Write-in orders the titles of the equipment, task/function, and background PPP tables that are required

NOTE

This somewhat involved process helps to ensure that only the PPPs that are necessary for the training program are developed.
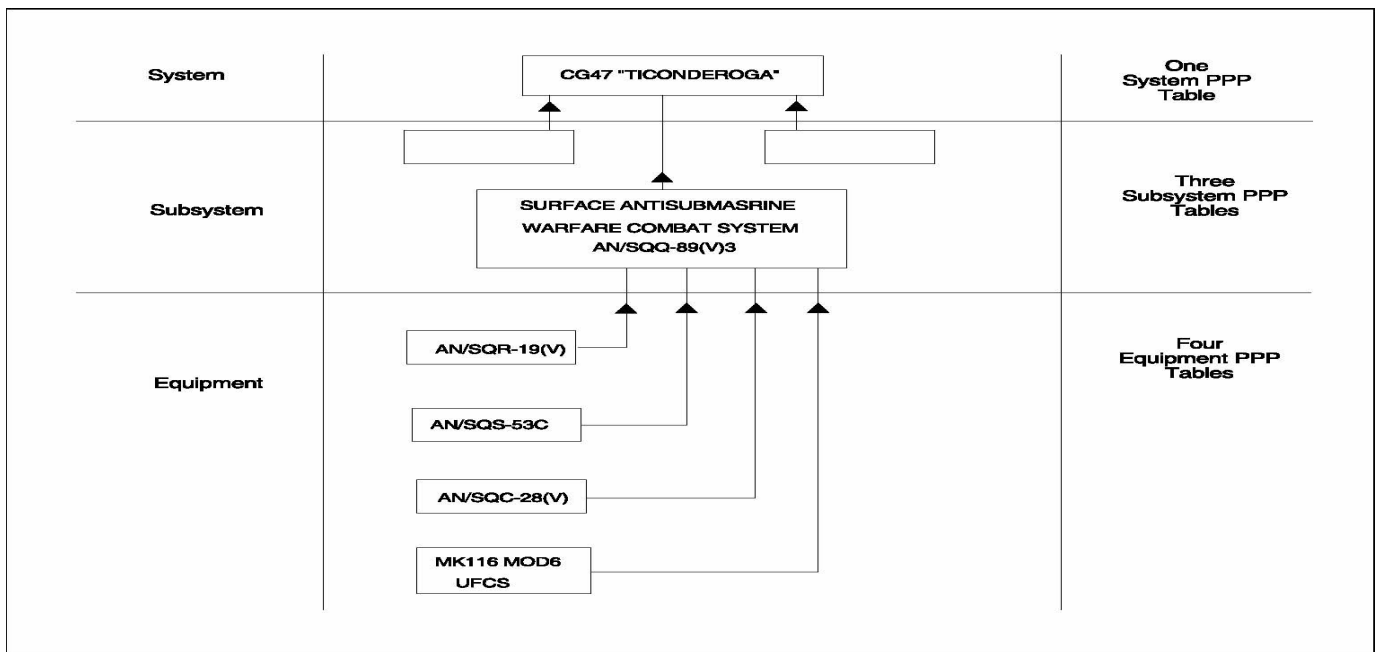
FIGURE 3-1: THE WEAPONS PLATFORM AS THE SYSTEM

FIGURE 3-1 shows the weapons platform—TICONDEROGA—as being the System

- One of this ship's Subsystems is the AN/SQQ-89(V)3 ASW COMBAT "SYSTEM"
- AN/SQQ-89(V)3-related Equipments are the AN/SQR-19(V), AN/SQS-53C, AN/SQC-28(V), and MK 116 MOD 6 UFCS
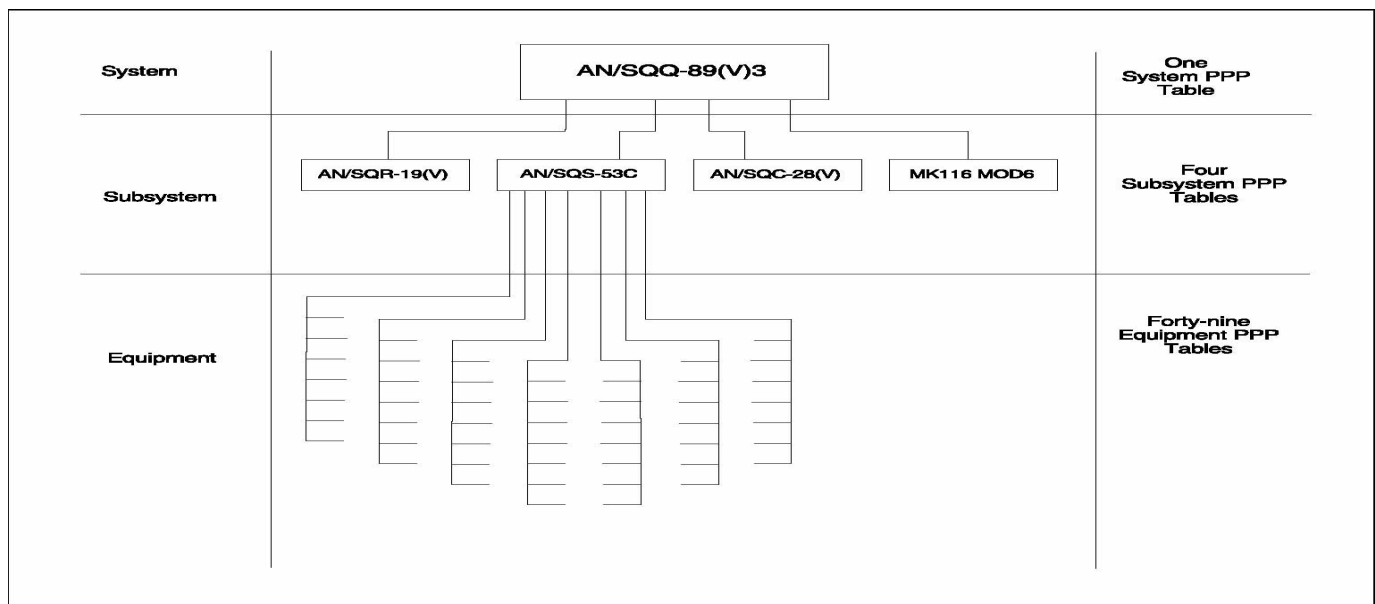
FIGURE 3-2: THE AN/SQQ-89(V)3 AS THE SYSTEM

FIGURE 3-2 shows the AN/SQQ-89(V)3 ASW COMBAT "SYSTEM" as being the System

3-7

- AN/SQQ-89(V)3-related <u>Subsystems</u> are now the AN/SQR-19(V), AN/SQS-53C,AN/SQC-28(V), and MK 116 MOD 6 UFCS
- AN/SQS-53C-related <u>Equipments</u> are the 49 cabinets mentioned above: AN/UYQ-21, UYK-44, XMITTER CONTROL, XMITTER DRIVE CONTROL, etc.

NOTE

Each of these "equipments" is comprised of multiple devices, e.g., the *AN/SQS-53C SONAR* consists of seven Functional Groupings (power distribution, xmitter, display, etc.) and 49 separate cabinets at various locations throughout the *TICONDEROGA*.

2.6.1. Both figures show correct PPP designations:

- Following the Figure 3-2 approach, only four Equipment PPPs are required: AN/SQR-19(V), AN/SQS-53C, AN/SQC-28(V), and MK 116 MOD 6 UFCS

- Following the Figure 3-2 approach, numerous equipment PPPs are required for each Subsystem: The AN/SQS-53C Subsystem alone requires 49 Equipment PPPs—AN/UYQ-21, UYK-44, XMITTER CONTROL, XMITTER DRIVE CONTROL, etc. (one PPP for each of its 49 separate cabinets).

NOTE

Both approaches can produce equally good curricula.

2.7. Generic PPP tables are preferred for use when:

- The specific equipment type that the graduate will operate/maintain is known, but the exact equipment mark/mod is unknown:

  - Generic Hardware PPPs are always Equipment
  - These PPPs are most often used in developing "A" School training

NOTE

Graduate will operate an IBM-compatible microcomputer, **BUT**, the specific make, model or series could be any IBM-compatible microcomputer on the market (IBM, Zenith, Compaq, Zeos, etc).

2.8. Non-Hardware PPPs Defined:

- TASK/FUNCTION – may be defined as: The knowledge and skills required to perform work **NOT** directly related to any specific system, subsystem, or equipment.

NOTE

Task/Function PPPs list the knowledge and skills required to perform a Task or Function.

- BACKGROUND — these PPPs describe:

  - The prerequisite knowledge and skills required for learning operation and maintenance of a System, Subsystem, Equipment, or performance of a Task or Function

NOTE

These PPPs list those things a person must **FIRST** know, and is able to do; **Hence, "PREREQUISITE"** in order to learn to operate and maintain a particular System, Subsystem, or Equipment or to perform a specified Task or Function.

  - A body of knowledge and skills the trainee must possess before entering the classroom/laboratory to begin learning the Hardware or Task/Function skills.

NOTE

These PPPs are often organized around subject matter areas, such as the following:

Mathematics - Basic Electricity - Basic Electronics

2.9. Non-Hardware PPP Discussion—Task/Function:

- A Task/Function is not unique to the operation and maintenance of any one particular system, subsystem, or equipment
- To perform a given Task/Function, e.g., instructing, requires many different skills and knowledge; all leading to a single application
- A Task/Function usually has one of the following endings – ING, ION, MENT:

- Cooking (NOT Cooker)
- Navigation (NOT Navigator)
- Training Management (NOT Training Manager)

NOTE

A TASK/FUNCTION PPP WILL ALWAYS DESCRIBE

A **Job** - Cook (Mess Management Specialist)

or

A **Billet** - Navy Instructor

or

A **Function** - Trainee Counseling

or

A **Task** - Conduct a counseling session

or

A **Non-word** - almost always expresses a Job and never an adjective, i.e., ing, ending

- See Figure 3-3 for an illustration

TASK/FUNCTION

Instruction
Lesson Topic Development
Trainee Evaluation
Trainee Counseling
Instructor Evaluation

Computerized Support for Training
Curriculum Maintenance
Trainee Remediation
Academic Review Board
Administrative Duties
Security and Safety

Application:
Navy Instructor
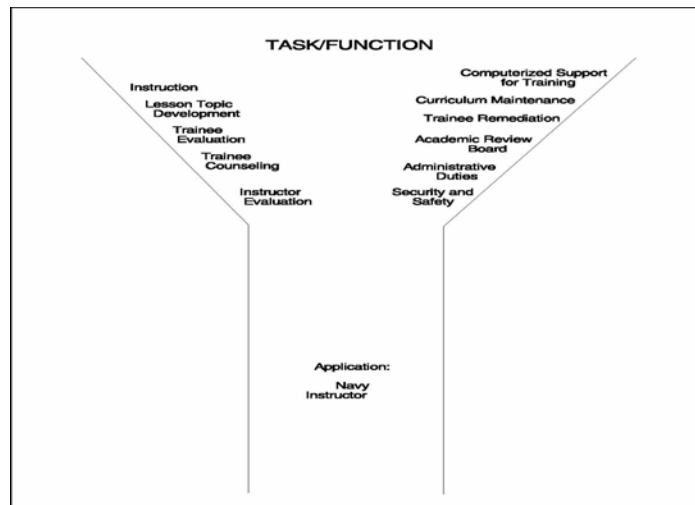
**Figure 3-3: SKILLS AND KNOWLEDGE REQUIRED FOR THE
TASK/FUNCTION "NAVY INSTRUCTOR"**

2.10. Non-Hardware PPP Discussion—Background (BG):

- BG skills and knowledge describe prerequisite requirements
- BG skills and knowledge apply to all, many, or at least more than one, Hardware or Non-Hardware, PPP line items
- BG skills and knowledge are not directly related to any one particular Hardware or Non-Hardware PPP
- Any category of BG skills and knowledge, e.g., mathematics, covers a relatively narrow field of subject matter; but, such BG skills and knowledge, i.e., mathematics, have an almost unlimited range of application and usefulness, as illustrated by Figure 3-4
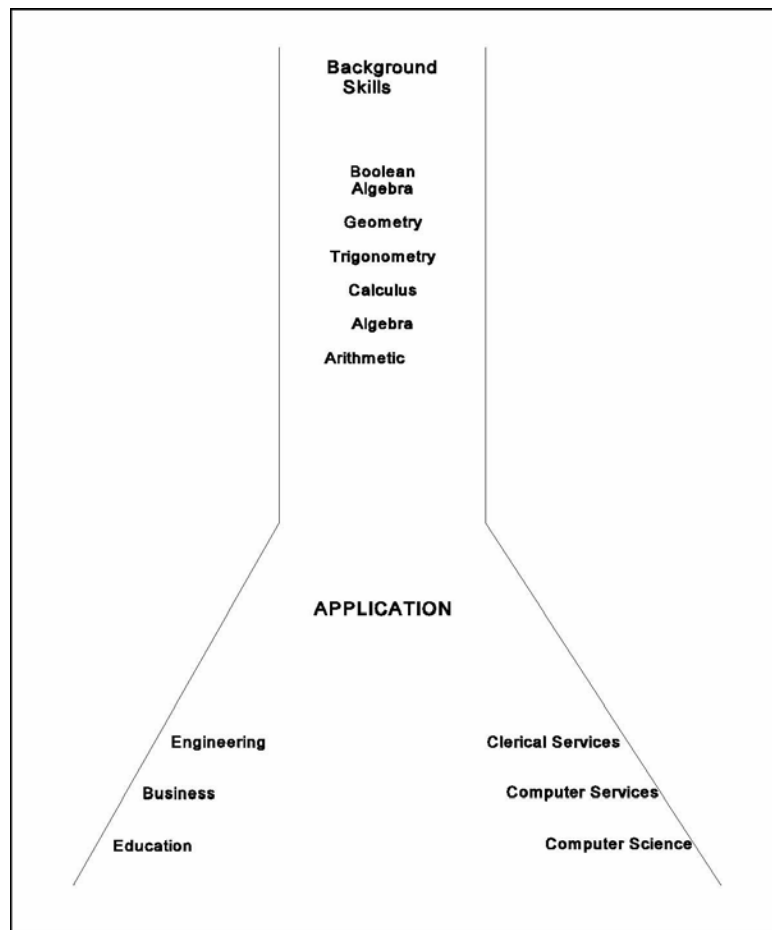
FIGURE 3-4: HOW BACKGROUND SKILLS APPLY TO A VARIETY OF APPLICATIONS

2.11. PPP CHECKPOINT

- You should now know enough about PPPs that you are able to determine the types of PPPs required for your training program and their exact Hardware and/or Non-Hardware titles
- Check your PPP titles against those listed in the *TRAINING REQUIREMENTS DATA BASE ANNUAL REPORT* and associated *QUARTERLY UPDATES*. Obtain copies of those existing PPPs required for your training program

2.11.1. Existing PPPs cannot be duplicated.

- Volume III, Chapter 3, of this manual discusses the report and management of PPPs
- PPPs are developed only if there are no existing tables
- Having determined the types of PPPs required for your training program, compile a PPP Table listing which you will submit to higher authority Curriculum Control Authority (CCA) for review and approval.

SECTION 3 - PPP DEVELOPMENT

3.1. RULES FOR WRITING PPPs

- PPPs are developed from a comprehensive task analysis. A PPP is a minimum listing of required skill and supporting knowledge
- PPPs are written in generally specific terms
- PPPs do not repeat what is in the technical documentation
- Sometimes PPPs must be a comprehensive task listing
- A PPP is not personnel-specific
- A PPP is not course-specific
- Skill PPP items are always identified first
- Each skill has its directly supporting knowledge
- Skills will also have indirectly supporting knowledge
- Skill and knowledge behaviors are job-specific
- All available resources are used in developing PPPs
- Correct order of PPP development:

  - Equipment
  - Subsystem
  - System
  - Task/Function
  - Background

NOTE

Your PPPs will be accurate and complete if you follow the rules listed above. Each rule is individually discussed in the pages that follow.

3.2. PPPs are developed from a comprehensive task analysis

- Use all available resources to gather task analysis data
- This task analysis may be:

  - LSAR (Logistics Support Analysis Record)
  - NOTAP (Navy Occupational Task Analysis Program, i.e., its Occupational Standards and Survey Task Analysis documents)
  - OTHER (Job Task Analysis/Technical Manuals/Other Reference Sources, etc.)

- The above are all comprehensive task analysis-based documents, from which required information can be extracted and used to develop a PPP Table
- Task analysis may be done by using Model Statements and Curriculum Developer Aids (CDA) for PPP table development

  - The Model Statements consist of fill-in-the blank skill and knowledge statements
  - The CDA works in conjunction with the Model Statements and leads you through the task analysis process by helping you select the correct Model Statements. The CDA is used for your hardware PPP tables only
  - Use of the CDA (Hardware PPPs only) and model statements ensures your PPP Table will be developed following ALL the important rules that are discussed in this chapter

NOTE

A technically correct, comprehensive PPP is best developed by using these Model Statements/CDAs and the appropriate task analysis-based documentation.

3.3. PPPs are minimum lists of skills and supporting knowledge

- A minimum of statements (and space) are required to describe a maximum amount of information

- A PPP reduces, or minimizes, a long list of duties/tasks contained in a comprehensive task analysis to a workable number of several, or more, all-inclusive statements; i.e., *A minimum requirements list* is prepared

3.4. PPP statements are generally specific

- The statement "perform preventive maintenance (PM) on the"

  - In-Service Training "general" because it encompasses ALL PM tasks
  - In-Service Training "specific" when the exact Hardware name is written in
  - In-Service Training also "specific" because task elements are usually listed

- PPP tables are constructed using general terms to support specific skills

3.5. Technical documentation is not repeated in PPPs. All operation and maintenance tasks are listed and discussed in the hardware's technical manual(s), then these same tasks are not restated in the PPP. Anyone needing this information should go ALWAYS to the technical documentation.

3.6. PPPs must be comprehensive task lists when the technical manual(s) for the hardware is either non-existent, or inadequate. This is because the PPP is now the only source of this information.

NOTE

The PPP developer is responsible for getting this information into the hands of those writing/maintaining the technical documentation.

3.7. PPPs are written like this because:

- They can remain static, even though the Hardware changes
- It will ensure that the PPP will be an easy-to-work-with document, and one which is of manageable size
- The figure on the next page illustrates all of the concepts we have discussed thus far
- Comprehensive task analysis — minimum requirements list — generally specific — technical documentation not repeated

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- This figure also shows how a PPP statement can be derived from a comprehensive task analysis
- The following examples and figure 3-5 will be used to explain the rules for writing quality PPPs. See the following page for this explanation

PERSONNEL PERFORMANCE PROFILES
STAGE ONE

COMPREHENSIVE TASK ANALYSIS
(From *Chilton's Truck and Van Repair Manual*)

A. Maintain the CUCV (Type A) Utility (24/36,000 mile intervals) — DUTY

A1. Replace wiper blades
A2. Change fuel filter
A3. Replace spark plug wires
A4. Adjust/replace spark plugs
A5. Change oil
A6. Change oil filter
A7. Check brake fluid level
A8. Change coolant
A9. Replace/adjust belts
— TASKS

The results of a comprehensive Task Analysis

PPP TABLE

General (Encompasses ALL preventive maintenance)

Specific to a particular equipment

2. SKILL   2-2. Perform preventive maintenance on the CUCV (Type A) Utility (DUTY)

Does not repeat technical documentation that can be found in *Chilton's Manual*

a. 24,000 mile intervals
b. 36,000 mile intervals
— TASKS

Minimize List

FIGURE 3-5:   PERSONNEL PERFORMANCE PROFILES

- A PPP is a minimum requirements listing: By the process of minimizing, the nine tasks and one duty identified by comprehensive task analysis have been reduced to one PPP line item and two PPP sub-items

- PPPs are written in generally specific terms:

  - The 2-2 PPP line item is specific because writing in the hardware name, CUCV (Type A) Utility, at the end of the PPP statement means that it applies solely to the CUCV (Type A) Utility
  - This 2-2 PPP line item is also general in nature because it can encompass all preventive maintenance tasks performed at 24/36,000 miles, even if the list expands or contracts

3-15

- PPPs do not repeat what is in the technical documentation: Chilton's has a comprehensive list of 24/36,000-mile preventive maintenance tasks for the CUCV (Type A) Utility—so there is no need to repeat this list in the PPP Table.

- Sometimes PPPs must be a comprehensive task listing:

  - Suppose there were no Chilton's, and no comprehensive list of 24/36,000-mile preventive maintenance tasks — the PPP Table becomes the only source of this information and, consequently, must be a comprehensive task listing.

NOTE

Each PPP skill statement selected for training is later subjected to a comprehensive task analysis. Also, each is expanded into a list of tasks that must be performed in the workplace. These tasks form the basis of course-related Job Sheets, used for learning and practicing skills in the training environment.

  - When the technical documentation is updated, the PPP may be rewritten as minimum requirements listing, as this information is now available where required.

- To protect integrity of already-developed courses:

  - PPPs are modified only per procedures contained in Volume III.
  - The PPP goes away only when the hardware goes away.

3.8. PPPs are not course/personnel-specific:

- Only one PPP is allowed per each hardware, task/function, or background subject area.
- A given PPP serves as the foundation for all training on the subject hardware, task/function or background subject area.
- PPPs are not developed in such a way that they serve only one course.

NOTE

As with all rules, occasions sometimes arise which justify violating the rule. A course specific PPP may be warranted. Two activities may each need their own PPP for the same device.

3.8.1. PPP Usability. The PPP must be usable for training everyone from military recruit to commanding officer. The most serious and frequent error occurs because the developer has a specific course in mind for example:

- The developer thinks only of those skills and knowledge required for their course. In making these mistakes the developer:

  - Shortens the list of PPP line items
  - Narrows the scope of the PPP

- This reduces its usability so that it applies only to a single course or skill category

3.9. Skills are always determined first:

- Knowledge is always determined last:

  - After ALL skills have been identified

- ALL knowledge must support a skill(s):

  - Either "directly" or "indirectly"

- Nice-to-know information is not allowed

NOTE

By determining skills first and knowledge last, you ensure that training emphasizes performance of Operating/maintaining hardware and Performing a task or function. Your focus as a developer must always be PERFORMANCE of the skills.

3.10.   Skills require directly supporting knowledge:

1-5. Operational description (KNOWLEDGE)

    DIRECTLY SUPPORTS

2-1. Operation (SKILL)

1-6. Maintenance description (KNOWLEDGE)

      DIRECTLY SUPPORTS

2-2. Maintenance (SKILL)

- Every skill PPP statement must have a related knowledge
  PPP statement(s). Note in the following example item 1-
  5-2 directly supports skill line item 2-1-1 and knowledge
  line item 1-6-2 directly supports line item 2-2-1.

EXAMPLE

```
2.  EQUIPMENT SKILLS

2-1.  OPERATION

2-1-1.  Perform tasks for operation of the _____ including:

        a.  Preoperational procedures

        b.  Operational procedures

        c.  Post-operational procedures

2-2-1.  Use special tools and test equipment required for maintenance
of the _____ as prescribed in applicable documentation.

1.  EQUIPMENT KNOWLEDGE (THAT DIRECTLY SUPPORTS THE SKILLS)

1-5.  OPERATIONAL DESCRIPTION

1-5-2.  Describe tasks to perform operation on the _____:

        a.  Preoperational procedures

        b.  Operational procedures

        c.  Post-operational procedures

1-6-2.  Describe the use of special tools and test equipment required
for maintenance of the _____ as prescribed in applicable
```

3.11. Indirectly supporting knowledge is needed also:

- This is knowledge that may not be traced back to a
  specific skill PPP line item
- This knowledge is required for skill understanding—but it
  is not required for skill performance
- This knowledge allows one to better understand HOW the
  hardware is operated   and maintained

- Even though this knowledge does not contain actual operation and maintenance procedures
- It is possible, therefore, to learn to operate and maintain the hardware, even though one has not acquired the body of indirectly supporting knowledge

EXAMPLE

```
1.   KNOWLEDGE (THAT INDIRECTLY SUPPORTS)

     General Description of _____
     Physical Description of _____
     Functional Description of _____
     Interface Description of _____
     Documentation Description _____

2.   SKILL (HARDWARE USE)

     Operation
     Maintenance
```

3.12. Job-specific behaviors are used to develop PPP line items:

- Choose a word that exactly describes the skill: Operate — Maintain — Troubleshoot — Repair — Analyze

- Choose a word which describes precisely how the knowledge will be used on the job: Explain — State — Describe — Locate — Define

SECTION 4 - DEVELOP YOUR HARDWARE PPPs

4.1. Some things are common to all hardware PPPs:

- "1" is associated with Knowledge
- "2" is associated with Skills
- Hardware PPPs have three categories of skill:

  - "2-1" OPERATION
  - "2-2" MAINTENANCE
  - "2-3" ASSEMBLY (On board only - seldom seen in a PPP)

- Hardware PPPs have seven categories of knowledge:

  - General Description

- Physical Description
- Functional Description
- Interface Description
- Operational Description
- Maintenance Description
- Documentation Description

NOTE

See *Volume III Appendix D* for a description of the contents of each of the seven knowledge categories.

- Technical manuals are often organized this same way.

NOTE

The above sequence is also the best for teaching Hardware-related information because the trainee progresses:

    Simple – complex
    General – specific
    Easy-to-do - more-difficult-to-do

However, 1-7 is usually taught very early in the course, even though listed last.

- Hardware PPP Line items are sequential, as shown in the example below. Note that three (3) sub-item levels are allowed, where 1-6-1 is the first level: a. [1st level] - (1) [2nd level] - (a) [3rd level]

ITEM NO.	KNOWLEDGE/SKILLS
1-6	1. Maintenance Description
1-6-1	2. Define the Maintenance policy for _____ <- PPP Line Item a. Preventive Maintenance <- - - - - Sublevel 1 (1) Servicing <- - - - - - - - - -Sublevel 2 (2) Operational Check (a) Pre-maintenance Procedure <- - Sublevel 3 (b) Performance Checks

3-20

- Volume III Appendix D contains the following helps for developing Hardware PPPs:

  - Hardware PPP Model Statements designed so that fill-in-the blanks produce completed PPP line items.
  - Hardware PPP CDAs (Curriculum Developer Aids) help you to select the applicable Model statements used to complete your PPP table.
  - PPP Table Checklists help to analyze the Hardware so that you can determine content of the PPP (if used, these are not submitted for review).

SECTION 5 - DEVELOP YOUR TASK/FUNCTION PPPs

5.1. Some things are common to all Task/Function PPPs:

- "1" is associated with Knowledge
- "1-X" indicates a major subject area supporting a "2-X" Duty
- "1-X-X" indicates a knowledge supporting a major subject area

Item No.	Knowledge/Skills
1-1	Basic Driving <- - - - - - - - -- - - - - Subject
1-1-1	Describe the Rules of the Road <- - - - - -PPP Line Item
	a. Traffic signs and signals < - - -Sublevel 1
	(1) Shape <- - - - - - - - - - -Sublevel 2
	(a) Octagon <- - - - - - - Sublevel 3

- "2" is associated with Skills
- "2-X" indicates a Duty
- "2-X-X" indicates a Task supporting the Duty: i.e., The PPP Line item

Item No.	Knowledge/Skills
2-1	Perform Basic Driving Duty
2-1-1	Observe Rules of the Road PPP line item
	a. Observe traffic signals and signs Sublevel 1
	(1) Perform action required by Sublevel 2 traffic signs
	(a) Stop upon recognition Sublevel 3 of octagon shape

- Each Duty or Task (or group thereof) must have directly supporting knowledge:

  - Duties must be traceable to their directly supporting knowledge by their numbers.
  - It is desirable for tasks to be traceable to their directly supporting knowledge; however, this is not a requirement.

- Indirectly supporting knowledge is used as needed
- Numbers/letters are used with the two-digit numbers:

  - To indicate sequence of PPP line items
  - To list sub-items of a line item

- Three sub item levels are allowed

NOTE

Task/Function PPPs are developed using standard task analysis procedures, which are not discussed in the manual. The Navy's reference document for Task Analysis information is NAVEDTRA 130B: *Task Based Curriculum Development Manual*.

- It may not be necessary for you to go to the 3rd (or even 2nd) level of sub-items shown in the example on previous page. The only requirement is that:

  - Skills must be identified by the number "2"
  - Knowledge must be identified by the number "1"

SECTION 6 - DEVELOP YOUR BACKGROUND PPPs

6.1. Some things are common to all Background PPPs:

- "1" is associated with Knowledge
- "1-X" indicates a Major Subject Area supporting a "2-X" Area or Duty
- "1-X-X" indicates Knowledge supporting a Major Subject Area

Item No.	Knowledge/Skills
1	Knowledge <- - - - - - - - - - - - - - - - Category
1-1	Explain how greases are classified <- - -PPP Line Item
	a. Composition <- - - - - - - - - Sublevel 1
	(1) Silicone grease <- - - - - Sublevel 2
	(2) Viscosity <- - - - - - - - Sublevel 3

- "2" is associated with Skills
- "2-X" indicates a Major Subject Area or Duty
- "2-X-X" indicates a major Component Subject Area or Task

Item No.	Knowledge/Skills
1	Skill <- - - - - - - - - - - - - - - - - Category
1-1	Select the grease required for Vehicle Application < - - - - - - - - - - - -PPP Line Item
	a. Bearings <- - - - - - - - - - - -Sublevel 1
	(1) Roller <- - - - - - - - - - -Sublevel 2
	(a) Catcher <- - - - - - - -Sublevel 3

- Each Major Subject Area/Component or Duty/Task (or group thereof) requires directly supporting knowledge:

  - Duties/Areas should be traceable to their directly supporting knowledge by their numbers.
  - It is desirable for tasks/components to be traceable; however this is not a requirement.

- Indirectly supporting knowledge is used as needed
- Numbers/letters are used with two-digit numbers:

  - To indicate sequence of PPP line items
  - To list sub-items of a line item

- Three sub-item levels are allowed

6.1.1. Background PPPs are often developed using standard task analysis procedures, which are not discussed in this manual. The Navy's reference document for Task Analysis information is NAVEDTRA 130B: Task Based Curriculum Development Manual.

- One approach to creating a Background PPP table is to begin by organizing your Background PPP table according to duties (skills) or major subject areas (knowledge)
- Another method of organizing your Background PPP table may work equally well for you the only requirement is that:

  - Skills must begin with the number "2"
  - Knowledge must begin with the number "1"

6.2. Task/Functions – Background PPP Special Considerations:

- Write each PPP line item so that it remains a logical expression when any one of the skill descriptors is added to the line item, as shown below:

1-1-1. Describe the function and location of the normal and a auxiliary indications on the Ships Control Panel (SCP)....

1-1-4. State the purpose of the SCP switches, knobs, and valves to include....

1-2-3. Describe the following effects, conditions, and limitations that pertain to the rudder during surface and submerged operation....

2-1-1. Demonstrate proper use of normal and auxiliary indications on the SCP to include the following....

2-1-2. Respond to the failure of normal and/or auxiliary indications to include....

2-2-3. Operate the rudder for course keeping in surfaced and submerged operation under the following effects....

6.3. There are several ways of developing PPPs:

- You can "be creative" – using only the sample PPPs in Volume II for guidance
- Or, you can use the PPP Model Statements

6.4. Another equally viable approach begins by organizing your Background PPP table according to duties (skills) or major subject areas (knowledge) - see the Task/Function PPP table example:

- You may use the PPP CDA appropriate to your Hardware PPP type(s)
- Or, you can use a combination of the above

6.5. Recommended Approaches. If you're inexperienced or uncertain, to develop any Hardware PPP:

- Refer to the sample PPP for your PPP type found in Volume II, Tab A-2
- Use the "Hardware PPP CDAs," and the "Hardware PPP Model Statements"

NOTE

The CDA in conjunction with the Model Statements will lead you step-by-step through the process of identifying all knowledge and skill items required to complete your PPP table.

- Then use the appropriate PPP Table Checklist to ensure the content of your PPP is complete
- To develop any Task/Function PPP:

  - Refer to the sample Task/Function PPP in Volume II, Tab A-2
  - Use the "Task/Function Model Statements and PPP Checklist" to ensure content of your PPP is complete

- To develop any Background PPP:

  - Refer to the sample Background PPP found in Volume II, Tab A-2
  - Use the Background PPP Model Statements and appropriate PPP Table Checklist

- If you're experienced and/or confident, to develop any Hardware PPP: Use the "Hardware PPP Model Statements" and appropriate "PPP Table Checklist".

NOTE

While the Model Statements can be used alone, using the Checklist also will assure you of the accuracy of your PPP.

- To develop any Task/Function PPP: Use the "Task/Function PPP Model Statements," or "be creative," whichever is easiest for you.

- To develop any Background PPP: Use the "Background PPP Model Statements," or "be creative," whichever is easiest for you.

SECTION 7 - WHAT IS NEXT?

7.1. You will develop the *Training Path System* (TPS):

- You will determine whether to train someone to:

  - PERFORM Hardware or Non-Hardware skills
  - DIRECT those who are the performers
  - COORDINATE the overall actions of those who direct or perform

- You will determine if the trainee:

  - Will operate and/or maintain hardware, or,
  - Perform a Task/Function, and for both,
  - The ability level, which must be attained

- You will determine, first, the skills and knowledge the trainees will acquire by choosing specific line items from the PPPs. Then you will join these PPP line items with the designated ability level(s), thus specifying the precise skills and knowledge to be acquired.

- You will determine a training pipeline of courses, and

  - Where your course(s) fits in this pipeline
  - Where your course(s) will be taught

- You will begin Job Sheet development:

  - This process begins as soon as the TPS is done
  - This is done to make sure that skills drive, or force, content of the curriculum

- You will prepare a PPP Table Listing:

  - This document lists all PPP Tables required for development of your training program.
  - PPP Tables will be listed hierarchically, beginning with that PPP of highest order, (e.g., system is superior to subsystem) followed by titles of corresponding subordinate PPP Tables.
  - Task/Function PPPs will be listed where they best fit in relation to the Hardware PPPs.
  - Functionally related equipment will be grouped to the maximum extent possible.
  - Background PPPs will be listed, alphabetically, last of all.

- PPP Table titles will reflect the exact Hardware/Non-Hardware for which the Table is being provided – MK and MOD numbers will be included, if applicable.

- The suffix "(M)" or "(R)" will be placed following the PPP Table Number of Tables to be revised/modified:

  - Volume III of this Manual discusses revisions and modifications to existing PPP Tables.

STAGE ONE

CHAPTER 4

TRAINING PATH SYSTEM

INTRODUCTION

In the previous chapter, Personnel Performance Profiles (PPPs) were created or selected which identified the skills and knowledge required to operate and maintain a system, subsystem, or equipment, or perform a task/function.

Development of the Training Path System (TPS) completes **Stage One**. Building upon the previously developed PPPs, you will make a series of decisions fundamental to the later development of training materials.

Though the procedures for developing a TPS are presented in a certain sequence, this is not necessarily the sequence in which the elements of the TPS must be developed and, in fact, the various elements can be developed in almost any sequence.

SCOPE

- To help make some very important training decisions, using the basic information contained in PPP Tables.
- Decisions that determine:

  - WHO will be trained
  - WHAT will be trained
  - WHERE will training be provided

- By making these decisions the eventual content of the curriculum or what will actually be taught in the classroom and laboratory is determined
- The TPS bridges the gap between PPPs and the curriculum, and provides the information required to develop; Learning Objectives - Lesson Plan - Trainee Guide - Tests
- Upon finishing with the TPS Chapter, all training requirements for the course will be determined
- This is done by making the required decisions which result in development of required TPS documents

SECTION 1 - THE TPS IN-SERVICE TRAINING

- A management tool which designates the training requirements for Navy personnel involved in a particular training program(s).

- A decision-making process where a series of questions fundamental to curriculum development (see following page) are answered and recorded, thus establishing the training requirements of the curriculum.

SECTION 2 - TPS ELEMENTS (OUTPUTS)

2.1. Training Objective Statements (TOS) describe skills and knowledge to be learned by the individual.

2.2. Training Level Assignments (TLAs) list specific PPP line items to be taught, the training environment where each will be taught, and the level of training to be provided to each PPP line item.

2.3. Table Assignment Matrix (TAM) summarizes the training requirements for PPP Tables listed on the Training Path Chart (TPC) (see below) by showing all TOS associated with each PPP.

2.4. Training Path Chart (TPC) graphically shows a complete training path for a category of people by listing courses in the path, and PPP Tables covered by each

SECTION 3 - TPS CHAPTER'S GOALS

To help you determine ALL training requirements for the course by leading you, step-by-step, through the decision-making process.

3.1. TPS decisions:

- WHO will be trained?
- WHAT will the person be trained to do?

  - Operate something?
  - Maintain something?
  - Operate and maintain something?
  - Perform (or direct, or coordinate) a certain task or function?
  - Acquire some skill(s)/knowledge needed for learning any of the above skills?

- WHAT exact skills will the person learn to perform?
- WHAT knowledge is needed to perform these skills?
- WHERE will the training be provided?
- WHAT other courses come before, or after?

NOTE

You should now turn to the Sample TPS in Volume II, TAB A-3, and glance over it before reading the TPS discussion. As you read the following pages, you should refer to appropriate sections of the Sample TPS.

SECTION 4 - WHO WILL BE TRAINED?

All Navy personnel fit into one of three groups. Course scope and content are determined by the group from whom the training is intended. In addition, the kind of work that is to be trained determines the personnel group that is selected.

4.1. The three different groups of personnel:

- Those who COORDINATE the work of others, i.e., the Coordinator
- Those who DIRECT the work of others, i.e., the Director
- Those who PERFORM the hands-on work associated with operation and/or maintenance, or doing the task/function, i.e., the Performer

4.2. The following descriptions will help to identify who will be trained, or that group of personnel for which the training is to be designed:

- Coordinator: who has overall authority and responsibility (i.e., CO/XO, the system manager)
- Director: direct supervisor, i.e., department head, division officer, leading petty officer
- Performer: One who does the hands-on work of operating and/or maintaining the system, subsystem, or equipment, or doing the task/function, i.e., technician/operator?

4.3. Choosing the Personnel Group:

- Enlisted personnel may require training to be a Coordinator/Director—such as when a Chief is assigned as the Craft Master of a Tug.
- Officers may require training to be a performer—for-instance; the Radar Intercept Officer performs operational procedures.
- The Prospective Commanding Officer of a ship when being taught the hands-on pilotage skills requires training as a Performer.

NOTE

Though important, military rank, or whether officer or enlisted DOES NOT determine which personnel group is selected. The personnel group **IS ALWAYS** chosen based on the kind of work to be performed.

SECTION 5 - WHAT WILL THE PERSON BE TRAINED TO DO?

- Deciding what the Sailor will be trained to do and describing what the Sailor will be trained to do is aided by the use of prepared statements such as those shown below.

  - Each skill statement describes a unique form of work

```
Skill statement examples include:

   Coordinate operation and maintenance
   Direct operation, or
   Direct abnormal operations, or
   Direct maintenance, etc.
   Perform normal operations.
   Perform abnormal operations.
   Perform preventive maintenance.
   Perform systematic fault isolation procedures
   Perform undocumented fault isolation procedures
   Perform (Coordinate, Direct) basic skills associated
   with the task/function
   Perform (Coordinate, Direct) advanced skills
   associated with the task/function
```

5.1. These statements are called TOS. Use canned, or prepared, TOS statements to simplify wording and shorten developmental time.

**5.2. TOS are organized into Task Sets*:*

- Task Sets are:

  - Coordinate TASK Set
  - Direct TASK Set
  - Perform TASK Set

- Coordinate TASK Set begins on page 4-16
- Direct TASK Set begins on page 4-19

4-5

- Perform TASK Set begins on page 4-23

  - You may then use each TOS as is, add to it, or amend
    it, to better describe your training program-expanded,
    amendable TOS are in the Volume III, Appendix E.
  - Amending the TOS usually involves writing into each
    TOS selected the name(s) and nomenclature of the
    hardware, or non-hardware, being trained, deleting
    unnecessary phrases from the TOS, and adding
    explanatory phrases as needed.
  - Amending the TOS transforms them from generalized
    statements about skills and knowledge to be trained to
    specialized statements about the planned-for training.

5.3. To describe a training program:

- Select the desired TASK Set
- Next, select the required skill TOS
- Then, select the supporting knowledge TOS

EXAMPLE

HOW TO DESCRIBE A COURSE IN A FEW WORDS

▪ Select the desired TASK Set: For instance, by
  specifying "Perform TASK Set" you are saying that
  your course will train personnel to *be performers*,
  i.e., *perform* certain skills (vice Direct or
  Coordinate skill performance).

▪ Next, select the desired Skill TOS from this TASK
  Set: If you choose: "Perform preventive
  maintenance/Perform systematic fault isolation
  procedures" you are saying your course will train
  sailors to perform preventive/basic corrective
  maintenance.

▪ Then, select the supporting Knowledge TOS: You
  must select "Training provides the knowledge to
  perform preventive maintenance and basic corrective
  maintenance".

▪ Finally, combine this information with a PPP Table
  Title: Such as, *COMMERCIAL UTILITY CARGO VEHICLE
  (TYPE A), UTILITY*—you have now stated your plans to
  develop a course to teach preventive and basic
  corrective maintenance of this one vehicle.

5.4. TOS CODE identifies each individual TOS and each TOS has its own unique TOS Code:

- This TOS CODE is a letter/number identifier placed just to the left of each TOS
- TOS Codes provide a shorthand method of referring to a particular TOS
- TOS Codes are used to relate selected PPP line items to designated training objective statements using a TLA form, exemplified in Volume II Sample Products
- The letter TOS Codes for skill are:

  - TO/(S)—Skill (Background)
  - TO/(J)—Skill (Task/Function)
  - O—Operation
  - P—Preventive Maintenance
  - C—Corrective Maintenance
  - M—Maintenance

- The letter TOS Codes for knowledge are:

  - F—Familiarization
  - T—Theory

- The number TOS Codes for skill and knowledge are: 0/ — 1 — 2 — 3 — 4

5.5. Using TOS Codes define training requirements:

- Recall that PPP line items are written very broadly
- Adding a TOS Code to a PPP Line Item turns a broadly written statement into one that is more specific

---

EFFECT OF THE TOS CODE ON THE PPP

Using the following PPP Line Item as an example: "Perform operation of the CUCV."

This statement can be interpreted several ways — What operational tasks are to be performed: All tasks? Some tasks? Normal tasks? Abnormal tasks?

Combine this PPP Line Item with a TOS code: "Perform operation of the CUCV," **plus** the TOS Code 01.

Now, the PPP Line item, plus the 01 TOS code, specifies normal operation tasks when teaching this PPP Line item.

But, combine this same PPP Line Item with a second TOS CODE: "Perform operation of the CUCV" **plus** TOS codes 01 and 02.

Now, the PPP Line Item, plus the 01 and 02 TOS CODES, specifies normal and casualty operation tasks when teaching this PPP Line Item.

5.6. Thoughts about using TASK Sets/TOS:

- TOS must be read as TASK Sets: You must always know which TASK Set(s) you are currently working with—individual TOS get their meaning from their related TASK Set.

- Each Skill TOS describes a distinct operation or maintenance skill — normal — abnormal — preventive — corrective: And each Skill has a related Knowledge TOS.

- TOS Code numbers do not show sequence or priority— you are not required to teach a "1" TOS before teaching a "2" TOS, or a "2" TOS before teaching a "3" TOS; however, this last situation is highly unlikely:

  - A person can learn casualty operations and not know normal operations.
  - He does not have to know preventive maintenance to perform corrective maintenance.
  - Priority and sequence are determined by the nature of the hardware and the skills.

- TOS Code numbers do not indicate degree of difficulty or complexity in learning and performing the skill: A higher number does not always mean the skill will be harder to learn and perform—a "1" TOS may be more difficult than a "2" or "3" TOS.

- *With/Without Supervision* is intentionally loosely defined:

  - It includes all the various methods to ensure proper performance of assigned tasks
  - All people are under supervision in the sense that each is always accountable for his actions

> Advanced Analysis is the process of using mental evaluation or processes to determine steps that must be performed to obtain a known or desired condition. Undocumented procedures and complex documented procedures require advanced analysis.

- Some courses may require using two, or even three, TASK Sets: The Senior Enlisted Academy course is one example and it utilizes TOS from all three TASK Sets.

> Familiarization has unique purposes:
>
>   - It is teaching trainees the use of the documentation associated with the hardware or task/function.
>   - It is also selected when the intent is to teach trainees to perform "general watchstanding" duties which require no knowledge of how the hardware is operated or maintained

5.7. Select TASK Set/TOS:

- You now know all you need to know to decide which TASK Set, and TOS, to use for your course.
- After selecting the appropriate TASK Set/TOS: You must write the course name at the end of, or into, each Terminal Objective (TO).

5.8. Amending/Revising TOS: Remember, you may add to or modify any TOS, thus describing more clearly the training program that

you intend to develop. By doing this, another developer has a better understanding of what you intended to include in the course.

5.9   USING EXPANDED TOS:

- For each TOS contained in this volume there is a corresponding, Expanded TOS contained in the Volume III, Appendix E:

  - Using the Expanded TOS, the developer can describe in great detail the planned-for training.
  - Expanded TOS are best used to ensure that required subject matter and design considerations are incorporated into the curriculum materials, i.e., Lesson Plan (LP), Trainee Guide (TG) and Instructional Media Materials (IMM).

5.10   TO/TOS Category—IMPORTANT INFORMATION ABOUT THEIR USE:

- The TO/TOS category is used as a means of categorizing the Background and Task/Function TOS into a distinct and easily referenced unit. "TO" is primarily used when conducting formal instruction on the Training Path System (TPS) for curriculum developers.
- TO **SHALL NOT** appear on any of the products of curriculum development, i.e., Training Level Assignment (TLA) charts, Profile Item-to-Objective Assignment Chart (OAC), part page, section page, and so forth.

SECTION 6 - COORDINATE TASK SET T0/B/G (BACKGROUND) AND T/F (TASK/FUNCTION)

6.1.   SKILL/KNOWLEDGE TOS:

- **TO/TOS Category includes**: The background skill and knowledge which is prerequisite to the understanding of the operation and maintenance of the system, subsystem or equipment **AND** the task/function skill and knowledge which is not unique to the operation or maintenance of a particular system/subsystem/equipment:

- **S – B/G Skill:** Completion of training provides the PREREQUISITE (Background), PHYSICAL or MENTAL Skills necessary to support follow-on training in COORDINATING the operation or maintenance of a system/subsystem/or equipment, or further background training.
- **B1 – B/G Knowledge:** Completion of training provides the level of knowledge necessary to recognize or recall ideas, phenomena, symbology, and terminology which are PREREQUISITE to comprehension of a task or function.
- **B2 – B/G Comprehension:** Completion of training provides the comprehension of principles, rules and concepts necessary to solve given problems and situations and performance.
- **J – T/F SKILL:** Completion of training provides the PHYSICAL AND/OR MENTAL skills required coordinating the job or task/function.
- **Q – T/F KNOWLEDGE:** Completion of training provides the knowledge required to *COORDINATE* the job or task/ function.

6.2. E/SS/S FAMILIARIZATION TOS:

- **F1 – Knowledge:** Completion of training provides FAMILIARITY with the:

  - Purpose, operational concepts, location, capabilities, and limitations of a system/subsystem/equipment
  - Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

6.3. E/SS/S OPERATION/MAINTENANCE SKILL TOS:

- **O1 – Skill:** Completion of training provides the ability to coordinate operation and maintenance

6.4. E/SS/S OPERATION/MAINTENANCE KNOWLEDGE TOS:

- **T1 – Knowledge:** Completion of training provides the knowledge to coordinate operation and maintenance: Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment.

Training Objective Statement Matrix
Coordinate Task Set
(CO/XO)

Knowledge			Skill	
Prerequisite	T0		S	Background Skill
B1	B2	Q	J	Task/Function Skill
			B1-Background Knowledge B2-Background Comprehension Q-Task/Function Knowledge	
Familiarity	F1			
Normal Operation	T1		O1	Normal Operation
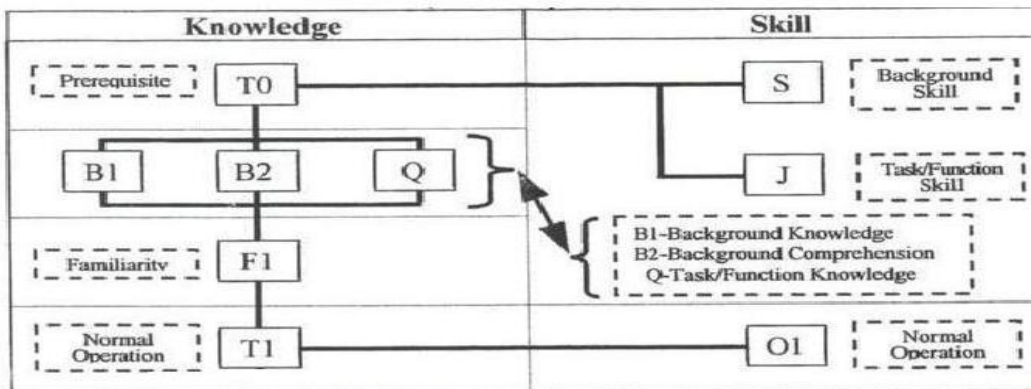
Table 1. Hierarchy – PPP Table Structure

Category	Operation (2-1)		Maintenance (2-2)		Skill
TOS	O1, O2		P1, C1, C2, C3, M1		
Category	Operation Description (1-5)		Maintenance Description (1-6)		Knowledge Direct Skill Support
TOS	T1, T2		T2, T3		
Category	Physical Description (1-2)	Functional Description (1-3)	Interface Description (1-4)		Knowledge Indirect Skill Support
TOS	T1, T2, T3	T1, T2, T3	T1, T2, T3		
Category	General (1-1)		Documentation (1-7)		Knowledge Indirect Skill Support
TOS	F1, T1, T2, T3		F1, T1		
	Task/Function or Background			PPP Tables	
TOS	TO ≥ B1, B2, Q , J, S				

FIGURE 4-1: RELATIONSHIP BETWEEN KNOWLEDGE AND SKILL TOS LEVEL

SECTION 7 - DIRECT TASK SET TO/B/G (BACKGROUND) AND T/F (TASK/FUNCTION)

7.1. SKILL/KNOWLEDGE TOS: TO Includes: The background skill and knowledge which is prerequisite to the understanding of the operation and maintenance of the system, subsystem or equipment **AND** The task/function skill and knowledge *which is not unique* to the operation or maintenance of a particular system/subsystem/equipment:

- **S – B/G Skill:** Completion of training provides the PREREQUISITE (Background), PHYSICAL or MENTAL Skills

necessary to support follow-on training in DIRECTING the operation or maintenance of a system/subsystem/equipment, or further background training.

- **B1 – B/G Knowledge:** Completion of training provides the level of knowledge necessary to recognize or recall ideas, phenomena, symbology, and terminology which are PREREQUISITE to comprehension of a task or function.
- **B2 – B/G Comprehension:** Completion of training provides the comprehension of principles, rules and concepts necessary to solve given problems and situations and performance.
- **J – T/F SKILL:** Completion of training provides the PHYSICAL AND/OR MENTAL Skills required DIRECTING the job or task/function.
- **Q – T/F KNOWLEDGE:** Completion of training provides the knowledge required to DIRECT the job or task/function.

7.2. E/SS/S FAMILIARIZATION TOS:

- **F1 – Knowledge:** Completion of training provides FAMILIARITY with the:

  - Purpose, operational concepts, location, capabilities, and limitations of a system/subsystem/equipment
  - Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

7.3. E/SS/S OPERATION/MAINTENANCE SKILL TOS:

- **O1 – Skill:** Completion of training provides the ability to direct normal operations
- **O2 – Skill:** Completion of training provides the ability to direct:

  - Normal operations requiring advanced analysis (defined on 4-14)
  - Abnormal operations (defined as casualty/degraded/not full mission capable)

- **M1 – Skill:** Completion of training provides the ability to direct maintenance

7.4. E/SS/S OPERATION/MAINTENANCE KNOWLEDGE TOS:

- **T1 – Knowledge:** Completion of training provides the knowledge to direct normal operations: Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment.

- **T2 – Knowledge:** Completion of training provides the knowledge to direct:

  - Normal operations requiring advanced analysis (defined on 4-14)
  - Abnormal operations (defined as casualty/degraded/not full mission capable)
  - Maintenance

SECTION 8 - PERFORM TASK SET TO/BACKGROUND (B/G) AND TASK/FUNCTION (T/F)

8.1. SKILL/KNOWLEDGE TOS:

- **TO/ – Includes:** The background skill and knowledge which is prerequisite to the understanding of the operation and maintenance of the system, subsystem or equipment **AND** The task/function skill and knowledge which is not unique to the operation or maintenance of a particular system/subsystem/equipment:

  - **S – B/G Skill**: Completion of training provides the PREREQUISITE (Background), PHYSICAL or MENTAL Skills necessary to support follow-on training in PERFORMING the operation or maintenance of a system/subsystem/equipment, or further background training.
  - **B1 – B/G Knowledge**: Completion of training provides the level of knowledge necessary to recognize or recall ideas, phenomena, symbology, and terminology which are PREREQUISITE to comprehension of a task or function.
  - **B2 – B/G Comprehension**: Completion of training provides the comprehension of principles, rules and concepts necessary to solve given problems and situations and performance.
  - **J – T/F SKILL**: Completion of training provides the PHYSICAL AND/OR MENTAL Skills required to PERFORM the job or task/function.

4-14

- **Q – T/F KNOWLEDGE**: Completion of training provides the knowledge required to PERFORM the job or task/function.

8.2. E/SS/S FAMILIARIZATION TOS:

- **F1 – Knowledge:** Completion of training provides FAMILIARITY with the:

  - Purpose, operational concepts, location, capabilities and limitations of a system/subsystem/equipment.
  - Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment.

8.3. E/SS/S OPERATION/MAINTENANCE SKILL TOS:

- **O1 – Skill:** Completion of training provides the skill to perform normal operations.
- **O2 – Skill:** Completion of training provides the skill to perform:

  - Normal operations requiring advanced analysis (defined on 4-14)
  - Abnormal operations (defined as casualty/degraded/not full mission capable)

- **P1 – Skill:** Completion of training provides the skill to perform preventive maintenance.

8.4. E/SS/S OPERATION/MAINTENANCE SKILL TOS:

- **C1 – Skill:** Completion of training provides the skill to perform to the authorized maintenance level, systematic fault isolation procedures.
- **C2 – Skill:** Completion of training provides the skill to perform to the authorized maintenance level:

  - Systematic fault isolation procedures that require advanced analysis.
  - Authorized techniques to isolate faults that cannot be isolated using procedures contained in prescribed documentation.

- **C3 – Skill:** Completion of training provides the skill and knowledge to perform, without supervision:

4-15

- Diagnosis of equipment malfunctions, fault isolation, and all repairs.
- This level of skill cannot be trained in the formal school setting. This skill is acquired only through on-the-job experience, and reflects a continuous learning process that is supported by the skills and knowledge taught in the formal school environment.
- The Training Level Assignment Applicability Indicator "1" will always be used to show this skill is acquired via "operational experience," i.e., shipboard performance.

8.5. E/SS/S OPERATION/MAINTENANCE KNOWLEDGE TOS:

- **T1 – Knowledge:** Completion of training provides the knowledge to perform normal operations: Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

- **T2 – Knowledge**: Completion of training provides the knowledge to perform:

  - Normal operations requiring advanced analysis (defined on 4-14)
  - Abnormal operations (defined as casualty/degraded/not full mission capable)
  - Preventive maintenance
  - Basic corrective maintenance

- **T3 – Knowledge:** Completion of training provides the knowledge to perform advanced corrective maintenance

SECTION 9 - WHAT EXACT SKILLS WILL BE TRAINED?

> See Volume II, TAB A-3, TRAINING LEVEL ASSIGNMENT (TLA), as you read the following discussion.

9.1. These skills are taken from the PPP Table(s): First, select a PPP Table for the course, next, select PPP line items from this Table, then, write their numbers on a TLA Form, last, make entries in the correct TOS code column(s).

9.2. To develop the list of skills to be trained:

- Obtain all PPP Tables for your course: PPP Tables are used in this order—Equipment ~ Subsystem ~ System ~ Task/Function ~ Background.
- Select a PPP Table and obtain or prepare a blank TLA Form.
- Write in at the top of the form:

  - The titles of the TPS and PPP Table
  - TPS alpha-numeric identifier may be a Course Identification Number (CIN) or Navy Enlisted Code (NEC) identifier

> TLAs are usually course specific; however, TLAs may also show training for an entire NEC or pipeline—hence the reason for the Training Locator Indicator Codes.

9.3.   Develop the list of skills to be trained:

- "2-1. Operation" skills are done first
- "2-2. Maintenance" skills are done last
- Under the "Item" column of the TLA:

  - Write the number of each PPP line item that must be trained in the course.
  - List the letter/number code of EACH PPP sub-item that you want trained.
  - A missing letter/number code indicates the PPP line item, or sub-item(s) will not be trained.

- Indicate TOS applicable to each PPP line item/sub-item:

  - Write in the Training Level Assignment Applicability Indicators—refer to page 4-25 of this chapter for these.
  - Do this using the appropriate TOS Column(s) — you must use those TOS Codes which correspond with the TOS you selected for your course in an earlier step.
  - Each PPP line item/sub-item must have a Training Locator Indicator Code written beside it.

- If two or more TOS apply to a PPP Line Item/Sub-item:

  - An entry will be made in each applicable TOS column using the appropriate Training Level Assignment Applicability Indicators.

SECTION 10 - WHAT KNOWLEDGE WILL BE TRAINED?

10.1. Develop the list of knowledge to be trained:

- This is done exactly as you did in determining the skills to be trained in the course, except:

  - Note that several categories of knowledge are required to adequately perform the skills.
  - There is, of course, that knowledge which describes HOW to perform the skill—this is "directly supporting" knowledge.
  - Other knowledge describes purpose, equipment interface, general, physical and functional description, etc., associated with performing the skill—this is "indirectly supporting" knowledge.

    > To refresh your memory as to the terms "Directly Supporting/Indirectly Supporting" refers to the PPP Chapter.

  - You must be sure to select those PPP line items, which describe ALL the different knowledge that is necessary too adequately and safely perform the skills you have decided to train.

- First select all directly supporting knowledge PPP line items: "1-5. Operational Description" and "1-6. Maintenance Description"
- Next, select the "Indirectly Supporting" knowledge PPP line items, beginning with "1-1. General" and ending with "1-7. Documentation Description":

  - In most cases you will select all indirectly supporting knowledge PPP line items—the exception being when a PPP knowledge line item does not apply.

  - For instance, some hardware is totally stand-alone and has no "interface" with any other hardware—thus, interface description would not be taught in the course.

10.2. Do the Non-Hardware PPPs: When all Hardware PPP Tables have been analyzed it is time to do the Non-Hardware PPP Table(s):

- Remember, Task/Function PPPs are done first and any Background PPP Tables are done last.
- Just as you did with the Hardware PPPs, list by their 2-X numbers all the skills that must be trained in the course.
- When all skills have been selected, list by their 1-X numbers all knowledge that must be trained in the course, being sure to identify all directly supporting knowledge first.

Placing a Training Level Assignment Applicability Indicator beside each PPP line item selected for training, in the appropriate TOS Column(s):

- Directs where training will be conducted.
- Indicates nature of work to be performed with respect to the PPP line item, i.e., normal ~ abnormal (operations) ~ preventive basic corrective ~ undocumented corrective (maintenance) procedures ~ basic ~ advanced performance of (job/function) skills.
- Determines the skills that the trainee must learn by attending the course.
- Completed/approved TLAs are directive in nature and prescribe the content of the course.

10.3. What Training Level Assignment Applicability Indicators Do: "Xs" may be used instead of Training Level Assignment (TLA) Applicability Indicators:

- You may want to use Xs when the TLA(s) being developed are for an individual course — vice a training pipeline of courses.
- X's may also be used as a placeholder until the correct Training Level Assignment Applicability Indicators are known.

10.4. It is time for an accuracy check:

- The Skill TOS Columns used in each TLA must agree with the Skill TOS you selected earlier.
- TOS Columns for Operation (O1, O2) can only be used with "2-1. Operation" PPP line items.
- Likewise, TLA TOS Columns P1, C1, C2, C3 apply only to the "2-2. Maintenance" PPP line items: Reading all "2-2" line items closely will reveal additional subtleties

which will affect the TLA TOS Column chosen—some describe preventive maintenance only, others corrective maintenance only.

- Recall that TOS Column T1 is used only with normal operation "1-5" PPP line items; Column T2 can be used with abnormal operation "1-5" and all "1-6" PPP line items; TOS Column T3 applies only to "1-6" corrective maintenance PPP line items.

10.5. Thoughts about TLA development:

- Always remember to prepare a separate TLA for each PPP Table used in the course, or listed on the Training Path Chart (TPC), if appropriate.
- As a TLA developer you must be knowledgeable about the people and the Hardware (or Non-Hardware) for which the TLA is being developed:

    - In order to accurately select PPP line items for training you must understand:

        - What do the individuals currently know?
        - What skills will be performed on the job?
        - What training comes afterward?

- A knowledge of how one TOS relates to another is essential. Do not specify T2 if teaching O1 only, or T3 if O2, or P1, or C1, etc., skills are indicated.

10.6. Develop the Table Assignment Matrix (TAM). The TAM is developed in conjunction with the TLA:

- The TAM lists, sequentially, all PPP Tables taught in the course (or NEC) and the TOS applicable to each PPP.

NOTE

TAM readability and comprehension may be enhanced by listing sequentially all Hardware PPP Table Numbers first, followed by those for T/F and B/G (Non-Hardware) training.

- TOS are designated by an "X" in the appropriate block. Like the TLA, the TAM represents a training requirement when filled out

SECTION 11 - WHERE WILL EACH SKILL/KNOWLEDGE BE TRAINED?

11.1. TLA Applicability Indicators Show where training occurs:

- **R -** Replacement Training course
- **A -** Advanced Training course
- **B -** Both Replacement and Advanced Training courses
- **0 -** Training hardware does not exist at the appropriate facility and operational constraints preclude on board training

1. Operational experience is the only means to accomplish the specified training level.

2. Training hardware does not exist to accomplish training at the appropriate facility and onboard training is permitted.

3. Training hardware exists to accomplish training at a facility; on board training is permitted; and training is accomplished on board.

4. Training is received by the individual outside of the cognizant Training Program.

5. Background training is received by the individual as a part of the Navy training program.

NOTE

When required, other TLA Applicability Indicators may be devised if none of the above fit the training situation.

SECTION 12 - THE MEANING OF LETTERS AND NUMERALS:

- As discussed in the preceding section, these codes are essential to TLA development: When entered onto a TLA, TLA Applicability Indicators prescribe where each PPP line item will be trained.

- Letters and numbers show who has accepted responsibility for training the PPP Line Item:

- A Letter TLA Applicability Indicator, i.e., R, A, or B, besides the PPP Line Item, indicates the TRACOM will train to that line item(s).
- A Numeral TLA Applicability Indicator, i.e., 0, 1, 2, 3, 4, or 5 shows that an organization other than the TRACOM, probably an operational unit, will train that PPP Line Item.
- Or, that due to operational constraints, i.e., TLA Applicability Indicator 0, the training requirement is not trained.
- The Numeral TLA Applicability Indicator 5 is ambivalent in that the sailor may receive training for the PPP Line Item by either a TRACOM activity or operational unit.

SECTION 13 - WHAT WILL BE TRAINED, AND WHERE?

13.1. Develop TLAs/TAM: You now have all information needed to develop the TLAs for your training program.

- TLA development is one of the most critical aspects of course development—its importance cannot be over emphasized: This is where you first decide what skills and knowledge the graduates of your course will have when they competed the course

- Use the completed TLAs to develop the TAM: When you have completed this phase of development, you will have a set of filled-in TLAs equal to the number of PPPs you have chose/developed to support your course: You will also have one filled-in TAM.

SECTION 14 - WHAT COURSES COME BEFORE OR AFTER?

14.1. Most courses are part of a "Training Path":

- There are basic, prerequisite courses that must be taken before enrolling in the present course:

  - Many courses provide the person with the technical knowledge and skills necessary to prepare for their first shipboard duty.
  - Other courses provide advanced, follow-on training once the present course has been completed.
  - Still other courses provide shipboard training.

- A training path may be very brief consisting of only a few courses.
- A training path may be a lengthy one comprising all courses a person may take during a Naval career while in a particular rating.

14.2. What is a TPC?

NOTE

See Volume II, TAB A-3, Training Path Chart (TPC), as you read the following discussion.

- The TPC is used to show the training path:

  - By looking at the TPC you can readily see where your course fits in relation to all other courses in the pipeline.
  - The TPC also shows the courses according to whether they provide basic, entry level training, advanced training, etc.

14.3. The following definitions apply to developing TPCs:

- Background Training: "Prerequisite" training that provides basic technical knowledge and skills required to prepare for further specialized training, or a first assignment.
- Replacement Training:

  - Prepares new personnel for their first assignment
  - Formal school training to provide people with the minimum required operational and maintenance qualifications on assigned equipment, subsystems, and the system

- Conversion Training - Training given to previously trained and experienced personnel to enable them to operate and maintain a new/modified system/subsystem/equipment. The training will be sufficient to allow the person to assume new duties at a level, which normally involves replacement training.
- Advanced Training - Training, which follows replacement/ conversion training. Advanced training normally completes the TOS coverage of particular Hardware/Non-

Hardware knowledge and skills requiring advanced analysis
(defined on 4-14) or undocumented fault isolation.

- Onboard Training - Training provided aboard ship, and
which may include individual operator/maintenance
technical training, individual watch station
qualifications, watch team training, and training in
general military subjects.

14.4. Creating a TPC:

- A TPC results from the combination of:

  - PPP Table Index
  - TAM — discussed previously
  - Table Assignment Chart (TAC) - Optional

NOTE

A TAC, which is a graphical display of all related courses in
a pipeline, including course titles and associated PPP Tables,
is frequently prepared in response to a forthcoming Fleet
examination of the course(s).

- The PPP Table Index lists the titles of the PPPs and
beside each the PPP Table Number assigned to that PPP
Table Title: The PPP Table Index is usually placed on a
separate page, especially when the list is extensive.

SECTION 15 - DOCUMENT SUMMARY

15.1. When all TPS elements have been developed:

- The various documents are assembled in this order:

  - TOSs
  - Training Level Assignment(s)
  - TAM
  - TPC

- The pages numbered sequentially beginning with the first
TOS page, and the completed TPS is now ready for
submission.

See Volume II, TAB A-3, for an example of a completed
and assembled Training Path System (TPS).

15.2. TPS development for single course(s): For such courses, the following TPS elements are required:

- TOS
- TLAs
- PPP Table Index

SECTION 16 - WHAT IS NEXT?

16.1. Your course will begin to take shape as you decide how best to organize the subject matter and the specific goals you want the trainees to achieve:

- Using everything you have developed so far, you will:

  - Prepare the Course Learning Objectives
  - Devise an outline for the course, and display this as parts, sections, and topics, thus reflecting course structure and sequence
  - Develop the Topic Learning Objectives
  - Prepare a profile item-to-topic objective assignment chart which enables each PPP line item to be tracked throughout the curriculum

16.2. Develop Job Sheets: Even though developing Job Sheets is actually part of TG development, you should begin thinking about their development as soon as possible, after the TOS and TLAs are done:

- Job Sheets are one of the most critical of all the curriculum elements.
- They are based on the critical skills the trainees will be expected to do upon graduation.
- And, thus, determine what the person will be able to do at his follow-on duty station.
- For all of these reasons, you should allow yourself ample time for preparing Job Sheets.

> See Chapter 7, "Trainee Guide," for a complete discussion of Job Sheet development.

STAGE TWO

CHAPTER 5

TRAINING COURSE CONTROL DOCUMENT

INTRODUCTION

Stage One was initiated in the previous chapter with the creation of a Training Path System (TPS) where fundamental training decisions were made, such as "who will be trained," "what will the Sailor be trained to do," "where will the training be provided," etc. With completion of the TPS, you are ready to begin the next part of the Design Process.

The Training Course Control Documents (TCCD) aspect of Stage Two focuses on stating in specific terms what the trainees must know and be able to do, and determining the form and structure of the course. The Curriculum Outline of Instruction (COI) is the document used to accomplish these goals.

Stage Two concludes by compiling documents of the COI with other documents, such as course and trainee data, resources, and course scheduling information, to create the TCCD. The TCCD serves as the primary management document for the training program.

Development of Course Learning Objectives (CLOs) is the first step of Stage two. Building from everything that has been done so far, the broad, job-related skills and knowledge are determined. From there, you will proceed through a series of steps, and related document development, which enable you too more specifically define the organization of the course and its content.

Though most of the documents submitted for review and approval are laid out vertically ("portrait" format), each may be formatted (with Curriculum Control Authority (CCA) approval) so that it can be transposed directly to the Lesson Plan (LP), with no additional work being required on it. In most cases, this means laying out the document horizontally ("landscape" format).

SCOPE

- To lay out content requirements and format conventions of documents comprising the course of instruction (COI)/TCCD

> Within Navy technical training there is a need to apply the rules of common sense when COI/TCCD/LP/Training Guide (TG) documents are formatted.

- Regarding format, to show that COI/TCCD documents may be formatted like one of the samples in Volume II, or like the corresponding document from the LP.
- To describe the elements of the COI/TCCD.
- To explain the step-by-step process for developing elements of the COI/TCCD.
- To discuss the need for arranging and sequencing the COI/TCCD into parts," "sections," and "topics" to best enhance learning: This is an aspect of COI development which should receive maximum attention.

SECTION 1 - TCCD IN-SERVICE TRAINING

- The primary management tool of higher authority to approve course scope and outline, and both overall and specific objectives of the course, including resources and the personnel for which the course is being designed to train.
- Your determination as to how all of the different components that make up the course, the COI, should be organized and sequenced so that learning is most effective and efficient.

1.1. Function of TCCD and COI:

- Preparing the COI is a process that directly affects "teach ability" of the course. Most of this chapter will concentrate on developing the COI.
- Preparing the TCCD is the assembling of documents that have been developed to fulfill the approval requirement and giving them a cover.
- The last several pages of this chapter will discuss completing the final TCCD.

SECTION 2 - COMPOSITION OF THE PRELIMINARY TCCD

2.1. Preliminary TCCD includes these documents:

- Profile Item-to-Topic Objective Assignment Chart (OAC): Reflects the coverage of Personal Performance Profile (PPP) items within a curriculum.
- Required Resource List (RRL): Lists resources needed to conduct the course.
- COI describes the overall course outline and objectives.

SECTION 3 - COI ELEMENTS ARE

- CLOs

  - CLOs describe the overall knowledge and/or skills to be attained upon completion of a course.
  - CLOs have a behavior, a condition and a standard – of which they written or implied.

- TLOs

  - TLOs support the CLOs and describe the topic-specific skills and knowledge to be attained by the trainee during the topic.
  - TLOs consist of a behavior, a condition, and a standard.

- COI

  - COI presents the course plan, or outline, for achieving the CLOs and TLOs by showing the subject matter that is to be taught and the order of subject matter presentation.
  - COI function is to help you prepare a plan for teaching the subject matter of the course that reflects the principles of learning.

3.1. Completed, this plan COI describes:

- The overall skills and knowledge to be acquired by the trainee upon completion of training.
- The specific skills and knowledge to be acquired by the trainee during each topic.
- The organization of the subject matter into specific units of instruction (Parts, Sections, and Topics), and the sequence, or order, in which this subject matter will be taught.
- The developer's intent with respect to the course, and each unit of instruction as to content, sequence, purpose, and desired outcome.

3.2. The goal of this plan must be to prepare the trainees as completely as possible for the job to which they will be assigned.

SECTION 4 - DOCUMENT COMPILATION

- Preparation of COI elements leads to the development of related documents. The COI is completed when you have prepared all COI elements listed.
- When finished with the COI, compile all your documents in the order they are discussed in the following pages.

4.1. Documents developed. These correspond to the COI Elements listed on the previous page.

> Take a few moments now to study the ***Sample*** *COI* in Volume II, TAB A-4.
>
> While reading the following pages, you will want to refer back to the Sample COI.

NOTE

The COI will be assembled later with other documents to form the *Training Course Control Document*. See Chapter 5 of Volume III, and TAB A-4 of Volume II of this Manual.

SECTION 5 - REGARDING FORMAT

- It is not necessary that all Navy curricula look exactly alike, right down to the minutest detail.
- What is required is that a particular document must generally look like others of its type.
- What is not necessary, and in fact is counter-productive, is worrying that every document looks exactly like every other of its type, e.g.:

  - Certain words are always capitalized, underlined, placed in parentheses, are all lowercase or uppercase, or end with the same punctuation.
  - Top/bottom and right/left margins are precisely the same fraction of an inch, repetitious data within the document is always placed identically to the nearest fraction of an inch, font style is always identical, pages mirror other similar pages.

5.1. The rule of common sense must apply. If the document is "instructor friendly" and looks to be the same as others of its type, it should be acceptable.

5.2. CCA will provide guidance. The CCA will determine the degree of format flexibility allowed.

SECTION 6 - DEVELOP CLOs

CLOs are "developed" by selecting the appropriate, already-prepared Course Learning Objective Model Statements:

- These "Model Statements" correspond to the Training Objective Statement Group, and Training Objective Statements (TOS), you chose while developing your TPS.
- Refer to the CLO Model Statements as you read the following discussion.

6.1. Prepare the CLOs for your course:

- Use the TPS documents to determine:

  - Titles of all PPPs taught in the course
  - All TOS CODES which apply to each PPP Table

- Select one of the TLAs used in the course (NOTE—arrange TLAs in alphabetical order):

  - First, using the TOS column, note all TOS Codes which apply to the PPP
  - Second, note the title of the PPP Table

MEMORY REFRESHER TOS CODES/NUMERIC VALUES
F - (1) – Familiarization
T – (0-4) – Theory
S – (B/G) – Skill (background)
J - (T/F) – Skill (Task/Function)
O – (1-2) – Operation
P – (1-2) – Preventive Maintenance
C - (1-2) – Corrective Maintenance
M - (1) – Maintenance

  - Third this PPP Table title will be worked into the CLOs

6.2. Use the CLO Model Statements

- Go to the COURSE LEARNING OBJECTIVE MODEL STATEMENTS
  appropriate for your course:

EXAMPLE:

A TLA shows use of these TOS codes:

    O1 – O2 – P1 – C1 – C2
    T0 – T1 – T2 – T3 – T4

CLOs chosen are:

    O1 – O2 – P1 – C1 – C2

- Choose, as the CLOs for this PPP Table, those CLOs
  which correspond to each TOS code(s) assigned to the
  PPP Table.
- In the space provided within each CLO, write the title
  of the PPP Table.

- Repeat this process for each TLA/PPP Table.
- If two or more PPP Tables apply to a CLO they may be
  listed subordinate to the CLO statement.

6.3. The sample "Curriculum Outline of Instruction" (Volume II, Tab A-4) shows the format of the CLO page:

- Note that CLOs in the sample are organized in LP format
  and style so as to require no revision when they become
  an integral part of the LP. All COI elements may be
  formatted like this.
- Note use and placement of title and introductory phrase
  on the first and subsequent CLO pages.
- Knowledge CLOs are always on the left — Skill CLOs are
  always placed on the right.
- Arrange CLOs in ascending order (e.g., T1 ~ T2 ~ T3 ~ O1
  ~ O2 ~ P1).

> - When all CLOs are developed and sequenced, major divisions of the course can be identified as to "Parts" ~ "Sections" ~ "Topics."
>
> - Quickly scanning the sequenced CLOs will reveal "natural breaks:"
>
>   o The PPP Tables become Parts
>   o Skill CLOs become Skill Sections
>   o Knowledge CLOs become Knowledge Sections

6.4. Thoughts about developing CLOs

- The same CLO Model Statement can apply to more than one PPP Table. When this occurs, additional PPP Tables are listed alphabetically within the CLO or subordinate to it.
- You must use the CLO Model Statements to the maximum extent possible.
- However, the CLOs you "write" must also describe accurately the overall skills and knowledge the trainees will acquire upon course completion:

  - To achieve this goal, CLOs may be modified, or "tailored," as required to fit the course.
  - For example, some words or phrases may not apply to your course—these should be deleted.
  - It may be necessary to add a word(s), or phrase(s), to have CLOs that are an accurate reflection of the course and the job to be performed.

- Course completion implies that the trainee can perform the knowledge and skills specified by the OS and to the degree of expertness required by the TOS.

6.5. Training constraints

```
┌─────────────────────────────────────────────────────┐
│                    CLOs AND THE JOB                  │
│                                                      │
│  CLOs closely resemble, and duplicate where possible,│
│  actual skills and knowledge required for job        │
│  performance.                                        │
│                                                      │
│  This includes:  JOB Behavior - JOB Conditions - JOB │
│  Standard.                                           │
│                                                      │
│  Therefore, CLOs describe those skills and knowledge │
│  a graduate must have to perform his job.            │
└─────────────────────────────────────────────────────┘
```

- Schoolhouse constraints, NOT testing constraints, determine how closely job-required skills are able to be duplicated in the schoolhouse:

  - Laboratory configuration and capacity, technical training equipment availability, technical training equipment configuration, previous training received by the trainee, etc.
  - Such factors as these influence the similarity of training-provided skills to job-required skills.
  - The goal of training is the competent performance of job skills – in the work place – to the job standard.

SECTION 7 - COORDINATE CLO MODEL STATEMENTS

7.1. S (BACKGROUND) SKILL CLO: S (B/G) Skill - perform the prerequisite (Background) skills necessary to successfully complete - follow-on training in the COORDINATING the — (operation or maintenance of...([System, Subsystem, and Equipment]); (performance of...[task or function]); (receipt of... [further background training]).

7.2. J (TASK/FUNCTION) SKILL CLO: J (T/F) Skill - Coordinate direction/performance of all—task or function skills.

7.3. OPERATION/MAINTENANCE CLO: O1 Skill - Coordinate all Operational and Maintenance Procedures on the...

7.4. B1/B2 (BACKGROUND) KNOWLEDGE CLO: B1/B2 (B/G) Knowledge - Demonstrate an understanding of the knowledge required to perform the prerequisite (Background) skills necessary to successfully complete follow-on training in *COORDINATING* the (operation or maintenance of... [System, Subsystem, Equipment]); (performance of... [task or function]); (receipt of [further background training]).

7.5. Q TASK/FUNCTION KNOWLEDGE CLO: Q (T/F) Knowledge - Demonstrate an understanding of the knowledge required to COORDINATE direction/performance of all task or function skills.

7.6. FAMILIARIZATION CLO: F1 Knowledge - State the capabilities and limitations of the (Subsystem/Equipment) necessary to understand the related (System/Subsystem) and describe associated documentation.

7.7. OPERATION/MAINTENANCE KNOWLEDGE CLO: T1 Knowledge - Describe the theory and associated documentation necessary to understand all operational tasks and all maintenance procedures, without going into functional circuit details or program flow diagrams.

SECTION 8 - DIRECT CLO MODEL STATEMENTS

8.1. S (BACKGROUND) SKILL CLO: S (B/G) SKILL - Perform the prerequisite (Background) skills necessary to successfully complete follow-on training in *DIRECTING* the (operation or maintenance of... [System, Subsystem, and Equipment]); (performance of... [task or function]); (receipt of...[further background training]).

8.2. J (TASK/FUNCTION) SKILL CLO: J (T/F) SKILL - Direct performance of all task or function skills

8.3. B1/B2 (BACKGROUND) KNOWLEDGE CLO: B1/B2 (B/G) Knowledge – demonstrate an understanding of the knowledge required to perform the prerequisite (Background) skills necessary to successfully complete follow-on training in *DIRECTING* the (operation or maintenance of [System, Subsystem, and Equipment]); (performance of [task or function]); (receipt of [further background training]).

8.4. *Q* (TASK/FUNCTION) KNOWLEDGE CLO: Q (T/F) Knowledge – demonstrate an understanding of the knowledge required to *DIRECT* performance of all task or function skills.

8.5. FAMILIARIZATION CLO: F1 Knowledge - State the purpose, function, and location, and describe the documentation required to understand subsystem capabilities and limitations of the ....

8.6. OPERATION/MAINTENANCE SKILL CLOs:

- **O1 Skill -** Direct normal operational procedures on the
- **O2 Skill -** Direct all operational procedures on the
- **M1 Skill -** Direct all maintenance on the

8.7. OPERATION/MAINTENANCE KNOWLEDGE CLOs

- **T1 Knowledge -** Describe the theory and associated documentation necessary to understand normal operational tasks without going into logic, circuits, program flow diagrams, or mechanical component breakdown of the ....
- **T2 Knowledge -** Describe the theory and associated documentation necessary to understand all operational tasks and all maintenance procedures without going into detailed logic, circuits, individual flow diagrams, or detailed mechanical component breakdown of the ...

SECTION 9 - PERFORM CLO MODEL STATEMENTS

9.1. S (BACKGROUND) SKILL CLOs: S(B/G) Skill - Perform the prerequisite (Background) skills necessary to successfully complete follow-on training in PERFORMING the—(operation or maintenance of System, Subsystem, Equipment); (performance of task or function); (receipt of further background training)

9.2. J (TASK/FUNCTION) SKILL CLO: J(T/F) Skill - Perform all task or function skills

9.3. B1/B2 (BACKGROUND) KNOWLEDGE CLO: B1/B2 (B/G) Knowledge - Demonstrate an understanding of the knowledge required to perform the prerequisite (Background) skills necessary to successfully complete follow-on training in *PERFORMING* the (operation or maintenance of...[System, Subsystem, and Equipment]); (performance of... [task or function]); receipt of... [further background training.])

9.4. Q (TASK/FUNCTION) KNOWLEDGE CLO: Q(T/F) Knowledge - Demonstrate an understanding of the knowledge required to PERFORM all task... or function... skills

9.5. FAMILIARIZATION CLO: F1 Knowledge - State the purpose, function and location, and describe the documentation of the..

9.6. OPERATION/MAINTENANCE SKILL CLOs

- **O1 Skill -** Perform normal operational procedures with supervision on the ....
- **O2 Skill -** Perform all operational procedures with supervision on the ....
- **P1 Skill -** Perform preventive maintenance procedures with supervision on the ....
- **C1 Skill -** Perform documented fault isolation and repair procedures to the authorized maintenance level, with supervision, on the....
- **C2 Skill -** Perform all authorized fault isolation and repair procedures with supervision on the....

9.7. OPERATION/MAINTENANCE KNOWLEDGE CLOs

- **T1 Knowledge -** Describe the theory and associated documentation necessary to support and understand the performance of normal operational tasks without going into logic, circuits, program flow diagrams, or mechanical component breakdown of the....
- **T2 Knowledge -** Describe the theory and associated documentation necessary to support and understand the performance of casualty/degraded/abnormal operational tasks and operational tasks requiring advanced analysis, all routine preventive maintenance, and documented fault isolation and repair without going into detailed logic, circuit analysis, individual program flow diagrams, or detailed mechanical component breakdown of the....
- **T3 Knowledge -** Describe the theory and associated documentation necessary to support all corrective maintenance without going into signal or electron flow, computer instructions, or detailed mechanical component breakdown except for those mechanical or logic elements or circuits unique to the equipment or program of the....

SECTION 10 - DEVELOP OTHER COI ELEMENTS

- The COI presents the course plan, or outline, for achieving the CLOs and TLOs by showing:

  - The subject matter that is to be taught
  - And the order of subject matter presentation

10.1. To develop the COI you must first determine:

- Part Title(s)
- Section Title(s)
- Topic Title(s)
- TLO(s)

10.2. Next, you must determine:

- Organization and sequence of these several components
- You are looking for that arrangement of Parts - Sections - Topics - TLOs that promotes:

  - The most complete knowledge of the material
  - And learning within the shortest possible time

10.3. Prepare the COI for your course

> See Volume II, TAB A-4, for a Sample *Curriculum Outline of Instruction*, in the TCCD as your read the following discussion.

10.4. Prepare the Parts for your course

- The Part is the primary organizational element of the COI/LP and each is divided into one or more Parts:

  - A PPP Table
  - A part of a PPP Table
  - A combination of PPP Tables

- The Part is the largest element of the COI/LP because the PPP is the largest unit of analysis done to identify skills and knowledge to be taught in the training program.

- Title and number of the Part correspond with the related PPP Table title and number: Each Part normally covers all PPP line items from the related PPP which are to be taught.
- Sometimes, "teach ability" may require that one PPP be taught in two or more Parts:

  - As when "familiarization" of the hardware or task/function is taught early in the course
  - And an in-depth coverage of this hardware or task/function is provided later in the course
  - Consideration should be given to using a subsystem PPP table for familiarization and then using the equipment PPP table for the in depth description.

- Several PPPs may also be covered in one Part — such as when the subject of one or more of the PPPs clearly supports the subject of the primary PPP. The purpose of combining PPPs is usually to eliminate the repetition of PPP line items common to a group of PPP Tables

10.5. Determining Part Numbers is derived from the PPP Table Number (for example; PPP Table Number is S0136):

- When the PPP is covered without interruption — S0136
- When coverage of the PPP is divided into two, or more, parts (called "split parts")

  - S0136/1 — 1st usage
  - S0136/2 — 2nd usage
  - When more than one PPP is covered in the part — S0136
  - This part contains information from PPP Tables A0074, B0076, S0136, S0137 and S0138

<div align="center">

NOTE

</div>

Number displayed, e.g., S0136 is that of primary PPP.

- As you will see, parts are comprised of Sections.
- Multiple Parts within a LP are separated from one another by Tab Dividers.
- Part number is placed on the "tab" of the Tab Divider, as follows—"Part S0136".

10.6. Prepare the Sections for your course

- Parts are split into Sections:

  - The Section allows a similar group of skills, for example, "normal operations", "preventive maintenance", and their related knowledge to be taught together
  - The TOS that are assigned to a PPP Table (Part) determine its Section titles.

- The sources of Section titles for Hardware PPPs are the Section Title Model Statements for Hardware PPPs.
- Sections may also be combined in whatever way best fits the training situation and desired outcomes:

  - See following page, for some possible combinations of Hardware PPP Section titles.
  - Combined Sections will reflect by their titles all TOS covered within that section.

- The source of Section titles for Non Hardware PPPs are the proper names of the skill or knowledge areas, etc., covered in that Section, for example: Basic Mathematics – Special Mathematics – Electrical Safety – Direct Current Fundamentals – Oscillators.
- The Section titles for a part are placed on the Tab Divider for that part(see Volume II, Tab A-4). The number before each title shows numerical sequence.

SECTION TITLE MODEL STATEMENTS FOR HARDWARE PPPs

F1 – FAMILIARIZATION WITH _____
T1 – INTRODUCTION TO _____
O1 – BASIC OPERATION OF THE _____
T2 – THEORY OF THE _____
O2 – OPERATION OF THE _____
P1 – PREVENTIVE MAINTENANCE OF THE _____
C1 – BASIC CORRECTIVE MAINTENANCE OF THE _____
T3 – ADVANCED THEORY OF THE _____
C2 – CORRECTIVE MAINTENANCE OF THE _____

COMBINED SECTION TITLE EXAMPLES FOR HARDWARE PPPs

T1/O1 – INTRODUCTION TO AND BASIC OPERATION OF THE _____
T2/O2 – THEORY AND OPERATION OF THE _____
T2/O2/ – THEORY, OPERATION, AND
P1/C1 – PREVENTIVE AND BASIC CORRECTIVE MAINTENANCE OF THE

10.7. Prepare the Topics for your course

- Sections are split into Topics, which are the basic organizational units of instruction:

  - Related TLOs are listed following each Topic title.
  - A statement of rationale (optional) describing intended lesson content and goals may be included if necessary.
  - See Volume II, TAB A-4 for examples.

- Like Sections, Topic titles are also predetermined according to the TOS that are assigned to the Part.
- The sources of Topic titles for Hardware PPPs are the Skill (or Knowledge) Topic Titles for Hardware PPPs.
- The sources of Topic titles for Non-Hardware PPPs are the Skill (or Knowledge) Topic Titles for Non-Hardware PPPs: The Topic, Documentation Description, though listed last (1-7) is usually taught very early in the course. It may stand either by itself, combined with another Topic(s), or placed throughout the course, as necessary.

10.8. Combining Topics

- Topics may also be combined as best fits the training situation and desired outcomes — except that sequence of Topics must not be broken, that is:

  - "General and Functional Description," or "Functional and Operational Description," etc.
  - Are not allowed (unless this particular TLA and/or PPP had no Physical or Interface Description).

- Normally, no more than three Topic titles should be combined — this is to ensure clarity.
- When all Topics for a Section have been identified they are listed on the corresponding Section page to form a "Section table of contents," as per the examples in Volume II, TAB A-4. Note that this table of contents lists the number, title, and starting page number of each Topic in the Section.

SKILL TOPIC TITLES FOR HARDWARE PPPs

O1 – Basic Operation of _____
O2 – Operation of _____

P1 – Preventive Maintenance of _____
C1 – Basic Corrective Maintenance of _____
C2 – Corrective Maintenance of _____

KNOWLEDGE TOPIC TITLES FOR HARDWARE PPPs F1, T1, T2, T3

Topic 1 – General Description of _____
Topic 2 – Physical Description of _____
Topic 3 – Functional Description of _____
Topic 4 – Interface Description of _____
Topic 5 – Operational Description of _____
Topic 6 – Maintenance Description of _____
Topic X – Documentation Description of _____

SKILL TOPIC TITLES FOR NON-HARDWARE PPPs

S(B/G) – Prerequisite Performance of _____
J(T/F) – Performance of _____

KNOWLEDGE TOPIC TITLES FOR NON-HARDWARE PPPs

B – Understanding of _____
Q – Application of _____

10.9. Prepare the TLOs for your course (Volume II, TAB A-4)

- TLOs — reflect the coverage provided in the Topic by using those PPP line items identified by the TLA: Applicable PPP sub-items are either listed under the TLO as they were with the related PPP line item or they may be incorporated in the TLO
- TLOs contain these elements:

  - Behavior
  - Condition
  - Standard (may be implied)

- The behavior consists of:

  - A subject
  - A performance-oriented verb ("action verb")
  - And an object

  > The Behavior identifies what the trainees should be able to do upon completion of the Topic.

- The PPP line item forms the behavior, though the verb
  may be modified to improve clarity (if done, however,
  thought should also be given to likewise modifying the
  PPP's behavior).

10.10. Conditions and Standards

- The condition describes those "aiding" or "limiting"
  conditions which influence how the behavior is performed:

  - The condition is usually traceable back to the
    appropriate TOS—these phrases have been "lifted" from
    the TOS, and incorporation into the TLO as the
    condition.
  - Conditions other than these TOS - related phrases may
    be used as necessary, and, conditions may be implied

  > The condition is critical because this phrase
  > tells the instructor to what depth to cover the
  > related discussion point.

- The standard specifies those criteria which the
  demonstration of performance or knowledge must meet: If
  implied, the standard is assumed to be "without error"
  "100 percent accuracy," etc

  > The standard is critical because it is an
  > indicator of how well the Trainee should be able
  > to perform the job.

- Both condition and standard are discussed in greater
  detail on the following pages

  > Chapter 4 of NAVEDTRA 130B, "Task-Based
  > Curriculum Procedures," provides an in-depth
  > discussion of these TLO elements.

10.11. Aiding and Limiting Conditions

- The TLO condition element describes the circumstances
  under which the behavior will be performed.
  Circumstances must be selected that clarify how the
  behavior will be demonstrated: Most often, the TOS-
  determined condition will suffice.
- Limiting Conditions. These place limits or restrictions
  on desired performance (behavior). Examples include:

- Fieldstrip the M16A2 Rifle while blindfolded.
- Classify received signals according to frequency, modulation, and type of function of the emitter.

- Aiding Conditions. These describe the help or assistance permitted or afforded the trainee in performing the desired behavior. Examples are:

  - Trace signal flow through the receiver, using the schematic diagram provided.
  - Align the IF strip of the radio receiver. Use of the technical manual is permitted.
  - Multiply two three-digit numbers, using a calculator.

- TLOs may require multiple limiting or aiding conditions, or a combination of both to obtain the desired behavior.
- Normal classroom conditions, for example, "given paper, pencil, and appropriate instruction," are not written into the TLO because it is assumed these are always provided.

10.12. Quantity or Quality as Standard. The TLO standard element describes the quantity and/or quality of the trainee output:

- Completeness. The precise nature of the output, number of steps, points, pieces, etc., that must be covered or produced.
- Accuracy. How close to correct performance must be. Exact numbers reflecting tolerances, values or dimensions that acceptable answers/performance assumes.
- Time. Exact time to demonstrate the behavior, when time is a critical factor in behavior performance.

10.13. The LO elements combined

- The following examples, and discussion, will show which is the behavior, the condition, and standard.
- In the example below the standard is implied to be "100 percent accuracy," i.e., "without error". See below example:

Example: Describe the physical interface of the AN/XYZ to the detail required to support basic corrective maintenance:

- In the following example, the entire TLO is the behavior. The condition is implied, i.e., "authorized techniques" implies "advanced corrective maintenance." The condition also implies that the description will be "in your own words." The standard is also implied to be "100 percent accuracy" or "without error".

Example: Describe authorized techniques used to isolate faults, which cannot be located using procedures contained in prescribed maintenance documents.

<div align="center">

NOTE

</div>

Do not imply the condition unless it is possible to infer the level of training required. Perform calibration procedures for preventive maintenance on the ABC meter, using OP YYYY. The meter must be accurate to 1 milli-volt after calibration.

> TLOs are prefaced by the following introductory statement: "Upon successful completion of this topic, the trainee will be able to:" when shifted to the LP Topic Pages

SECTION 11 - HARDWARE TOS-DETERMINED CONDITION STATEMENTS

11.1. TOS INDICATOR

F1 ...to support general duties for...
<div align="center">OR</div>
...general watchstanding duties...

T1 ...to support normal operation of...
T2 ...to support casualty/degraded/abnormal modes of
    operation of...
<div align="center">OR</div>
...to support operation requiring advanced analysis of...
<div align="center">OR</div>
...to support preventive maintenance of...
<div align="center">OR</div>
...to support documented corrective maintenance of...

T3 ...to support undocumented corrective maintenance
    requiring advanced analysis for...

O1 ...in accordance with normal operation procedures for...

O2 ...in accordance with casualty/degraded/abnormal
operation procedures for the...

P1 ...in accordance with preventive maintenance procedures
for...

C1 ...in accordance with documented corrective maintenance
procedures for...

C2 ...in accordance with undocumented corrective
maintenance methods requiring advanced analysis
for...

SECTION 12 - NON-HARDWARE TOS-DETERMINED CONDITION STATEMENTS

- **S(B/G)** in accordance with (prescribed documentation
  for...), (*name of documentation*...), (or other
  appropriate condition or modifier...)
- **J(T/F)** in accordance with (prescribed documentation
  for...), (*name of documentation*...), (or other
  appropriate condition or modifier...)
- **B(B/G)** in accordance with (prescribed documentation
  for...), (*name of documentation*...), (to support the
  PREREQUISITE [Background] Skills of...), (or other
  appropriate condition or modifier...)
- **Q(T/F)** in accordance with (prescribe documentation
  for...), (*name of documentation*...), (to support those
  skills required for the performance of [task or
  function]...), (or other appropriate condition or
  modifier...)

12.1. PPPs may require several TLOs: PPP items may sometimes
require several TLOs to adequately reflect the necessary
training—as illustrated by the following example for the PPP
line item "*Perform preventive maintenance on the CUCV (Type A)*":

- **TLO 1.** Perform preventive maintenance on the CUCV (TYPE
  A) in accordance with preventive maintenance procedures
  in the applicable documentation.
- **TLO 2.** Perform engine tune-up on the CUCV (TYPE A) in
  accordance with preventive maintenance procedures in the
  applicable documentation.
- **TLO 3.** Perform engine oil change on the CUCV (TYPE A) in
  accordance with preventive maintenance procedures in the
  applicable documentation.

- **TLO 4**. Perform chassis lube job on the CUCV (TYPE A) in accordance with preventive maintenance procedures in the applicable documentation.

> Only TLO-1 has a direct relationship with a specific PPP line item. TLOs 2 through 4 do not, but they do amplify TLO 1, and provide guidance that is more definite as to skills the trainees must acquire.

12.2. TLO's consisting of multiple PPPs: Sometimes two to three PPP line items may be combined to construct one TLO as illustrated by the following example for the two PPP line items "Use special tools and test equipment required for maintenance of the CUCV (Type A)" and "Perform preventive maintenance on the CUCV (Type A)" TLO1. Use special tools and test equipment to perform preventive maintenance on the CUCV (Type A) in accordance with preventive maintenance procedures in the applicable documentation.

12.3. Finish the sequencing of your course:

- You have developed all CLOs, TLOs, Parts, Sections and Topics for your course. These COI elements must now be arranged into a logical teaching sequence.
- You should sequence in this order (Parts - Sections - Topics - TLOs).

12.4. To sequence you can go by:

- **Job Performance Order** is the order in which the skills of the job are performed. The sequence is the same as the job sequence. For example, a gunner will learn to load, aim, and then fire the weapon.
- **Chronological Order** sequence flows from: Part - Part Section - Section and Topic - Topic according to the order in which the events covered occur in time. For example, recruits may be taught in order: World War I - World War II - Korean War - Viet Nam - Desert Storm.
- **Critical Sequence**: Ordered in terms of their relative importance. For example, a first aid course may address potentially fatal injuries ~ permanently disabling injuries ~ minor injuries.
- **Simple to Complex**: Sequence in terms of increasing difficulty. For example, marine navigation based on buoys and landmarks may be taught before navigation based on the location of stars or the angle of the sun.

- **Comparative Sequence**: Teach what is already familiar before teaching the unfamiliar. Sailors should study familiar U.S. ships before less familiar foreign ships.
- **Relationship of like COI elements**: Parts: Parts – Sections: Sections – Topics: Topics – TLOs: TLOs. These relationships may be as follows:

  - **Dependent Relationship**. To master one Part (or Section or Topic or TLO), you must first master another Part (or Section or Topic or TLO). Those that must be mastered first are taught first.
  - **Supportive Relationship**. The learning of one COI element transfers over to another COI element and makes mastery of the second element easier. Such COI elements should be sequenced and taught as close together as possible. Schoolhouse situations may also cause support relationships. Examples include availability of equipment, similar conditions ("at night", "on a muddy terrain", "while flying"), safety, and/or cost.
  - **Independent Relationship**. The relationship of like COI elements is such that sequencing is not a major factor in learning. You can sequence and teach these as appropriate.

- **Principle of reverse sequencing**. You may want to reverse one or more of these sequencing techniques. For example, Topics may be arranged in reverse chronological order or from least critical to most critical.
- **Combination approach.** Use a mixture of the methods described to sequence elements of the COI in a logical teaching order. Consider this a tentative sequence for the course. The final sequence will be made after the pilot (course tryout).

12.5. Prepare the OAC for your course

- The **OAC** (Profile Item-To-Topic Objective Assignment Chart) is:

  - An administrative tool designed to reflect the coverage of PPP items within a curriculum
  - And is structured to correlate PPP item coverage to specific TLOs within a curriculum

- Prepare the OAC in accordance with the guidelines below.
  An example is shown in Volume II, TAB A-4:

  - TABLE column—identifies each PPP table once per page,
    followed by "(Cont)" as appropriate. List tables in
    ascending order.
  - ITEM column—lists PPP items sequentially, starting
    with the 1-1 series and ending with the 2-2 series for
    each PPP table listed in the "TABLE" column. Whenever
    ALL sub-items of a PPP item are not applicable to the
    same TLOs, the sub-items covered must be listed
    separately. In some cases, a PPP item or sub-item may
    be listed more than once due to coverage in different
    Parts/Sections/Topics and/or coverage at different
    training levels.
  - TOS column—arranged so the sequence of TOS listing per
    profile item or sub-item is T0, F1, T1, T2, T3 for
    knowledge categories, and O1, O2, P1, C1, C2 for skill
    categories, as appropriate.

12.6. Finish the OAC

- **VOL** column—lists the volume where the TLO is located if
  the LP is a multivolume set; otherwise, no entry is made.
  Enter volume number in the "VOL" column at the beginning
  of the page and when the volume number changes
- **PART** column—lists the part in which the TLO is found if
  the part number is different than the table number.
  Otherwise, no entry is made
- **SECT** and **TOPIC** columns—specify the Section and Topic in
  which the PPP item or sub-item is covered
- **LRNG OBJ** column—specifies the TLO which relates to the
  PPP item or sub-item.
- **TEST ITEM** column optional, and relates test item number
  to Topic Learning Objective
- **Resource Requirements List** (includes these elements):

  - Texts. List all text materials (e.g., LP and TG) to
    be used in the course.
  - References. List in alphanumeric order, all reference
    documents used in the course
  - Equipment. Includes all equipment, special tools and
    test equipment, including:

    - Technical training equipment by Mk, Mod, and
      official name

- Specialized test equipment and instructional tools such as mock-ups and models
- Computer terminals supporting computer-based instruction and Interactive Courseware (ICW)
- Common hand tools and general purpose test equipment. Those given a group listing in technical manual are listed by group name rather than individually
- Pre-faulted modules

- Films. Also includes videotapes and videodiscs.
- Graphics. List transparencies, wall charts, slides, photographs, etc., and Interactive Courseware (ICW).
- Support materials. Not all instruction sheets contained within a Trainee Guide, list instruction sheet number, title, and quantities required per class.
- Other. List as required.

- Profile Item-to-Topic Objective Assignment Chart (Final)

> See Volume II, TAB A-4, for a Sample Resource Requirements List, in the TCCD as your read the following discussion.

SECTION 13 - PREPARE THE FINAL TCCD

13.1. You will recall that:

- The TCCD is the primary course developmental and management document.
- The approved TCCD serves as authority for further development and provides information needed by the curriculum developers to create the training materials.

13.2. Description and application of the TCCD

- The TCCD is a collection of products, which expresses in summary form, the content, structure, and essential management information for a course.
- Most of the information has already been developed in the form of the COI.

13.3. Final TCCD elements are:

- Front Matter: Includes Cover Page – Letter of
  Promulgation – Table of Contents – Foreword – Course Data
  Page –Trainee Data Page – Other, as required

- Curriculum Outline of Instruction: Includes CLOs – Part
  Title(s) – Section Title(s) – Topic Titles – TLOs

- Annexes: Includes Resource Requirements List – Course
  Master Schedule – Fault Applicability List – Profile
  Item-to-Topic Objective Assignment Chart

> A sample TCCD is shown in Volume II TAB
> A-4.

13.4. Develop Front Matter

- Cover Page: Contains the same information as the
  Training Project Plan Cover Page

- Letter of Promulgation: Issued after successful course
  pilot, at the initial CCA review and approval. It
  consists of a "reserved" page

- Table of Contents: Self explanatory

- Foreword: Not required, but serves as a place to explain
  to reviewers any unique aspects of the course which may
  not be apparent from the basic data

- Course Data Page: Data should be identical to that
  listed on the TPP's Course Data Page

- Trainee Data Page (Includes the following elements):

  - Personnel Physical Requirements. For a rating (YN,
    RP, AT, etc.) these physical requirements are found in
    "Manual of Navy Enlisted Manpower and Personnel
    Classification and Occupational Standards, NAVPERS
    18068."

    – Additional physical requirements may be imposed by
      specialty groups (aircrew, SEALS, diver, etc.) which
      involve many ratings.

–   Specific physical requirements for each specialty
    group are found in "Manual for the Medical
    Department, NAVMED P-117."

•   Security clearance. This is the security clearance
    necessary for the course and/or the teaching site.
•   Prerequisites. Copy this information from the Course
    Data Page of the Training Project Plan. An entry of
    "In accordance with CANTRAC" may also be used.
•   Obligated service. Obtain this information from the
    NAVMILPERSCOM manuals. An entry of "In accordance
    with the Enlisted Transfer Manual" may also be used.
•   NOBC/NEC earned. Copy this information from the same
    entry on the Course Data Page.

13.5. Incorporate the COI

•   The COI is placed exactly as compiled earlier into the
    TCCD, where indicated by the sample TCCD shown in
    Volume II.
•   Include all new or modified PPP Tables, PPP Table Index
    listing existing PPPs used, and the TPS, for the course
    to facilitate review and approval of the TCCD.

    •   Lists faults by identification number
    •   Lists supporting documentation/directions

SECTION 14 - WHAT IS NEXT?

14.1. Complete the Annexes

•   Completing the Annexes involves finishing documents you
    began developing in earlier stages, beginning with:

    •   Resource Requirements List (Final)
    •   Profile Item-to-Topic Objective Assignment Chart
        (Final)
    •   Course Master Schedule (CMS):

        –   Group Lesson Topics for continuity. For example,
            start and end laboratory sessions on the same day;
            attempt to schedule closely related Lesson Topics so
            that one Topic in the series is not left to the next
            day or over a weekend.
        –   Note differences between curriculum periods; the
            time required, without any constraints, to teach
            lesson topic classroom, labs and, course periods —

those periods required to teach lesson topic classroom and labs after factoring in constraints, such as course bottlenecks or additional course sections and Total Course Length, the sum of course hours (including constraints), testing periods and administrative periods, when building the CMS.

- Schedule tests at about 40/-50/ instructional hour intervals throughout the course, where they should naturally occur.

- **Fault Applicability List (FAL):**

  - Lists all planned equipment faults
  - Identifies the equipment/system to be faulted
  - Faults that may apply and that may be used to further student learning, in addition to those required should be listed

- Using all elements of the TCCD you've just finished, especially the COI, you will develop the curriculum to include (LP – TG – IMM's).
- Where the LP is concerned, you will find all the hard work behind you, because the COI is most of the LP: You will also discover that outlining the TLOs for each Topic creates that topic's discussion points.
- The remaining tasks are to list the reference for each DP to guide instructor personalization and determine supporting material for each.
- Contents of the TG are determined by studying the LP contents, technical documentation applicable to the course, and, of course, the Job Sheets, and deciding what amplifying information the trainee needs.
- IMM is best developed by examining the critical skills, or Job Sheets, that must be learned, and the DPs of the LP, and deciding the most appropriate media to illustrate the DP or critical skill.

STAGE THREE

CHAPTER 6

LESSON PLAN

INTRODUCTION

The curriculum provides a plan for learning. The care and energy devoted to training materials development will have a direct bearing upon the ability of the course graduates to perform the job for which they have been trained.

In the preceding chapter, parts, sections, lesson topics, and Learning Objectives were developed and organized into a logical and effective instructional sequence, as summarized in the Training Course Control Document (TCCD). During the continuation of the develop phase, the curriculum is developed to support the objectives.

This chapter will discuss Lesson Plans (LP). The following chapters will discuss the remaining training materials designed to supplement the instructor's presentation or to assist the trainee.

Development of the LP, Trainee Guide (TG) and tests, to a large extent, occurs simultaneously. That is, as you are creating an LP, TG, or Test you are shifting back and forth to the other two as good ideas come to mind. **Hence, it is important to read all three chapters before attempting to develop either a LP, TG, or tests.**

SCOPE

- Provide the guidelines for LP format
- Provide a step-by-step procedure for developing Lesson Topics/LP
- Instructional methods used most often in the Navy

COURSE MODIFICATIONS

Course revisions and modifications are discussed in volume III, chapter 7.

Identification of LP elements/pages affected by a revision or modification is discussed in this chapter under Training Materials Modifications.

SECTION 1 - A LESSON PLAN

- Programs the use of all other training materials

- Contains learning objectives that reflect knowledge and/or skills attained upon successful completion of the course
- Provides an outline of instructional materials to be taught in a logical and efficient manner
- Provides specific equipment and instructional media requirements, and guidance for conducting the course

SECTION 2 - ELEMENTS OF THE LESSON PLAN

The LP, depicted in Figure 6-1, consists of the following minimum elements:

- Front Matter
- Lesson Topics
- Resource Requirements List (RRL) (Optional)

> It is highly unlikely to have a formal course which consists of only one Lesson Topic. When multiple Lesson Topics are combined and organized, they form a LP. Volume II, Tab A-5, contains a sample of a LP, which meets the minimum requirements of this manual.

RRL *
Lesson Topic 1.2
FAL
Lesson Topic 1.1
Course Learning Objectives
How to use the Lesson Plan *
Safety/Hazard Awareness Notice
Security Awareness Notice
Table of Contents
Change Record
List of Effective Pages
Title Page
Cover Page *
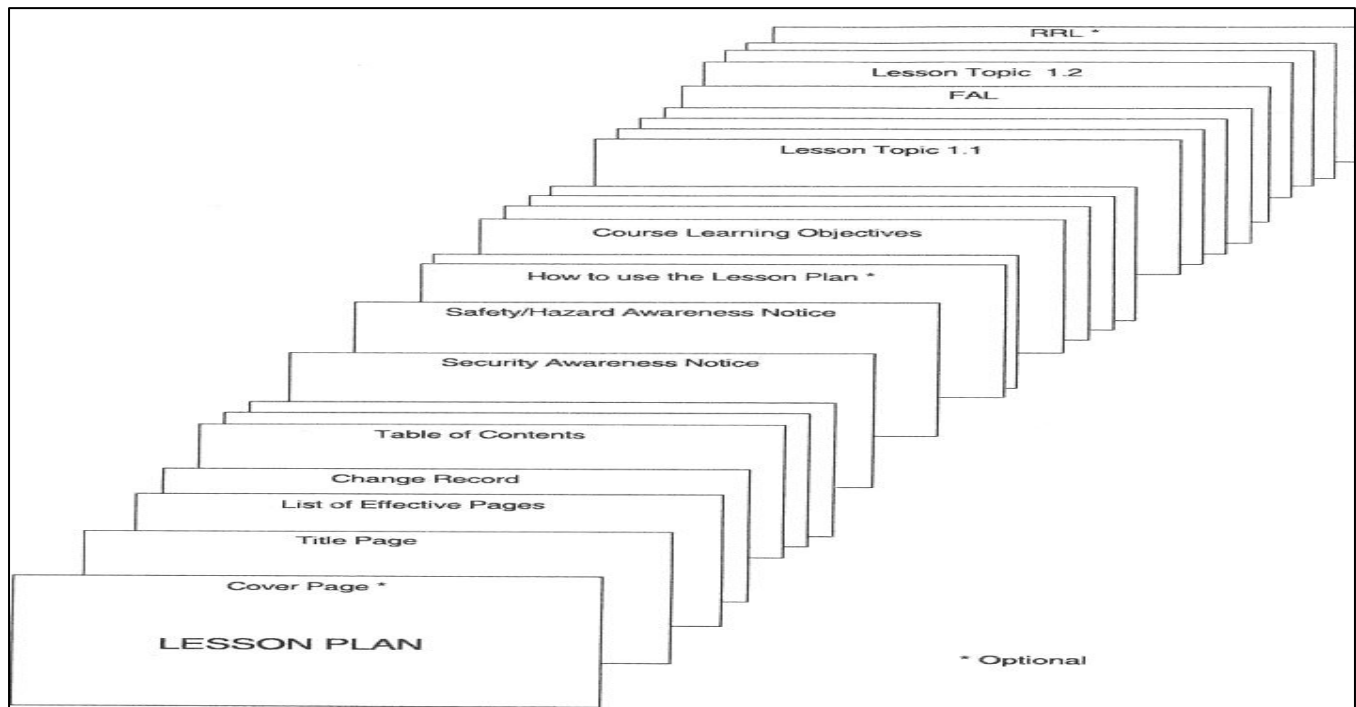LESSON PLAN
* Optional

FIGURE 6-1: LESSON PLAN ORGANIZATION

2.1. Front Matter

- Consists of the following elements in this order:

  - Cover Page (Optional)
  - Title Page
  - Change Record Page
  - Table of Contents Page(s)
  - Security Awareness Notice Page(s)
  - Safety/Hazard Awareness Notice Page(s)
  - How to Use the LP (Optional)
  - Terminal Objectives Page(s)

- Each page except the Cover and Title pages:

  - Has a two-line running header consisting of:

    – The phrase LP
    – The Course Identification Number (CIN)

- See LP in Volume II, Tab A-5, for an example of the layout. If there are multiple volumes, the volume number will follow the CIN

COVER PAGE (Optional)

- Printed on heavy paper stock or equivalent material
- Optional at the Course Curriculum Model Manager's (CCMM) or the Curriculum Control Authority's (CCA) direction
- If required, the Cover will contain:

  - The phrase LP
  - Course title
  - CIN
  - Security classification (if applicable)
  - CCMM's name and address
  - CCA's name and address
  - Date the LP was prepared
  - An identification seal such as the Navy seal, community logo, or similar illustration may also be added

TITLE PAGE

- The Title Page provides for easy identification of the course, including information on the revision and change version of the course

- The Title Page will contain:

  - The phrase LP
  - Course Title
  - CIN
  - Revision number in Alpha characters following the CIN (if required)
  - The word Change with Arabic number following the CIN (if required)
  - Volume number (if a multi-volume LP)
  - Security classification (if applicable)
  - Name and address of CCMM
  - Name of CCA
  - Month and year the LP was prepared. If a revision, the later date is placed in parentheses under the original promulgation date.

CHANGE RECORD PAGE

- The Change Record provides space for recording information related to training materials modifications incorporated into the LP after it is approved for implementation.
- Under the heading Change Record, provide space to record:

  - Number and description of change
  - Name of the person inserting the change
  - Date change entered

TABLE OF CONTENTS PAGE(S)

- Under the heading Table of Contents, for a single volume LP list:

  - Front matter elements, such as Change Record, Security Notice
  - The Table of Contents itself will not be listed
  - All Lesson Topics by unit, number, and complete title in the order in which they appear

- Under the heading Table of Contents, for a multiple volume LP:

  - In the first volume, list the complete contents of all volumes in the LP
  - In subsequent volumes, only the Lesson Topics in that volume will be listed by unit, number, and complete title in the order they appear

SECURITY AWARENESS NOTICE PAGE(S)

Each LP shall bear the highest security classification demanded by its contents.

- Under the heading Security Awareness Notice:

  - State whether classified material is contained in the course or not.
  - Describe procedures for handling and safeguarding classified materials used in the course.

- Refer to the latest OPNAVINST 5510.1 (series) on Security Program Regulations to ensure that all training materials are marked and handled in accordance with the latest policy guidance.

> The Security Awareness Notice should be as individual as the course. This notice does not relieve the developer from the responsibility of incorporating security requirements throughout the course.

SAFETY/HAZARD AWARENESS NOTICE PAGE(S)

- Under the heading Safety/Hazard Awareness Notice:

  - Identify hazards to personnel and equipment.
  - Provide special direction to personnel concerning safety.
  - Provide safety precautions for the protection of personnel and equipment.
  - Provide specific policy on Training Time Out (TTO).
  - Provide for designated Volunteer High Risk Courses specific policy on Drop on Request (DOR).
  - Describe the purpose of the Emergency Action Plan (EAP).

- Provide instructions for the reporting of safety and hazard violations.
- Specify safety and hazards found in the course.
- Identify relevant documentation containing specific precautions and preventive measures.

> Refer to NAVEDTRA 135 (series) and NETCINST 5100.1 (series) on Training Safety to ensure that the latest policy guidance is incorporated in the notice.

TOPIC LEARNING OBJECTIVES PAGE(S)

> The Safety/Hazard Awareness Notice should be as individual as the course. This notice does not relieve the developer from the responsibility of incorporating safety throughout the course.

- Under the heading Topic Learning Objectives (TLO):

  - List the TLOs in numeric sequence
  - After each TLO list the Identification Number of the Course Training Task List (CTTL) item from which it was developed.

> TLOs will be the same as the TCCD COI.

2.2. Lesson Topics

- Lesson Topics are organized into Units and Lesson Topics

  - Units and Lesson Topics are numbered the same as the TCCD COI.
  - Units are listed in the Table of Contents for organization purposes but there are no Unit pages.

- Each Lesson Topic contains two parts:

  - Topic pages
  - Discussion Demonstration Activity (DDA) pages

- Each page of the Lesson Topic:

  - Has a three-line running header

    - First line contains the phrase LP

– Second line contains the unit number, unit title and the CIN
  – Third line contains the Lesson Topic number and title

- Has the Lesson Topic number and title centered on the first Topic Page
- Has on all following Topic and DDA pages, the Lesson Topic number and title flush left under the Unit number and title
- Displays all Topic page information in dual columns of approximately the same width. This is commonly called "newspaper" columns because the information continues from the bottom of the left hand column to the top of the right hand column.
- Displays all DDA page information in dual columns

TOPIC PAGES

- The Topic Pages list:

  - Allocation of classroom and laboratory time
  - Topic objectives (appended with their CTTL numbers)
  - Trainee preparation materials
  - Instructor preparation materials
  - Training materials required

- Under the headings Class Periods and Lab Periods, list in periods, not in hours or minutes, the time required for the Lesson Topic.

  - Periods are defined in NAVEDTRA 135 (series).
  - Time usually will not be listed in fractions of a period. If it is necessary, the time should be shown in quarter-period increments (.25, .50, .75).
  - If the Lesson Topic has both classroom and laboratory periods, list both. If not, list only the applicable periods.
  - The time displayed represents the total time necessary to present the Lesson Topic or conduct one laboratory session. For example, a two-period laboratory session which must be conducted in three shifts would be shown as two periods, not six. It does not include testing time associated with the Lesson Topic.
  - Testing periods are shown on the Course Master Schedule.

- Under the heading Topic Title, list the enabling objectives in the order they are taught.

  - Topic Objectives will be the same as the COI.

  > If, during the development of the Lesson Topic, a particular Topic is determined to be incorrectly titled and/or sequenced, make required changes and update the TCCD COI accordingly.

- Under the heading Trainee Preparation Material, list Trainee Support Material and Reference Publications.

  - Under the heading Trainee Support Material, list individually each instruction sheet to be studied/reviewed by the trainees prior to starting the Lesson Topic, such as, Outline Sheet 7-1-1, Information Sheet 7-1-2. These Instruction Sheets were assigned in the previous Lesson Topic. If no support materials are to be reviewed, enter the word "None".
  - Under the heading Reference Publications, list all material to be read by the trainee prior to starting the Lesson Topic, such as technical manuals or instructions.

    - All references will be listed by identification number/publication number, full title, and source (if not obvious from the number/title).
    - Any publication listed here will also be listed as an Instructor Preparation Reference Publication.
    - If no reference publications are required, enter the word "None".

  - Trainee Preparation Materials will usually be listed in the DDA pages as part of the Assignment in the previous Lesson Topic.
  - Trainee Preparation Materials will either be referred to or reviewed with the trainee and therefore will appear in the Related Instructor Activity (RIA) column.

- Under the heading Instructor Preparation:

  - Enter the phrase Review Assigned Trainee Materials

- Under the heading Reference Publications, list all references which are cited as "Refer to" or "Reference" in the RIA column

  - All references will be listed by identification number/publication number, full title, and source (if not obvious from the number/title).
  - No reference will be listed under Reference Publications if it is not cited in the RIA column.

- Under the heading Training Materials Required, list all support materials which are required for the instructor to present/conduct the Lesson Topic, such as publications, wall charts, transparencies, and fault insertion guides.

  - Support materials will be listed by type and identification number.
  - If all Instruction Sheets are bound into a TG, list "TRAINEE GUIDE".
  - If the Instruction Sheets are issued separately, list the individual Instruction Sheet by type and number.
  - "Refer to" publications are those to be used by the trainee during the Lesson Topic and are listed by number and title.

Such common classroom materials as desks, chalk/VAP boards, podium, overhead projector, and screen will NOT be listed under Instructor Preparation.

DISCUSSION-DEMONSTRATION ACTIVITY
(DDA) PAGES

- DDA pages consist of two columns labeled:

  - Discussion Point (DP)
  - RIA

- Under the heading, DP lists all points to be covered, in the proper sequence for presentation, including all sub-points necessary to ensure the proper level of coverage for each discussion point

  - The first DP will be numbered 1, and will be under the heading Introduction:

- Review the Lesson Topic Title.
- Provide an overview of the Lesson Topic.
- Provide motivational statements on importance of the subject matter.
- List any safety precautions related to the Lesson Topic.

- For Lesson Topics which include labs involving equipment, the first DP will also include a review of Training Time Out (TTO) procedures.
- For courses, which are, designated Volunteer High Risk Courses, the Introduction DP of each laboratory Lesson Topic will review DOR procedures.

> NAVEDTRA 135 (series) and NETCINST 5100.1 (series) contain the latest policy, requirements, and procedures for training safety and the TTO and DOR programs.

- All DPs that follow:

  - Will be numbered consecutively, starting with "2"
  - Support the Lesson Topic Title
  - Will be presented in objective sequence
  - Cover facts, concepts, principles, and procedures that trainees must know to accomplish the tasks being trained
  - Break down the general concepts into their simplest component parts and segments, which are presented one by one
  - Will be presented in sufficient detail to lead the instructor smoothly and comprehensively through all portions of the presentation
  - May range from minimal to a level of detail where no research of the technical documentation is necessary

> The DPs guide the instructor's presentation so, normally, only key words or phrases are entered.

EXAMPLE:

   3.

     a.

      (1)

       (a)

- DPs will be listed with ample space between DPs for the instructor to insert notes and examples as part of his personalization of the topic.
- Personalization occurs when the LP has been issued to the instructor.

- A DP labeled Summary and Review will:

  - Be a review of the major DPs;
  - Condense and repeat the principal points of the Lesson Topic;
  - Condense and repeat the Topic Title; and
  - Check the trainee's comprehension of the Lesson Topic by providing review questions/problems

- The final DP for most Lesson Topics will be labeled assignments and will:

  - Direct the trainees to Instruction Sheets which will assign homework to reinforce the Lesson Topic material.
  - Direct the trainees to Instruction Sheets which will assign trainee preparation for the next day's Lesson Topic(s).
  - Tell trainees when the test on the Lesson Topic will occur.

- For Lesson Topics which combine classroom and laboratory sessions, in addition to the Summary and Review and, if appropriate, the Assignment, there may be an Application.

  - Application directs the trainees to an instruction sheet, usually a Job Sheet, which assigns a problem or laboratory exercise that allows the trainee to practice what has been taught.
  - When safety is part of a DP, it should begin with the words Safety Precaution, followed by the specific information.

- When there are multiple teaching facilities:

  - Verify that each site has the equipment, etc., before including the requirement in the Lesson Topic.
  - Site-unique requirements, which because of resource constraints cannot be changed to a standard, require a site-specific alternative DP or special instructions to the instructor.

- Under the heading Related Instructor Activity, the RIA column gives the instructor specific directions which:

  - Are keyed/numbered to correspond to the DP in the DP column to which they relate

    – There need not be an entry in the RIA column for every entry in the DP column.
    – There must be an entry in the DP column for every item in the RIA column.
    – A DP is not required to contain reference if the DP is not a teaching DP, e.g., review and summary, critique and assignment.
    – An upper-level DP is not required to contain a reference if all the lower-level DPs contain references equals the intent of the upper-level DP.
    – A lower-level DP is not required to contain a reference if the reference for the upper-level DP contains the information needed for the lower-level DP.
    – A DP is not required to contain a reference if it contains an instruction sheet or an exercise sheet, and this sheet contains the appropriate reference.

  - Refer to reference documents that the instructor can use to prepare to teach a DP.
  - Refer to support materials and appropriate demonstrations that are to be used to support DPs.
  - List actions to be performed by the trainees during the presentation of instruction; such as, take notes, refer to.
  - Provide guidance to the instructor on how to present the DP.

    EXAMPLES: "Draw on board," "Demonstrate procedure...," "Reference MILPERSMAN 5030320...." update

  - Use the phrase "Reference..." to direct the instructor where to locate information needed to prepare to teach a discussion point. The first time the reference is listed in the RIA column, list it by complete number and title
  - Use the phrase "Refer to..." to direct the instructor to use in class a particular reference, document, or Instruction Sheet.

6-13

- Use the phrase "Display..." to direct the instructor to use a particular Instructional Media Material (IMM) referenced by identification number and title.
- May use phrases such as "Demonstrate...," "Show...," and "Point to..." as appropriate to tell the instructor what actions are required.
- May use the phrase "Review as Required" to indicate points in the Lesson Topic where the amount of discussion depends on the trainees' understanding and must be a judgment call on the part of the instructor.
- Include under the Introduction DP: Directions to the instructor to introduce self if it is the first time the instructor and trainees have met, and any specific relationships or examples that the instructor should cover.
- Label and clearly state problems/exercises at the appropriate point, along with the correct answers.
- Provide answers to questions on assignment sheets, job sheets, and problem sheets at the appropriate point.
- Refer to instruction sheets by type and number, such as, Job Sheet 4-2-4, in the order of their use within the Lesson Topic.

  - The phrase "Question number and answer" indicates the question number shown on the Instruction Sheet and the correct answer.
  - When questions on Instruction Sheets do not have discrete answers, this should be indicated.

- Cite or assign all Instruction Sheets provided in the TG.
- Provide additional information on DPs to be emphasized, such as safety precautions.
- Describe demonstrations to be performed by the instructor.
- Provide guidance for administering trainee practice sessions/labs.
- Provide directions to the instructor for classroom or laboratory environmental requirements such as temperature, lighting, ventilation, and cleanliness.
- Indicate testing points and use of the Administrator's Guide for administering the tests.
- Chapter 8 of this volume will discuss the Administrator's Guide in detail.
- Include a Fault Applicability List (FAL) if the laboratory has pre-faulted modules or fault able modules. The FAL:

- Identifies the equipment/system to be faulted
- Lists faults by identification number
- Lists supporting documentation/directions

SECTION 3 - LESSON PLAN SPECIFICATIONS

> The curriculum developer should ensure that the LP
> contains all the guidance, directions and information an
> instructor will need to present a course. Trainees are
> more likely to grasp and retain facts and concepts
> presented; with interesting support, materials and which
> are arranged in a way that enhances learning.

- LP's will be oriented horizontally, that is, 11" x 8 1/2"
  on standard paper. This is often referred to as
  landscape layout.
- LP's may be organized into one or more volumes.
- Do not repeat all elements of the Front Matter for each
  volume, except where specifically stated.
- A volume will consist of approximately 200 sheets of
  paper.
- LP's may be printed on one side of the page or back to
  back. The phrase "This page intentionally left blank" or
  similar phrase will NOT be required on blank pages unless
  all pages must be accounted for because of the classified
  nature of the Lesson Topic.
- Front Matter pages will be numbered:

  - Consecutively, using Arabic numerals
  - In the lower right-hand corner of the page

    - A page number is not placed on the Cover page.
    - A page number is not placed on the Title page;
      however, it is counted as page 1.

- Lesson Topic pages will be numbered:

  - Consecutively within the Lesson Topic using Arabic
    numerals
  - In the lower right-hand corner of the page. The
    number will consist of the following parts, written in
    this order:

- Part number
- Section Number
- Lesson Topic number
- Sequential number, starting with 1

EXAMPLE: S0136/2-1-2-3-15, represents the 15th page of DP3.

- RRL (Optional)

SECTION 4 - TRAINING MATERIALS MODIFICATIONS

- If components of a LP (i.e., individual lesson topics) are revised as part of a revision, an alpha character starting with "A" for the first revision will follow the CIN on the LP Cover Page and a new publication date will be shown in parentheses under the original publication date. A new Change Record Page will be inserted, as all outstanding Changes will be picked up by a Revision. Revised lesson topics will be printed and replaced as an entirety, with the alpha character appended to the CIN at the top of each lesson topic page.

EXAMPLE: A-433-0023A

- If components of a LP are changed as part of a Change, the term Change, with a number starting with 1 for the first Change, will follow the CIN on every page affected by the Change. All changes are entered on the Change Record page.

EXAMPLE: A-433-0023 **Change 1**

- Interim Changes are entered by the instructor as directed by the CCMM. Instructors can apply pen and ink changes only, cannot delete or modify information. Technical Changes are usually received as a package of replacement pages. The entry is noted on the Change Record page. The CCMM will retain all Interim and Technical Changes for inclusion in later Revisions or Changes as appropriate.

SECTION 5 - LP/LESSON TOPIC DEVELOPMENT

Some developers can use the content and format guidelines presented in the previous sections to develop new and revised LPs or individual Lesson Topics. If a more structured approach

is desired, the following seven-step development plan will aid in development of a LP and Lesson Topics:

- Review the Course Learning Objectives
- Review the technical documentation
- Organize the individual Topic Learning Objectives and Lesson Topics
- Choose or develop Visual Information (VI) aids and IMM
- Prepare initial Lesson Topics/LP
- Conduct Pilot
- Finalize Lesson Topics/LP

STEP 1:   REVIEW THE COURSE LEARNING OBJECTIVES

- Review the COI in the TCCD to determine:

  - The course's Topic Learning Objectives and Topic Title
  - The course sequence
  - Any modifications required in the objectives or sequence

- Objectives may be modified because:

  - The cost associated with performance objectives is prohibitive and "paper and pencil" alternatives must be substituted for actual hands-on training.
  - Required equipment or publications are unavailable or not available in the quantity needed.
  - Constraints in training time do not allow enough time for trainees to practice or reach a specific level of proficiency.

- Lesson Topic Titles may be re-sequenced for reasons as:

  - More time is required to practice or prepare for a performance test.
  - A Lesson Topic requires more time to teach than was estimated.
  - A Lesson Topic's content is a prerequisite to another Lesson Topic.

- TCCD modification:

  - Modifications, which do not affect the course length or resources, may be approved by the CCMM.

- Modifications which do affect the course length, or resources require submittal of a TPP per OPNAV Memorandum for Destruction 7000 Ser N1/127189 of 15 September 2008 and NETCNOTE 1500 of 4 January 2010. Information on TPPs may be found in Volume III, Chapter 2 of this manual.
- All modifications in objectives, Lesson Topic title, or sequence must be incorporated in the TCCD Outline of Instruction.

> The final TCCD Outline of Instruction must be the same as the sequence of objectives in the approved course.

STEP 2: REVIEW THE TECHNICAL DOCUMENTATION

- Review the supporting technical documentation and determine the main points to be included in the Lesson Topic:

    - To be appropriate, information must support the objective(s).
    - To be useful, information must aid both the instructor and the trainee in the learning process.

> The developer should always begin Lesson Topic development with the latest reference material, but the developer's own experiences, and the experience of other subject matter experts, should also be considered.

STEP 3: ORGANIZE THE INDIVIDUAL LESSON TOPICS

- Organizing the individual Lesson Topic consists of:

    - Developing a content outline
    - Selecting an instructional method

- Develop a content outline to support the objectives:

    - Begin by outlining the objectives. Normally the behavior elements of the objectives are the elements of the outline.
    - Develop subheads from these elements.

- Add additional DPs if more detail is required.

> Different levels of detail may be used within a single course/topic, if appropriate. The final decision as to depth of coverage for each DP shall be at the discretion of the course developer.

- DPs may be added in the order in which events/steps happen or in the order to be followed in carrying them out.

  EXAMPLE: Discuss cleaning, priming, then painting metal surfaces.

- DPs may be added according to some directional strategy — top-to-bottom, bottom-to-top, the center to the outside.

  EXAMPLE: Discuss a control panel on a plane by describing first those instruments in the center most often used, then moving out toward the surrounding instruments which are used least often.

- DPs may be added so that one set of conditions is given as a cause for another set.

  EXAMPLE: Discuss the effect of two dissimilar metals in contact with each other when an electrolyte is introduced causing galvanic corrosion.

- DPs may be added to show that a problem exists and then offering a corrective action that is practical and desirable.

  EXAMPLE: Discuss implementation of a safety program to reduce the number of traffic fatalities during a holiday period.

- DPs may be added which are for or against an item or show advantages - disadvantages of an event providing fairly even attention to both sides

> Before revising an existing Lesson Topic or developing a new one, review existing material and select what is applicable. Look for other courses in the Navy, other military agencies, and other government agencies which teach the same subject or use the same equipment.

  EXAMPLE: Discuss various types of methods.

- DPs may be added to describe categories such as classes and components.

  EXAMPLE: Discuss classes of ships.

- Select the instructional method which suits the object(s).
- The methods used most often in the Navy are:

  - Lesson
  - Demonstration

- A Lesson is a presentation of information, concepts, or principles by a single individual to a group of listeners. It is interactive in nature. It involves VI aids and involves two-way communication.

EXAMPLES: Skill, knowledge, or values orientation
            Teaching fundamental facts and terminology

- VI in support of a lesson is used to:

  - Focus trainee interest and attention
  - Show basic structure of a concept
  - Relate general concepts to an observable reality
  - Turn difficult concepts into meaningful pictures
  - Explain relationships

NOTE

Chapter 9 of this volume provides more information on VI.

EXAMPLE: Introducing new equipment using illustrations, a model, or the actual equipment

- Demonstration is the process wherein one person does something in the presence of others to show them how to do it or to illustrate a principle. It covers all the steps students need to learn a skill, in an effective learning sequence.

EXAMPLE: Showing the effects of acid on metals

- The instructor presents a demonstration, then it is followed by some type of repetition, and then the trainee practices what has been demonstrated.
- Repetition is used to reinforce the action being demonstrated. Types of repetition include:

  - Instructor Repetition
  - Trainee Repetition
  - Instructor-Trainee Repetition
  - Group Performance Repetition
  - Coach-and-Pupil Repetition

- Trainees practice under supervision until they have attained the required proficiency and then they will usually be evaluated by a performance test.
- Chapter 8 of this volume provides more guidance on Performance Testing.
- Multiple methods may be used in the same Lesson Topic.

EXAMPLE: Theory and a performance might be incorporated into the same Lesson Topic.

STEP 4: CHOOSE OR DEVELOP VI AIDS AND IMM

- Use VI aids and IMM in a Lesson Topic to provide:

  - Training when equipment, space, or time is lacking
  - Remedial or accelerated instruction
  - Reinforcement
  - Instruction in subjects, which are difficult to present

- Review existing VI aids and IMM for application to Lesson Topic.

  - Consult Defense Imagery at http://www.defenseimagery.mil/index.html for a list of existing VI aids and IMM which might support the Lesson Topic.
  - Review technical documentation for possible illustrations.
  - Review material used in other courses teaching similar subject matter.

- Develop VI aids and IMM complying with guidelines discussed in Chapter 9 of this volume.

- Whatever the instructional media selection, it must support and help achieve the learning objectives.

STEP 5:   PREPARE INITIAL LESSON TOPIC/LESSON PLAN

- Prepare a Lesson Topic draft which includes the basic elements of the Topic and DDA pages or Front Matter and Lesson Topics for the LP:

  - Use of computers/word processing equipment in preparing the Lesson Topic/LP is highly encouraged.
  - Review CCA and CCMM requirements for word processing program to be used, font size, and specific formats beyond those established in this manual.
  - Review the printing and publications guidance in NAVEDTRA 135 (series) to ensure compliance.

- Use classified material only when absolutely necessary.
- Review OPNAVINST 5510.1 (series) to ensure compliance with marking and handling requirements for classified material.
- Coordinate quality assurance assistance review with the learning functional area or the Quality Assurance Officer.
- Coordinate review of instructional materials by the CCA, if appropriate.
- Volume III of this manual and NAVEDTRA 135 (series) provide specific guidance on the management of curriculum development.
- Steps 6 and 7 actually occur after all curriculum materials have been developed.

STEP 6:   CONDUCT PILOT

Conduct a pilot for an entire course or a major segment of the course, usually at least one unit in length. This process is discussed in Chapter 10 of this Volume and in Volume III, Chapter 7.

- Review material for correctness and completeness.
- The pilot itself will determine if the trainees have learned what the objectives called for.
- A detailed "redline" copy will identify changes which must be incorporated.

STEP 7: FINALIZE LESSON TOPIC/LP

Revise and prepare the final versions of the instructor, trainee, and all support materials, including tests and IMM. Volume III of this manual and NAVEDTRA 135 (series) describe the procedures for implementing the final material.

STAGE THREE

CHAPTER 7

TRAINEE GUIDE

INTRODUCTION

Whatever the subject being taught, the curriculum developer is responsible for assisting the instructor and the trainees in using their time efficiently while developing the skills, knowledge, and attitudes essential to effective performance in the Fleet. The curriculum developers incorporate their skills, knowledge, and understanding of the subject matter into an instructional strategy in order to best present the material effectively and achieve stated objectives. To ensure uniform coverage of the material, the Lesson Plan (LP) is developed to guide and direct the instructor.

Through the use of various aids, the curriculum developer directs the trainees to supplementary material, structures their note taking, replaces abstract ideas with concrete images, and may provide trainees with the opportunity to apply their newly acquired skills and knowledge. Development of Instruction Sheets and the Trainee Guide (TG) are covered in this chapter. A TG leads the trainee through the course just as the Lesson Plan Guides the instructor.

> Development of the LP, TG, and Tests, to a large extent, occurs simultaneously. That is, as you are creating an LP, TG, or Test you are shifting back and forth to the other two as good ideas come to mind. Hence, it is important to read all three chapters before attempting to develop either a LP, TG, or Test.

SCOPE

- Describe the content guidelines for a TG.
- Provide a step-by-step procedure for developing Instruction Sheets/TG.

> ### COURSE MODIFICATIONS
>
> Training materials and modifications are discussed in Volume III, Chapter 9.
>
> Identification of TG elements/pages affected by a revision modification are discussed in the chapter under training materials and modification.

SECTION 1 - TRAINEE GUIDE

* Is the primary trainee material
* Contains knowledge and skill objectives the trainee is to attain upon successful completion of the course
* May provide an outline of instruction

> This manual establishes the minimum requirements for each of the elements of each Instruction Sheet. It does not specify exact formats, such as, line counts. Samples of Instruction Sheets which meet the minimum content requirements and provide acceptable formats, are provided in Volume II, Tab A-6 of this manual.

SECTION 2 - ELEMENTS OF THE TRAINEE GUIDE

The TG, as shown in Figure 7-1, consists of the following:

* Front Matter
* Instruction Sheets

> Occasionally, both individual Instruction Sheets and a TG will be used due to security requirements or changes in equipment or procedures.
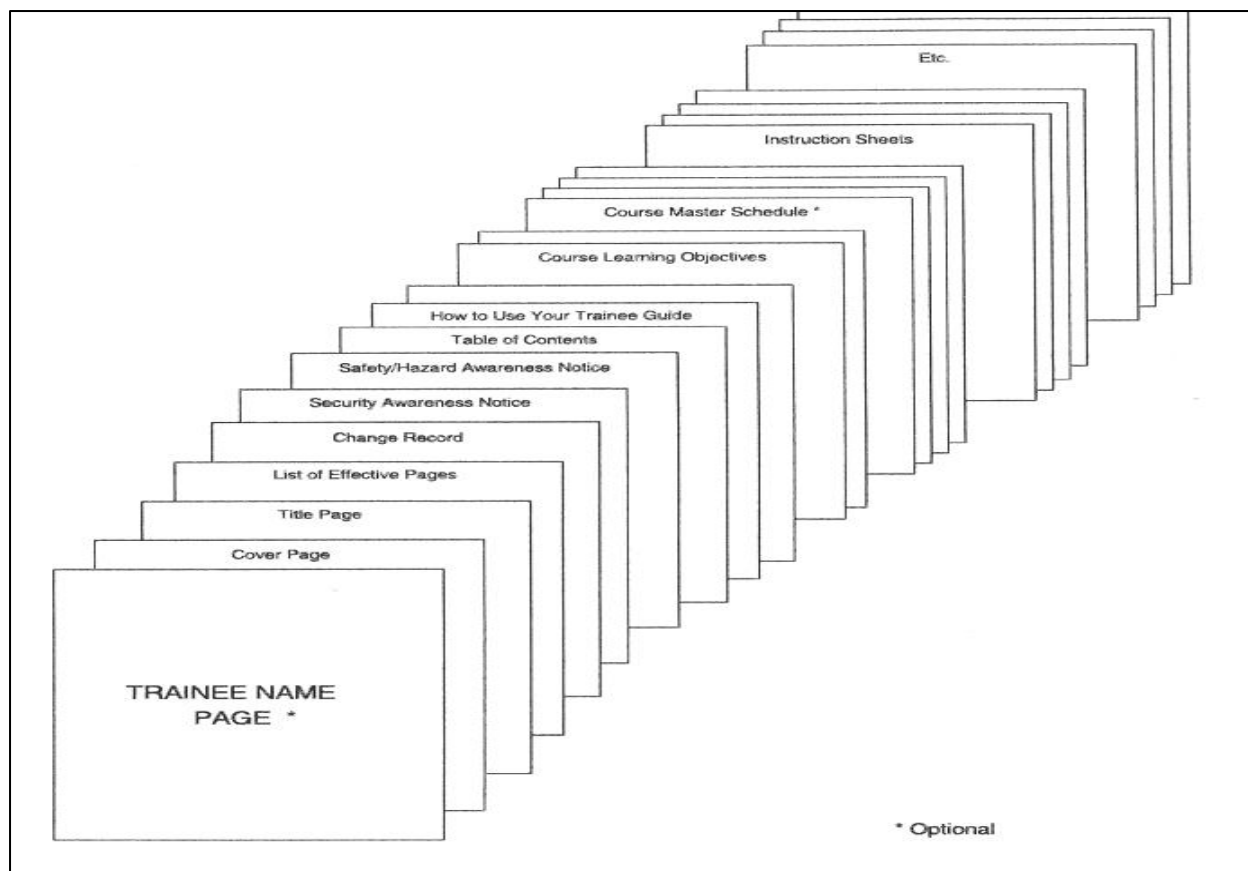
FIGURE 7-1:   TRAINEE GUIDE ORGANIZATION

2.1.   Front Matter:

- The front matter of the TG consists of the following
  elements:

  - Trainee Name Page (Optional)
  - Cover (Optional)
  - Title Page
  - Change Record
  - Table of Contents Page(s)
  - Security Awareness Notice Page(s)
  - Safety/Hazard Awareness Notice Page(s)
  - How To Use Your TG Page(s)
  - Terminal Objectives Page(s)
  - Course Master Schedule (Optional)

- TRAINEE NAME PAGE:

  - Is optional at the Course Curriculum Model Manager
    (CCMM) or the Curriculum Control Authority (CCA)
    direction

- Is used to track copies or to hold a trainee accountable for the TG
- If required, the Trainee Name Page provides space to record:

  - Between five and ten trainee names
  - Class number

- Each volume of the TG may have a Trainee Name Page or only those volumes which must be controlled.

- **COVER PAGE**

  - It is optional at the CCMM's or the CCA's direction
  - If required, the Cover contains:

    - The phrase TG for
    - Course title
    - Course Identification Number (CIN)
    - Security classification (if applicable)
    - CCMM's name and address
    - CCA's name and address
    - Date the TG was prepared
    - An identification seal such as the Navy seal, community logo, or a similar illustration may also be added.

  - Cover pages are printed on heavy paper stock or equivalent material

- **TITLE PAGE:**

  - Contains the phrase TG for
  - Course title
  - CIN
  - Revision number in alpha characters after the CIN (if required)
  - Change number in Arabic numbers after the CIN (if required)
  - Volume number if a multi-volume TG Security classification (if applicable)
  - Security classification (if applicable)
  - Trainee Name Block (Optional)
  - Name of CCA authorizing publication
  - Name of CCMM

- Month and year the TG was prepared. If a revision, the later date is placed in parentheses under the original promulgation date

- **CHANGE RECORD**

  - Under the heading Change Record, provide space for recording information related to each training material modification incorporated into the TG after it is approved for implementation.
  - The Change Record provides space to record:

    – Number and description of change
    – Person inserting the change
    – Date change entered

- **TABLE OF CONTENTS**

  - Under the heading Table of Contents, for a single volume TG, list:

    – Front Matter elements, such as, Change Record, Security Notice
    – Each Instruction Sheet by Unit and Lesson Topic number and complete Instruction Sheet title in the order they are used

  - Under the heading Table of Contents, for a multiple volume TG, list:

    – In the first volume, a complete listing of the contents of all volumes in the TG
    – The Table of Contents will not be listed as an entry. In subsequent volumes, list only the contents of the respective volume.

    > It is very unusual for the TG to be multiple volumes. If multiple volumes are required, it is usually because one volume is classified.

- **SECURITY AWARENESS NOTICE PAGE(S):**

  - States whether or not classified material is contained in the course.

- Describes procedures for handling and safeguarding classified materials in the course.

> Each TG shall bear the highest security classification demanded by its contents.

- Refer to the latest OPNAVINST 5510.1 (series) on Security Program Regulations to ensure that all training materials are marked and handled in accordance with the latest policy guidance.

> The Security Awareness Notice should be as individual as the course. This Notice does not relieve the developer from the responsibility of incorporating security requirements throughout the course.

- **SAFETY/HAZARD AWARENESS NOTICE PAGE(S):**

  - Under the heading Safety/Hazard Awareness Notice:

    - Identifies hazards to personnel and equipment
    - Identifies special directions to personnel concerning Safety
    - Provides safety precautions for the protection of personnel and equipment
    - Provides instructions for the reporting of workplace safety and hazard violations
    - Provides specific policy on Training Time Out (TTO)
    - Provides for designated High Risk Course policy on Drop on Request (DOR)

  - The developer should refer to NAVEDTRA 135 (series) and the latest NETCINST 5100.1 (series) on training safety to ensure that the latest policy guidance is incorporated in this section.

> The Safety/Hazard Awareness Notice should be as individual as the course. This Notice does not relieve the developer from the responsibility of incorporating safety throughout the course.

- **HOW TO USE YOUR TRAINEE GUIDE PAGE(S):**

  - These pages include a general description of the composition, function, and use of the Instruction Sheets and the TG.
  - Under the heading How To Use Your TG, discuss:

    - The types of Instruction Sheets contained in the TG
    - How to use the Instruction Sheets
    - The types of examinations and quizzes administered in the course
    - The course divisions

- **TOPIC LEARNING OBJECTIVES (TLOs) PAGE(S).** Under the heading, Topic Learning Objectives, list the topic objectives in numeric sequence.

  > TLOs will be consistent with the TCCD Outline of Instruction both in content and sequence.

- **COURSE MASTER SCHEDULE (CMS)**

  - CMS, for courses greater than one day, should be made available to each trainee as a handout, part of the TG, or posted in a conspicuous place.
  - If included in the TG, under the heading CMS:

    - List the Unit and Lesson Topics by number and title in instructional sequence by day and period
    - Indicate when tests will be administered and which Units/Lesson Topics will be covered

  - CMS in the TG usually is identical to the CMS prepared for the TCCD.

2.2. Instruction Sheets

- Instruction Sheets are organized by Units and Lesson Topics:

  - Instruction sheets include Outline, Assignment, Information, Job, Problem and Diagram Sheets.
  - Units and Lesson Topics are numbered according to the TCCD COI.

- Units and Lesson Topics are listed in the Table of Contents in the Front Matter for organizational purposes but there is no Unit or Lesson Topic Pages.
- Instruction Sheets are arranged according to the sequence in which they are used within the Lesson Topic they support.
- All Instruction Sheets are developed to support instructions as presented in the LP. All Instruction Sheets developed will be cited or assigned at some point in the Lesson Topic.

- Each Instruction Sheet has a running header:

  - The first line contains:

    – The phrase TG
    – CIN
    – Revision number in Alpha characters (if appropriate)
    – The phrase Change with number in Arabic numbers (if appropriate)
    – Volume number if a multi-volume TG
    – Security classification (if applicable)

  - The second line indicates, in the right corner, the number of pages composing the Instruction Sheet.

      EXAMPLE: Page 1 of 4

  - The third line is centered and includes the Instruction Sheet type and its number.

      EXAMPLE: Outline Sheet 4-10-6

> All Instruction Sheets should be marked "For Training Use Only" at either the top or bottom of the page. This is to preclude the instruction sheets being used in the work environment.

2.3. Outline Sheets:

- Are titled the same as the Lesson Topic in the LP
- Under the heading Introduction, has statements concerning the overall scope and content of the Lesson Topic
- Under the heading Topic Title, lists the topics

- They are identical to those listed on the topic page of the Lesson Topic

- Under the heading Topic Outline, presents an outline of the major points to be covered in the Lesson Topic

  - Only key words or phrases should be entered
  - More subheadings may be included than on the DDA page in the Lesson Topic

2.4. Assignment Sheets:

- Are titled so as to describe the subject matter of the sheet
- Under the heading Introduction, has statements concerning the overall scope and content of the assignment
- Under the heading Topic Titles, lists the topics:

  - They will be identical to those listed in the Lesson Topic in the LP.
  - If both an Outline Sheet and an Assignment Sheet are used to support a Lesson Topic, the Learning Objectives will be listed only on the Outline Sheet.

- Under the heading Study Assignment, list material to be studied by the trainee before the presentation of the next Lesson Topic. This can be given as a homework assignment:

  - Applicable documentation is identified by paragraph, page, figure, or diagram numbers.
  - Specific study instructions, including preferred sequence of study may be included.

- Under the heading Study Questions, lists questions which assess understanding of what was studied or tests ability to apply the information.

2.5. Information Sheets:

- Are titled so as to describe the subject matter of the sheet
- Under the heading Introduction, provides a general explanation of how or why an understanding of the covered material benefits the trainee

- Under the heading References, lists all publications used to develop the information section of the Information sheet: Each reference is listed by number, volume, part, and complete title
- Under the heading Information, provides:

  - Information sheets should not reproduce information contained in texts or references readily available at the level required for instructional purposes
  - Information written clearly and to a level consistent with the understanding of the trainee
  - Reference to technical manuals or other approved publications citing specific paragraphs, figures, tables, etc.
  - Information on new concepts

    EXAMPLE: Special integrated circuit components, unique symbols, terminology

  - Background information

    EXAMPLES: Transistors, magnetic amplifiers

  - Clarifying information

2.6. Problem Sheets:

- Are titled so as to describe the subject matter of the sheet
- Are normally used for paperwork troubleshooting when the equipment is not available
- Under the heading Problems, problems are presented which:

  - Are organized in any reasonable manner that promotes problem-solving abilities
  - Provide a clear statement of the problem(s), the conditions, and parameters affecting the problem(s)

- Under the heading Directions, the directions and procedures for the solution to the problem are provided
- Incorporate drawings/diagrams, if required, as part of the Problem Sheet, not as a Diagram Sheet

2.7. Job Sheets:

- Are titled so as to describe the subject matter of the sheet
- Under the heading Introduction, the purpose of the Job Sheet and trainee benefits are explained.
- Under the heading Equipment, a complete listing of all equipment required for use by the trainee to accomplish the job is provided. Reference to official documentation which lists the equipment may be substituted.
- Under the heading References, all publications required to perform the Job Sheet are listed. Each reference will fully identify the document by number, volume, part, and complete title.
- Under the heading Safety Precautions, state safety precautions that apply to the overall job. For example, in the Volume II Sample TG Job Sheets, Training Time Out procedures are reviewed. If there are no safety precautions related to the overall job, enter "Not Applicable" or "None".
- Under the heading Job Steps, procedures for performing operation, maintenance, troubleshooting, or repair of equipment are listed:

  - Will not duplicate the procedures listed in the reference
  - Will include specific safety precautions in the Job Steps unless they are called out in the supporting technical manuals/references and cited in the step
  - May consist of either general or discrete step-by-step procedures for performing tasks associated with a job
  - Provide sufficient space under each Job Step to record information

- Under the heading Self-Test Questions, or after individual Job Steps, questions are provided which:

  - Are easily understood, grammatically correct, and easily graded by the instructor
  - Are technically correct and have direct application to the task being performed
  - Require analysis and thought similar to that required in the actual job situation

> Administration of a performance test is
> accomplished by using an Administrator's Guide
> and Job Sheets. Chapter 8 will provide
> additional information on the Job Sheet and its
> use in performance tests

2.8. Diagram Sheets:

- Are titled so as to describe the subject matter of the
  sheet
- Under the heading Diagram, provides diagrams, schematics,
  or charts:

  - Organized in any reasonable manner to accomplish the
    Lesson Topic objectives
  - May range from foldout schematics or block diagrams to
    a simplified schematic
  - Should be large enough so the trainee can make
    pertinent notations

SECTION 3 - INSTRUCTION SHEETS NOT IN A TG

3.1. Instruction Sheets distributed separately:

- Will not have Front Matter: Security information or
  safety/hazard awareness information may be provided on an
  Information Sheet.
- Listed under training materials required
- Have the same content and form as those contained in a
  TG, except the following will be omitted from the running
  header:

  - Volume identification
  - The phrase TG

> Instruction Sheets and the TG are important parts of the
> total instructional package. As much thought and
> attention should go into them as into the LP.

SECTION 4 - TG SPECIFICATIONS

4.1. All TGs developed in accordance with this manual:

- Are oriented vertically (8 1/2" x 11") on standard paper.
  This is often referred to as portrait layout.

- Are organized into one or more volumes: Volume number will be included in the cover page between the title and CIN.

> Repeat all elements of the Front Matter for each volume, except for How to Use Your TG, Topic Learning Objectives, and Course Master Schedule.

- May be printed on one side of the page or back-to-back: The phrase "This page intentionally left blank" or similar phrase will not be required on blank pages unless all pages must be accounted for because of the classified nature of the TG material.
- Generally, a TG will be created when the number of Instruction Sheet pages exceeds the number of pages which would be required by the Front Matter.

- Number Front Matter pages:

  - Consecutively using Arabic numbers
  - Placing number in the lower right-hand corner of page
  - Do not place a number on the Trainee Name Page or the Cover
  - Do not place a number on the Title Page; although, the Title Page is counted in the numbering of the Front Matter as page 1.

- Each Instruction Sheet:

  - Is titled as to the type of Instruction Sheet
  - Is identified with a three - element number which relates the Instruction Sheet to the Unit - Lesson Topic in the LP it supports/supplements

    - First element - Unit number
    - Second element - Lesson Topic number
    - Third element - Sequence number within the Lesson Topic:

        EXAMPLE: Assignment Sheet 7-3-1

    - In this example, 7 is the Unit number, 3 is the Lesson Topic, and 1 is the sequence number

- Is page numbered consecutively within the Instruction Sheet in the format of "Page __ of__" on the second line of the running header?

SECTION 5 - TRAINING MATERIALS MODIFICATIONS

- If components of a TG (i.e., individual instruction sheets) are revised as part of a Revision, an alpha character starting with "A" for the first revision will follow the CIN on the title page and a new publication date will be shown in parentheses under the original publication date. The entire instruction sheet will be printed with the revised CIN. No entry will be made on the Change Record Page:

EXAMPLE: A-433-0023A

- If components of a TG are changed as part of a Change, the term Change, with a number starting with 1 for the first change, will follow the CIN on every page affected by the Change. All changes are entered on the Change Record Page:

EXAMPLE: A-433-0023 Change 1

- Interim and Technical Changes are entered by the instructor. The entry is noted on the Change Record Page. The CCMM will retain all Interim and Technical Changes for inclusion in later Revisions or Changes as appropriate
- Categories of training materials modifications are discussed in NETCINST 1510.1 (series)

SECTION 6 - TG/INSTRUCTION SHEET DEVELOPMENT

Some developers can use the content and format guidelines presented in the previous sections to develop a new or revised TG or individual Instruction Sheets. If a more structured approach is desired, the following five-step development plan will aid in development of a TG or Instruction Sheet.

- The five steps are:

  - Review the Lesson Topic and technical documentation
  - Select appropriate Instruction Sheet
  - Prepare initial Instruction Sheets/TG

- Conduct Pilot
- Finalize Instruction Sheets/TG

STEP 1: REVIEW THE LESSON TOPIC AND TECHNICAL DOCUMENTATION

- Review the Lesson Topic to determine the topic's:

  - Place in the course sequence
  - Course Learning Objectives
  - Instructional method

- Review the Technical Documentation to determine:

  - Information which should be provided to the trainee
  - Which reference material can be used in lieu of reproducing the information in the TG

  STEP 2: SELECT APPROPRIATE INSTRUCTION SHEET

- There are six types of Instruction Sheets:

  - Outline Sheet
  - Assignment Sheet
  - Information Sheet
  - Problem Sheet
  - Job Sheet
  - Diagram Sheet

- Use Instruction Sheets to provide:

  - Supplementary information needed to complete a course successfully
  - Information which is not available in reference publications at the level required for instructional purposes
  - Problems to complete or a series of steps to perform which call upon trainees to apply what they have learned
  - The most appropriate experience for the trainee

- All Instruction Sheets will comply with the requirements of OPNAVINST 5510.1 (series) for the marking and handling of classified material
- Outline Sheets:

- Provide the trainee with an outline of the major
  teaching points in the Lesson Topic
- Are consistent with the outline of the discussion
  points contained on the Lesson Topic DDA pages
- Allow the trainee to follow the progress of a Lesson
  Topic

- Assignment Sheets:

  - Simplify the trainee's search for relevant data
  - Prepare the trainee for future job tasks that require
    researching and locating data in technical manuals
    necessary for operational and maintenance purposes
  - Maximize the effectiveness of the trainee's study by
    providing clear statements of learning objectives and
    study questions

- Information Sheets:

  - Provide additional, amplifying, or background
    information essential to the trainee but absent from
    or not easily found in the technical manuals or other
    official documentation
  - Are useful for promoting or aiding the trainee's
    comprehension of technical manual materials

- Problem Sheets:

  - Present practical problems requiring analysis and
    decision-making similar to what trainees may encounter
    in their eventual job assignments
  - Engage the trainee in problem solving, emphasizing the
    fundamentals of logical thinking, and give practice in
    the application of knowledge to practical situations
  - Are used when the subject matter of a course requires
    the ability to solve a problem in a logical manner

  > A Problem Sheet is NOT to be used for testing, a
  > substitute for laboratory activity, or as a do
  > it-yourself training method.

- Job Sheets:

  - Direct the trainees in the step-by-step performance of
    a practical job that may be encountered in their
    eventual job assignment

- Provide a means for the trainee to apply knowledge obtained during instruction
- Do not contain any directions to the instructor
- Require the trainees to use the technical documentation in performing their task just as they would in their ultimate assignments

> Specific safety precautions rather than general safety precautions should be incorporated in the Job Sheet.

- Diagram Sheets:

  - Provide the trainee with copies of special course material such as diagrams, schematics, or illustrations
  - May depict a sketch the instructor will also draw on the board, IMM (such as a transparency), or any diagram or schematic the developers may deem important for trainee use

> Diagram Sheets are NOT to be provided where material exists in reference documentation and the use of that documentation will suffice.

STEP 3: PREPARE INITIAL INSTRUCTION SHEET/TG

- Prepare Instruction Sheet drafts which meet the Instruction Sheet format requirements

  - Use of electronic media in preparing the Instruction Sheets/TG is highly encouraged
  - Review CCA and CCMM requirements for the word processing program to be used, font size, and formats beyond those established in this manual

- Multiple types of Instruction Sheets may be used throughout a Lesson Topic as well as a course.
- Review printing and publications guidelines in NAVEDTRA 135 (series) to ensure compliance.
- Use classified material only when absolutely necessary. Review OPNAVINST 5510.1 (series) to ensure compliance with marking and handling requirements.

- Coordinate quality assurance assistance review with the learning standards office or the Quality Assurance Officer.
- Coordinate review of instructional materials by the CCA, if appropriate.
- Determine if Instruction Sheets should be distributed separately or bound in a TG.
- Determine quantity of Instruction Sheets used.
- If the number of Instruction Sheet pages would exceed the number of Front Matter pages, create a TG.
- Determine requirement to control classified material: TGs should be unclassified whenever possible. Classified Instruction Sheets should be issued when needed
- Determine frequency with which the material must be updated. Instruction Sheets which require frequent updates should not be bound in a TG.
- Volume III of this manual and NAVEDTRA 135 (series) provide specific guidance on the management of curriculum development.

> Steps 4 and 5 will occur after all instructional material has been developed.

STEP 4: CONDUCT PILOT

- Conduct a pilot for an entire course or a major segment of the course, usually at least one Unit in length. This process is discussed in Chapter 10 of this volume and in Volume III, Chapter 7.

  - Review material for correctness and completeness.
  - The pilot itself will determine if the trainees have learned what the objectives called for and use the Instruction Sheets as designed.
  - A detailed "red-lined" copy will identify changes which must be incorporated.

STEP 5: FINALIZE INSTRUCTION SHEETS/TG

- Revise and prepare the final versions of the instructor, trainee, and support materials including tests and instructional media.

  - Chapter 8 of Volume III provides specifics on finalizing the material.

- Volume III of this manual and NAVEDTRA 135 (series) will describe the procedures for implementing the final material.

STAGE THREE

CHAPTER 8

TESTS FOR MEASUREMENT OF TRAINEE ACHIEVEMENT

INTRODUCTION

As a curriculum developer, your responsibilities include establishing methods for determining how well the trainees have achieved the objectives. Practical work is one such method and includes lab assignments, homework, and in-class assignments.

Tests must be developed when a grade (either within-course or end-of-course) is to be assigned, or a trainee's course PASSING/FAILURE must be decided and recorded. This chapter will provide you with guidelines for designing and developing Performance and Knowledge Tests, based on the development and use of job sheets, test items, and tests.

In most cases, the information provided in this chapter will suffice for the design, development, and scoring (grading) of performance and knowledge tests. A series of three appendices is included at the end of this chapter for those who require additional information in these subject areas.

> Development of the LESSON PLAN (LP), Trainee Guide (TG), and Tests, to a large extent, occurs simultaneously. That is, as you are creating an LP, TG, or Test you are shifting back-and-forth to the other two as good ideas come to mind. Hence, it is important to read all three chapters before attempting to develop either an LP, TG, or Test.
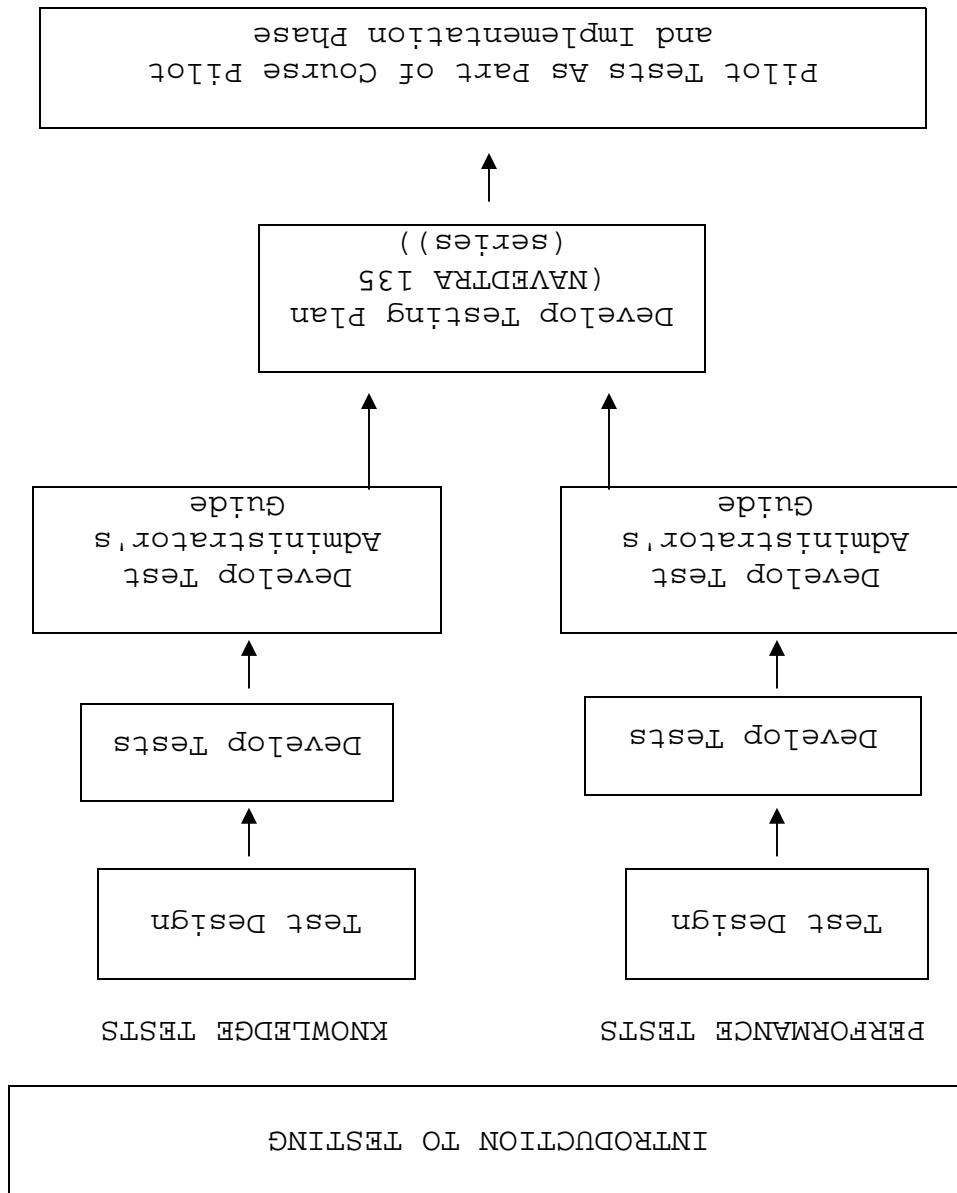
SCOPE

- To provide information on Test Development and Administration for those involved in developing Task Based Curriculum.
- The diagram below lays out the Testing process in the order that events should occur.

INTRODUCTION TO TESTING

PERFORMANCE TESTS	KNOWLEDGE TESTS
Test Design	Test Design
↓	↓
Develop Tests	Develop Tests
↓	↓
Develop Test Administrator's Guide	Develop Test Administrator's Guide

Develop Testing Plan (NAVEDTRA 135 (series))

↓

Pilot Tests As Part of Course Pilot and Implementation Phase

Figure 8-1: INTRODUCTION TO TESTING

SECTION 1 - INTRODUCTION TO TESTING

1.1. Definitions

● Tests are the primary tool for determining trainee attainment of the Course Learning Objectives (CLO)/Training Learning Objectives (TLO) and, therefore, his/her relative success in the course. Progress/Comprehensive tests are considered formal tests. Critical Learning Objectives (LO) are always formally tested. Less critical LOs may be formally tested or be tested.

informally measured by quizzes, homework assignments, or practical work.

- Performance tests measure a trainee's ability to perform a specific skill or behavior by using actual equipment or training devices.
- Knowledge tests are used to measure the trainee's achievement of theory and/or background knowledge in support of performance of a skill.
- Measurement is the process of assessing what the trainee has demonstrated by taking the Performance/Knowledge test.
- Evaluation is the process of comparing a measurement against an established standard.
- Grading is labeling (scoring) the evaluation, usually according to a level of success, e.g., go or no—go.

1.2. Required events for test development are:

- Design the Tests. Here decisions as to the What, When and How of testing will be determined.
- Develop the Performance Tests. Job Sheets will be developed and used as the basis for measuring trainee's ability to perform duties or tasks.
- Develop the Knowledge Tests. Decisions will be made as to where and what knowledge tests are required to measure trainee knowledge necessary to support the achievement of performance objectives.
- Develop Administrator's/Trainee Testing Information. Essential information will be developed for facilitating the administration of both Performance and Knowledge Tests

- Develop Testing Plan

> Testing Plan development is contained in NAVEDTRA 135 (series). A sample Testing Plan is provided in Volume II.

SECTION 2 - DESIGN PERFORMANCE TESTS

- During Performance Test Design you will decide what skills to test by selecting TLOs, how to test for these skills and when in the testing program to test for this knowledge.

- Of these two processes, test design and test development, test design is most important and effective tests seem to follow naturally from a good test design.

2.1. Performance Test Design requires that you determine:

- Criticality of each performance topic learning objective and level of acceptance. This process will help you to decide which performance objectives to measure through testing and which should be measured by practical work.
- Whether to use the actual equipment in the test situation or to simulate performance on the equipment may also be a factor

  - In many cases this decision will already have been made.
  - If not, see Addendum 8-A for guidance in deciding whether to test using the actual equipment or simulation.

2.2. Decide Which Performance LOs to Test

- Criticality of Skill:

  - Refers to how important the skill is in relation to its application to actual job performance

    - High: Skill is used during job performance
    - Moderate: Skill influences job performance
    - Low: Skill has little influence on job performance

- Other Criticality Factors

  > *Criticality* refers to a TLOs importance as related to the performance of a job task.

  - Safety to personnel/equipment — Critical tasks are those which are considered high risk or dangerous
  - Frequency of performance — The more often a task is performed the more critical it becomes
  - TLO's importance to the overall course mission
  - TLO's importance to on-the-job performance

- Rank order or group TLOs by category of criticality:

  - Rank ordering of TLOs consists of placing them in a list ranging from most critical to least critical. If

a course has 20 performance TLOs, rank them from 1
(most critical) to 20 (least critical).
- Group by categories of criticality—Establish 3 to 5
categories ranging from highly critical to least
critical.
- Highly critical TLOs must be formally tested. Less
critical TLOs may be informally tested by other means
such as practical work.

> Set a cut-off point between *most critical* and
> *least critical*. For instance: You decide that
> TLOs ranked in the upper 66 percent are most
> critical. They require formal testing. TLOs
> ranked in the lower 33 percent are less
> critical. Formal testing is not required.

- Performance Objective test guidelines. Those performance
objectives having the highest criticality rating must be
formally tested.

  - As a rule of thumb those performance objectives judged
  to rank in the upper one-third as to criticality
  should be tested by a Progress/Comprehensive
  Performance Test. This is formal testing.
  - Performance objectives judged to rank in the middle-
  to-lower one-third as to criticality should be tested
  by having the trainees complete job sheets in a
  laboratory as part of the application section of a
  Lesson Topic. This is informal testing, in that the
  performance evaluation lacks the controls of formal
  testing.
  - Performance objectives judged to rank in the middle-
  to-lower one-third as to criticality may also need to
  be tested to show the logic of the learning process.
  This can be accomplished by an informal quiz, or
  assigning problem sheets for evaluation.

- When you have completed this process you will have one
set of Performance TLOs from which to build the tests.

2.3. **Develop Performance Tests** components are:

- Job Sheets
- Job Sheet Evaluation Instruments
- Performance Test Administrator's Guide

2.4. **Develop Job Sheets**

- For specific guidance on developing job sheets see Chapter 7, TG, of this volume.
- Job Sheet problems must be consistent with those used during the course. They may not be used to introduce unfamiliar information.
- Each Job Sheet must require the trainee to use the technical documentation just as he will upon reaching his ultimate job assignment. Amplifying information may be incorporated into the job sheet to compensate for inadequate/incomplete technical documentation.
- Each Job Sheet must be directly related to either a skill CLO or a skill TLO.
- Job Sheets also provide a means for the trainee to apply knowledge obtained during instruction and therefore, be used in place of a knowledge test for the information.
- Each Job Sheet will support one of these test types: A product, a process, or product and process combined.
- Performance Test types are:

  - Product
  - Process
  - Combination (of Product and Process)

- Performance Test types explained

  - Product:

    – A product is an observable result—something you can see, hear or touch.
    – A solder joint is a product because it can be seen and touched.
    – A completed form is a product because it can be seen.

  - Product testing is possible when:

    – The objective specifies a product
    – The product can be measured as to the presence or absence of certain characteristics, e. g., does it look right, have the right texture, sound the way that it should?
    – Procedural steps may be performed in a different order or sequence without affecting the product.

  - Process. A process consists of step-by-step procedures required to produce a product or complete a task. Process testing is appropriate when:

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- The product and the process are the same thing—such as teaching a lesson
- There is a product, but safety, high cost, or other constraints prevent the product from being measured
- It is necessary to examine each step of the process in order to diagnose the reason for performance failure
- There may be a product, but there are critical points in the process which must be performed correctly because of the possibility of damage to personnel or equipment
- The objective specifies a sequence of steps that can be Observed
- The process does not result in a product
- Your interest is in the actual behavior itself

- Combination. His performance test is concerned with both an observable result, and the step-by-step process leading to the result.
- Combination testing is appropriate when:

  - Both product and process are equally important to the final result, or it is required so as to avoid hazards to personnel or equipment.
  - Safety considerations almost always dictate that the operation or maintenance of a device, i.e., the process, be done in a certain way. However, the outcome, i.e., the product, is just as important to successful job performance.

- Product/Process/Combination Learning Objectives Illustrated

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Product Objective: Construct a box sill floor frame to within 1/8-inch of required dimensions (The final product will be graded for conformity to the specifications).

Process Objective: Measure a crankshaft journal for wear, taper, and out-of-roundness (exact measurements require that the measuring process is followed precisely).

Combination Objective: Perform a Daily System Operating Test (DSOT) on the Close-In Weapons System—CIWS—(A systematic, step-by-step process must be followed to ensure a fully operational CIWS, or product).

8-8

- Deciding which Performance Test type to use:

  - Test for the product if the objective contains specific standards that the product must meet
  - Test for the process if the objective has specific standards that must be adhered to, including:

    - Safety procedures
    - Time standards
    - Requirements that the steps be performed in a certain order

  - Test for the process when diagnosis is important, i.e., if it is important to know when or where errors occur
  - If either process or product can be measured, select the one that is easiest to measure, using the following guidelines:

    - Time or number of personnel required to conduct the performance test
    - Can the product be tested without examining the process?
    - Can errors be made early in the process which might be costly or dangerous.

> See Addendum 8-A: In—Depth Discussion of Performance/Knowledge Test Design, at the end of this chapter, for more information on this topic.

2.5. Develop Job Sheet Evaluation Instruments:

- Evaluation Instruments may include:

  A Checklist

  AND/OR

  A Rating Scale for use in evaluating the correctness of the product or performance of the process.

  AND

  Grading Criteria (Scoring Guide) to be used in determining a grade for the product or process required by the Job Sheet.

Figure 8-2 and Figure 8-3, several pages
further on, show examples of a Job Sheet
Checklist and Job Sheet Rating Scale,
respectively.

Figure 8-3 and Figure 8-4, several pages
further on, show examples of Grading Criteria
for the above-listed Job Sheet Checklist and
Job Sheet Rating Scale.

- Guidelines For Developing:

  - Develop one checklist and/or rating scale, and grading
    criteria, for each step or group of steps on the Job
    Sheet
  - For Product Performance Tests:

    - When a product trait is either present or absent and
      can be measured by checking yes or no a checklist
      may be the best to use.
    - When product quality can vary from high to low,
      adequate to inadequate, good to bad, or some other
      range; a rating scale may be the best to use.
    - Whether a checklist or rating scale is chosen will
      depend upon the particular situation and the
      developer's discretion - some situations/developers
      might use a checklist; others might use a rating
      scale; sometimes using both might seem the most
      appropriate thing to do.

- For Process Performance tests:

  - When a step is either done or not done and can be
    measured by checking yes or no, a checklist may be the
    best to use.
  - When performance of a step can vary in quality from
    high to low, best to worst, good to bad, or some other
    range, a rating scale may be the best to use.
  - A rating scale may also be the best to use when a step
    has more than two possible outcomes.
  - Whether a rating scale or checklist is chosen will
    depend upon the particular situation and the
    developer's discretion - some situations/developers
    might use a checklist; others might use a rating
    scale; sometimes using both might seem the most
    appropriate thing to do.

- Grading Criteria (Scoring Guide)

  - This may be the most critical step in performance test development because it ensures standardized grading
  - The scoring guide contains a description of how each step or group of steps is to be graded
  - When using knowledge test-items in a performance test indicate the correct response and how many points will be deducted for an incorrect response
  - When knowledge test-items are included as part of a performance test they will not constitute a major portion of the trainees' overall grade.

> If you require more information about developing grading criteria, see Addendum 8—C: Grading Criteria for Performance Tests at the end of this chapter and NAVEDTRA 135 (series), Appendix B.

- **Evaluation Instrument selection**

  - It may make no difference whether a checklist or rating scale is used because almost all rating scales can be turned into checklists, and some checklists can be made into rating scales.
  - Grading criteria for the course is a factor:

    - If the course is graded SAT or UNSAT, a checklist may be the most appropriate to use.
    - If the course is graded with a numerical grade, a rating scale may be the most appropriate to use.

- **It is important:**

  - To define checklist steps and rating scale decisions as precisely as possible. The more precisely you can describe the behaviors the more effective the Job Sheet Checklist/Rating Scale will be.
  - To make the grading criteria for each Job Sheet Checklist and Job Sheet Rating Scale as precise as possible. This helps remove instructor subjectivity from the grading process.

- **Construct the Job Sheet Evaluation Instrument.** Each Checklist/Rating Scale/Grading Criteria should include, as appropriate:

  - A list of steps to be evaluated. This information comes from the related job sheet.

- When impossible to evaluate each step separately, review the job sheet and, where possible, group individual steps into like areas and evaluate them as one step.
- Each step or group of steps will be numbered.
- Briefly describe the evaluation procedures.
- Indicate the type of instrument.
- Indicate critical steps.
- Provide space for comments or description of errors.
- Include space for required administrative information e.g., name, abbreviated Social Security Number, class, beginning and ending time, score, etc.
- Personal information consistent with Personal Identifiable Information (PII) directives.

```
+-----------------------------------------------------------------------+
|                        PERFORMANCE TEST                               |
|                   JOB SHEET 5-1-5 CHECKLIST                            |
|                                                                       |
| TITLE:  MEASURING A CRANKSHAFT JOURNAL                                 |
|                                                                       |
| TRAINEE NAME/RATING_____SSN_____  |
| INSTRUCTOR/EVALUATOR_____  |
| DATE_____ TIME STARTED_____TIME COMPLETED_____   |
|                                                                       |
|   Evaluation instructions:  This test evaluates procedures and use of |
| measuring tools.  Observe trainee-taking measurements indicated.      |
| Watch for correct application of tools, and ability to                |
| interpret/record tool readings.  Observe that student uses correct    |
| methods to move heavy parts.  If unsafe practices are observed, STOP  |
| THE TEST.                                                             |
|                                                                       |
|   All recorded measurements for this Job Sheet must be +/- .0001" of  |
| journal proof dimensions.  Mark each measurement as SAT or UNSAT.  If |
| UNSAT, comment as to why.                                             |
|                                                                       |
| 1.  Measure and record outer end of journal                           |
|                                                                       |
|     a.  Vertical dimension                            (SAT) (UNSAT)   |
|                                                                       |
|     b.  Horizontal dimension                          (SAT) (UNSAT)   |
|                                                                       |
| Comment:_____   |
|                                                                       |
|  2.  Measure and record center of journal                             |
|                                                                       |
|     a.  Vertical dimension                            (SAT) (UNSAT)   |
|                                                                       |
|     b.  Horizontal dimension                          (SAT) (UNSAT)   |
|                                                                       |
| Comment:_____   |
|                                                                       |
| 3.  Measure and record inner end of journal                           |
|                                                                       |
|     a.  Vertical dimension                            (SAT) (UNSAT)   |
|                                                                       |
|     b.  Horizontal dimension                          (SAT) (UNSAT)   |
|                                                                       |
| Comment:_____    |
|                                                                       |
+-----------------------------------------------------------------------+
```

FIGURE 8-2: SAMPLE PERFORMANCE TEST CHECKLIST

```
          PERFORMANCE TEST
    JOB SHEET 5-1-5 GRADING CRITERIA


TITLE:  Measuring a Crankshaft Journal


  Grading Criteria for Job Sheet 5-1-5 is "SAT/UNSAT".
There is no product created by the trainee during this
performance test.  The sequence in which measurements are
taken during the test is not as important as the correct use
of measuring tools, accuracy of the measurements and
interpretation of tool readings.


  A numeric score is derived from the following:


  All trainees start the test with 100 points.


  Ten points are deducted for any recorded measurement that
exceeds journal proof dimensions by +/- .0001" and results
in an UNSAT for that measurement.  Comments to aid
remediation are required for each UNSAT marked.


   A score of 80 points or above is SATISFACTORY completion
of the test.


  Procedures:  Steps 1, 2, and 3 relate to measurement
techniques, tool reading, and safe practices.  Three or more
incorrect readings results in failure of the test.  Safe
practices are mandated.  If unsafe practices are observed,
the instructor has two options:


  1.  Interrupt the test and correct the trainee.  Make
appropriate comment on Job Sheet check list.


  2.  If safety violation warrants; STOP THE TEST, AND
PROCEED IN ACCORDANCE WITH SCHOOL DIRECTIVES.  This results
in immediate test failure.
```

FIGURE 8-3: SAMPLE PERFORMANCE TEST GRADING CRITERIA

```
                    PERFORMANCE TEST
              JOB SHEET 10-3-2 RATING SCALE
          TITLE:  CONSTRUCT A BOX SILL FLOOR FRAME

TRAINEE NAME/RATING _____SSN_____
INSTRUCTOR/EVALUATOR_____
DATE_____ TIME STARTED_____TIME COMPLETED_____


Item No.   Step/Description/Observation                         Deduct


1.  Marked and cut all sill plates squarely to
proper length within 1/8 inch                                 0,-5,-10


2.  Installed sill plates within 1/8 inch of
Specified location, ensuring they are square and
Level                                                         0,-5,-10


3.  Laid out header joists for floor joists 16" on
center, within 1/8 inch                                       0,-5,-10


4.  Measured, marked, and squarely cut each joist to
specified length, within 1/8 inch                             0,-5,-10


5.  Aligned header and floor joists (Crown up) within
1/8 inch of specified locations and height                    0,-5,-10


6.  Snapped chalkline across floor joists on centerline
of building, within 1/8 inch                                  0,-5,-10


7.  Placed and secured bridging staggered 1 1/2 inch
Off center, within 1/8 inch                                   0,-5,-10


8.  Installed subfloor with joists staggered and
Butted tightly on center of the joists driven flush
with the surface                                              0,-5,-10


9.  Subfloor nailed 8 inch on center, with nails
driven flush with the surface                                 0,-5,-10


10.  Used all tools and materials properly            0,-5,-10


Critical OBSERVED ALL SAFETY PRECAUTIONS                        -10
Evaluation Procedure:  Observe trainee during construction.
Comment on safety observance and use of tools, as appropriate.
Take measurements upon completion of project, and grade in
accordance with Job Sheet 10-3-1 Grading Criteria.
```

FIGURE 8-4: PERFORMANCE TEST RATING SCALE

```
                    PERFORMANCE TEST
         JOB SHEET 10-3-2 GRADING CRITERIA
        TITLE:  CONSTRUCT A BOX SILL FLOOR FRAME


Grading Criteria is SAT/UNSAT, based on a numerical
threshold.  A numeric value must be assigned to each
evaluated step.

  A safety violation will stop the performance test and
the Administrator will immediately provide remediation.
Safety violations that may have led to injury or damage
to equipment will result in an UNSAT performance and
failure of the Test.

  Any product dimension within 1/8 inch of specification
= -0 points.

  Any product dimension 3/16 inch out of specification
= -5 points.

  Any product dimension more than 3/16 inch out of
specification = -10 points.

  Each noted occurrence of improper tool usage = -5
points.

* = Critical step.

All students start with 100 points.  Minimum passing
score is 75 points.
```

FIGURE 8-5: SAMPLE GRADING CRITERIA FOR A RATING SCALE

2.6. Develop Performance Test Administrator's Guide:

- **Develop Instructions to the Trainee, including** (see
  figure 8-5 for an example):

  - A description of the test
  - Safety precautions which must be observed with
    specific warnings about any unusual conditions that
    exist
  - An explanation of the job steps to be performed and
    exactly what the trainee is required to do
  - The level of assistance permitted

- Information on how the grade will be determined, including a list of the critical steps which may result in mandatory failure of the test
- A list of tools, test equipment, and training material
- Allocated time limit and importance of time to test grade
- Relationship of the test to the performance objective

INSTRUCTIONS TO THE TRAINEE

1. Present the following to the trainee:

   a. This is a performance test for the _____. The test will consist of _____ tasks, and you will have _____ amount of time to complete the test. Prior to the beginning of each task, you will be given an explanation of the task, what to do and the time limit for each.

   b. All test equipment, tools, and materials are available to you. You must determine what is needed for each task.

   c. You may be required to leave the area after each task if additional preparation is required for the next task.

   d. You will be evaluated on your performance and your practice of safety precautions. The administrator will intervene to prevent or correct a violation of any safety precaution.

   e. You will not be assisted with your performance. The administrator may intervene after a task begins in order to correct a critical procedural error.

   f. The requirements may be restated or explained at your request. Do your best. If you cannot perform the task, inform the administrator.

   g. You will be observed closely. Try not to let this interfere with performance. All critical steps must be performed correctly. Some steps will be scored on a "Yes/No" basis and some will be scored with a rating scale.

2. Ensure that the trainee understands all of the above items before proceeding to the first problem.

FIGURE 8-6: SAMPLE TEST ADMINISTRATOR'S GUIDE INSTRUCTIONS TO THE TRAINEE

- Develop Instructions to the Administrator (see figure 8-6 for an example), including:

  - A brief description of the task to be performed
  - A list of required tools, test equipment, and training material
  - Specific instructions describing how to set up the equipment/job performance
  - Instructions on any special safety precautions/procedures that may be applicable
  - Instructions on the use of knowledge test-items (written and/or oral)
  - Guidance on the actions to be taken in the event that the trainee does not perform as anticipated e.g. If a critical step is improperly performed, remediation and retesting are in order.

```
        INSTRUCTIONS TO THE ADMINISTRATOR

1.  The trainee will be performing the _____ task(s).
The following tools and test equipment are required:

    a.
    b.
    c.
    d.

2.  Preset the following controls on the _____.

    a.
    b.
    c.
    d.
    e.  Remove part no.____from the_____ and replace with
faulted part.

3.  State the following special procedures to the
trainee:

    a.  Briefly describe the task and its relationship to
the objective.
    b.  State any special safety precautions/procedures
that may be applicable.
    c.  Provide additional information specific to the
test.
    d.  Orally quiz student on applicable safety
precautions using questions from the evaluation
checklist.
    e.  If the trainee fails a critical step remediate by
_____.
```

FIGURE 8-7: SAMPLE INSTRUCTIONS FOR THE ADMINISTRATOR

```
This concludes the discussion on Performance
Test Design/Development.  Remember, if you
need more information see Addendum 8-A on
Performance Test Design/Development.
```

SECTION 3 - DESIGN KNOWLEDGE TESTS

- During Knowledge Test Design you will decide what
  Knowledge to test by selecting TLOs, how to test for this
  knowledge and when in the testing program to test for
  this knowledge.

- Of these two processes, test design and test development, test design is most important and effective tests seem to follow naturally from a good test design.

3.1. Knowledge Test Design requires that you determine:

- Level of learning required of each knowledge TLO

  - This process requires you to examine how the knowledge will be used on-the-job and to design the test accordingly.
  - For instance, if instantaneous total recall to a situation is necessary (such as the proper response to an incoming Exocet Missile) your test must require the trainee to answer from memory - you could hardly give the trainee the time to locate the answer in the technical documentation.
  - If, on the other hand, a procedure will always be performed using the technical documentation then your test must allow the trainee access to this documentation.

- Criticality of each knowledge topic learning objective. This process ensures that knowledge deemed critical is measured over other, less important knowledge.

3.2. Decide Which Knowledge TLOs To Test: The Level of Learning is determined by:

- The conditions, behavior, and standards specified in each objective
- It is very important that you know how the information being taught will be used on the job and then test for the information at that level which it will be used
- Following are the different ways (or levels of learning) in which knowledge is used on the job:

      K1 – Recognize
      K2 – Recall
      K3 – Comprehend
      K4 – Apply
      K5 - Analyze/Synthesize/Evaluate

- Each piece of information used on the job will be used at one of these levels.
- It is absolutely imperative that the level chosen for construction of the knowledge test item match the level at which the corresponding information is used on the

job. Therefore, if your analysis determines that the information is used at the application level on the job then the corresponding test item must be at the application level.

- The levels of learning are described as follows:

  - K1 – Recognize. Recognition is the process of verbatim identification of specific terms, facts, rules, methods, principles, procedures, objects, etc., that have been presented during training. The information to be identified is selected from two or more alternatives.

  EXAMPLE: Identify a particular switch on a piece of equipment by matching its name to a diagram of the switch.

  - K2 – Recall. Recall is the verbatim remembering of specific terms, facts, rules, etc. In answering a recall test item, the trainee remembers and responds exactly as taught. For a recall test item, the trainee responds from memory instead of selecting the response from two or more alternatives. Recall is tested with closed book tests; otherwise the trainee's ability to remember information is not tested and the item becomes a recognition item.

  EXAMPLE: List the steps of an emergency procedure.

  - K3 – Comprehend. Comprehension understands what was taught rather than simply memorizing the words. It can be demonstrated by interpreting, explaining, translating, or summarizing information. When measuring the trainee's understanding of an objective, verbatim recall or recognition must be avoided. This requires the developer to paraphrase the material presented rather than taking it word for word from the text.

  EXAMPLE: Explain orally how a steam turbine works.

  - K4 - Apply. Application involves the ability to use acquired knowledge in a situation not specifically demonstrated during instruction, but job related. Application questions require trainees to demonstrate knowledge through mental skill exercises. The test items must be different than those used in class to be considered application. If the problem is exactly the

same the trainee may be memorizing the problem and the item becomes a recall item.

EXAMPLE: Determine resistance values from circuit diagrams.

- K5 – Analyze/Synthesize/Evaluate. Analysis involves the understanding of the elements of data and relationships among the data that make meaning of information explicit. Synthesis is the ability to put parts together to form new patterns or structures such as a unique communication, a plan of operations, or a set of abstract relations. Evaluation involves the judgments of the value or effectiveness of procedures or solutions based on data, criteria and standards.

EXAMPLE: Determine the best method for stowing ammunition on a ship.

- Criticality of Knowledge: Refers to how important the knowledge is in relation to its application to actual job performance.

  - High: Knowledge is used during job performance
  - Moderate: Knowledge influences job performance
  - Low: Knowledge has little influence on job performance

- Other Criticality Factors Knowledge Applies To:

  > Criticality refers to a TLOs importance as related to the performance of a job.

  - Safety to personnel/equipment. Critical tasks are those which are considered high risk or dangerous
  - Frequency of performance. The more often a task is performed the more critical it becomes
  - TLOs importance to the overall course mission
  - TLOs importance to on-the-job performance

- Rank order or group TLOs by category of criticality:

  - Rank ordering of TLOs consists of placing them in a list ranging from most critical to least critical — A course has 20 knowledge TLOs. Rank them from 1 (most critical) to 20 (least critical).

- Group by categories of criticality. Establish 3 to 5 categories ranging from highly critical to least critical.
- Highly critical TLOs must be formally tested. Less critical TLOs may be informally tested by other means such as graded homework or problem sheets.

> Set a cut-off point between most critical and least critical. For instance: You decide that TLOs ranked in the upper 66 percent are most critical. They require formal testing. TLOs ranked in the lower 33 percent are less critical. Formal testing is not required.

- Knowledge Objective test guidelines. Those knowledge objectives having the highest criticality rating must be formally tested.

  - As a rule of thumb those knowledge objectives judged to rank in the upper one-third as to criticality should be tested by a Progress/Comprehensive Knowledge Test. This is formal testing.
  - Knowledge objectives judged to rank in the middle-to lower one-third as to criticality may tested by having trainees answer questions on Job Sheets or other instruction sheets, such as Assignment Sheets. This is informal testing, in that the performance evaluation lacks the controls of formal testing.
  - Knowledge objectives judged to rank in the middle-to-lower one-third as to criticality may also need to be tested to show the *logic* of the learning process. This can be accomplished by an informal quiz, or assigning problem sheets for evaluation.
  - When completed, you will have one set of Knowledge TLOs from which to build the tests.

NOTE

See Addendum 8—B for an in-depth discussion of knowledge test designs.

3.3. Develop Knowledge Tests

- Knowledge Test components are:

  - Knowledge Test Booklets
  - Knowledge Test Administrator's Guide

- Knowledge Test Item Formats are:

  - Multiple Choices
  - True-False
  - Matching
  - Completion (e.g., labeling, short answer)
  - Essay

- Test item construction:

  - Multiple—Choice:

    - Have a stem containing the problem statement
    - A closed stem may either be written as a complete statement or as an incomplete statement
    - An open stem is an incomplete statement with the response positioned at the end of the statement
    - The EXCEPT format is not recommended but may be used in the stem if the word is capitalized or underlined
    - A list of possible answers (alternatives) which complete the stem or fill-in-the-blank within the stem

  - True—False: Consists of a direct statement and either a true/false or a yes/no alternative
  - Matching: Consists of directions to inform the trainee how to match the listed items. Normally has two columns listed below the directions with the questions/stimuli placed in the left-hand column and, answers/responses placed in the right-hand column.
  - Completion:

    - These consist of incomplete statements, containing a Blank to be filled in. The missing segment is an important part of the statement such as the key element of a process, an item of equipment
    - The response is positioned at or near the end of the incomplete statement
    - May also include diagrams with certain items in the diagram either highlighted or otherwise marked, with space provided for the response

  - Essay: Must state clearly and precisely what type of response is required

NOTE

See Addendum 8—B for an in-depth discussion of knowledge tests development.

3.4. Develop Knowledge Test Administrator's Guide

- Develop Test Booklet

  - The Test Booklet contains test items and a test answer key. It is constructed from the test item bank and serves as a guide for development of later alternate versions of the test.
  - Indicate how many points will be added for correct responses or deducted for an incorrect response.

- Develop Instructions to the Administrator

  > See Figure 8—8 for an example

  - Prior to the start of testing:

    - How to prepare the test area
    - Instructions for trainees
    - Time limit allowed for testing
    - Instructions for the administrator at test completion

  - At the completion of testing:

    - How to secure the test area
    - How to review, evaluate, or critique the test and record the test results

```
TEST INSTRUCTIONS FOR THE ADMINISTRATOR

1.  Prior to the start of testing:

    a.  Cover or remove all training aids that could
assist the trainee in answering test items.

    b.  Have trainees clear their desks of all unrelated
testing material.

    c.  Inform the trainees of the test time limit(s), if
any.

    d.  Provide pencils and scratch paper as necessary.

    e.  Read the test instructions to the trainees.

    f.  Provide reference documentation if applicable and
any instructions for its use.

    g.  Carry out any other local instructions as
necessary.

2.  At the completion of testing:

    a.  Collect and inventory all testing material.

    b.  Check test for marks made by the trainees.

    c.  Review the test with the trainees.

    d.  Evaluate any test items challenged by the
trainees.

    e.  Carry out any other local instructions as
necessary.
```

FIGURE 8-8: SAMPLE INSTRUCTIONS FOR THE ADMINISTRATOR

- Develop Test Instructions to the Trainee, including:

See Figure 8—9 for an example.

- How to fill out answer sheet administrative data
- The consequences of cheating

- How to handle the test answer sheets and test support materials

---

TEST INSTRUCTIONS TO THE TRAINEE

1. Print name, rating, rate, class number, and the date at the top of the answer sheet.

2. There will be no talking during the test nor are you permitted to leave your seat without permission. If you have a question, raise your hand and the administrator will come to you.

3. If you cheat during a test, your test booklet, answer sheet and all scratch paper will be confiscated. You will receive a zero as your grade. Disciplinary action will be taken.

4. Read each test item carefully. Choose the answer you believe to be correct. There is only one correct answer to every test item.

5. Darken the appropriate box on your answer sheet for each test item. If you wish to change your answer, circle the unwanted answer and darken in the appropriate box. (This instruction is included only when matching readable scoring sheets are used with true-false, multiple-choice and matching test items).

6. When you have finished the test, turn in the test booklet, answer sheet, and all scratch paper to the instructor. You may then quietly leave the room or remain at your seat while the proctor scores your answer sheet (if the test is not machine scored). There will be a complete review of the test.

7. If you have any questions regarding these instructions, notify the administrator immediately.

8. DO NOT WRITE OR MAKE ANY STRAY MARKS IN YOUR TEST BOOKLET.

FIGURE 8-9: SAMPLE KNOWLEDGE TEST INSTRUCTIONS TO THE TRAINEE

> This concludes the discussion on Knowledge Test
> Design/Development. Remember; if you need more
> information see the Addendum 8-B on Knowledge
> Test Design/Development.

- Develop Testing Plan:

  - The Testing Plan documents the test procedures for the
    course. A Testing Plan is required, but the content
    and format can vary. See NAVEDTRA 135 (series),
    chapter 5 for information on developing a Testing
    Plan.
  - A representative sample of a Testing Plan is provided
    in Volume II of this manual.

SECTION 4 - PUTTING IT ALL TOGETHER

So Far you have developed a variety of documents that are
associated with Testing and the Measurement of Trainee
Achievement. These documents should include the following:

- Performance Tests/Job Sheets
- Performance Test Administrator's Guide
- Knowledge Test Booklet
- Knowledge Test Administrator's Guide
- Performance/Knowledge Test Design (OPTIONAL)
- Testing Plan

> As you assemble each document, look at the
> related example in Volume II for required
> headings/information and overall document
> format.

4.1. Assemble Job Sheets: As per Chapter 7 and the volume II
example, plus:

- Security classification, if applicable, must appear on
  the page
- All knowledge test questions must meet the requirements
  for writing knowledge test questions

4.2. Assemble Performance Test Administrator's Guide: The
Guide consists of the following:

- Cover Page
- Instructions to the Administrator
- Evaluation Instrument

- Grading Criteria
- Instructions to the Trainee
- Performance Record Sheet

> This list of elements for the Administrator's Guide is comprehensive. They are not necessarily those elements, which must be applied to every performance test.

4.3. Cover Page: As per the volume II example, plus:

- Security classification if applicable — must appear on the page

4.4. Instructions to the Administrator: Provide, as appropriate:

- Consecutive page numbering beginning with Instructions to the Administrator
- A brief description of the task to be performed
- Instructions on any safety and other special precautions or procedures that may be applicable
- Required tools, test equipment, and training material including the Job Sheets by title and number
- Specific instructions describing how to set up the equipment or laboratory configuration
- Specific instructions on what assistance the administrator may provide or any special tasks, steps, or actions the administrator is to perform and when
- Instructions on the use of knowledge test-items (written and/or oral), if applicable
- Guidance on the actions to be taken in the event that the trainee does not perform as anticipated
- The allocated time limit for individual trainee tests and any effect time spent on the test has on the grade
- Directions on when to present Instructions to the Trainee

4.5. Evaluation Instrument: As per the volume II example, plus:

- List and number the steps, or groups of steps, to be evaluated. This list will be consistent with the related Job Sheet.
- Step Description describes the type of instrument — checklist or rating scale and which steps are critical.

- Description of errors describes the most common errors trainees might make in completing the step(s).

4.6. Grading Criteria: Provide a scoring guide that describes how each step or group of steps is to be graded.

4.7. Instructions to the Trainee: Describe, as appropriate:

- The test
- Safety precautions which must be observed, with specific warnings about any unusual conditions that exist
- An explanation of the job tasks to be performed and exactly what the trainee is required to do
- The level of assistance permitted
- Information on how the grade will be determined, including critical steps which may result in mandatory test failure
- Allocated time for the test and its importance to the trainee's test grade
- Relationship of the test to the performance objective being tested
- The consequences of cheating

4.8. Performance Record Sheet: Used for administrative information, e.g., Abbreviated Social Security Number, class number, beginning/ending test times, score, etc.

- If automated record keeping support is provided this sheet may not be required. See NAVEDTRA 135 (series).

NOTE

Student and Staff administrative records/files must be guarded with current PPI Directives.

SECTION 5 - ASSEMBLE KNOWLEDGE TEST BOOKLET

5.1. The Booklet includes:

- Cover Page
- Test Questions
- Answer Sheets
- All pages are numbered consecutively, following the cover

5.2. Cover Page: As per the volume II example, plus: Security classification, if applicable, must appear on the page.

5.3. Test Questions: All test questions should be numbered.

5.4. Answer Sheet:

- Not required if the trainees are to enter their answers in the Test Booklet
- Required if the Test Booklets are reusable

SECTION 6 - ASSEMBLE KNOWLEDGE TEST ADMINISTRATOR'S GUIDE

The Guide consists of the following:

- Consecutive page numbering beginning with Instructions to the Administrator
- Cover Page
- Instructions to the Administrator
- Evaluation Instrument
- Grading Criteria
- Instructions to the Trainee

> If all knowledge tests are administered alike only one Guide may be required. If each test or group of tests has unique requirements, additional Administrator's Guides may be required.

6.1. Cover Page: As per the Volume II example, plus Security classification, if applicable, must appear on the page.

6.2. Instructions to the Administrator: As per the volume II example, plus:

- Describe, for Prior to the Start of Testing, as appropriate.

  - How to prepare the test area
  - Instructions for trainees
  - Time limit allowed for testing
  - A list of required materials, including manuals, equipment (i.e., calculators) scratch paper and answer sheets

- Describe, for at the completion of testing, as appropriate.

  - How to secure the test area

- How to review, evaluate, or critique the test and record the test results

6.3. Evaluation Instrument: As per the Volume II example, plus:

- The answer key will be prepared at the time the test is developed and becomes part of the Administrator's Guide.

or

- When a test is generated by randomly selecting test items from a Test Bank immediately prior to test administration the answer key will be prepared at the same time.

6.4. Grading Criteria: This consists of a scoring guide to describe how each question/group of questions is graded.

6.5. Instructions to the Trainee:

- A description of the test
- Directions on how to fill out answer sheet's administrative data
- Correct handling of test answer sheets and test support materials
- The consequences of cheating
- Time allocated for the test and its importance to the test grade

SECTION 7 - ASSEMBLE TEST DESIGN

- Preparation and assembly of this document is <u>optional</u>, and at the discretion of the training activity.
- If criticality, level of learning and other criticality factors were arrived at by doing these tasks on paper, and/or other elements of the process were recorded as the decisions were being made, you may compile these documents as the Test Design.

SECTION 8 - ASSEMBLE TESTING PLAN

- See local directives for Testing Plan format and content requirements
- A representative Testing Plan is shown in Volume II

8.1. For additional guidance see the following ADDENDA:

- 8-A: PERFORMANCE/KNOWLEDGE TEST DESIGN
- 8-B: KNOWLEDGE TEST ITEM DEVELOPMENT
- 8-C: GRADING CRITERIA FOR PERFORMANCE TESTS

ADDENDUM 8-A

IN-DEPTH DISCUSSION

OF

PERFORMANCE/KNOWLEDGE TEST DESIGN

INTRODUCTION

Familiarity with the following terms associated with classification and types of tests will assist you in understanding this chapter.

- **Terms Associated with Developing Tests:**

<u>PERFORMANCE TYPES:</u>   <u>KNOWLEDGE TEST ITEMS:</u>

Process   Multiple Choice
Product   True-False
Combination   Matching Completion Essay

- **Terms Associated with Placement of Tests in the Course:**

PERFORMANCE TESTS/KNOWLEDGE TESTS
Pretest
Progress Test
Quiz
Within-Course Comprehensive Test
Comprehensive Test (Post-test)

SECTION 1 - TEST DESIGN

1.1. Test Design is the process of determining:

- What will be tested and to what learning level
- How it will be tested
- When it will be tested

1.2. The Process of Test Design requires that you:

- Determine objectives requiring formal testing
- Decide what you are testing for
- Determine appropriate type of test
- Determine test placement
- Classify each test
- General Guidelines for test administration
- Develop Performance Test types
- Develop Knowledge Test items

1.3. This is also the outline for this Addendum.

SECTION 2 - DETERMINE OBJECTIVES REQUIRING FORMAL TESTING

2.1. The following rules apply:

- All Learning Objectives (LO) must be measured
- Formal testing of Course Learning Objectives (CLOs) may be accomplished by:

    - Testing each CLO individually and none of its related Training Learning Objectives (TLOs)
    - Testing the TLOs which, as a group, equal the CLOs
    - Testing a CLO, or some part there of, and some of its supporting TLOs

- Any combination of the above during the course
- Informal measurement or testing of CLOs may be accomplished by:

    - Class work or homework assignment
    - Practical work supported by a Job Sheet
    - Informal quiz

- TLOs will be tested as necessary to ensure that the prerequisite skills/knowledge supporting the CLOs is being acquired.

2.2. When you have completed this process: You will have one set of Performance TLOs and one set of Knowledge TLOs from which to build the tests.

2.3. The next step in the process of test design is:

- To take each Performance TLO, one-by-one, and decide WHAT you will be testing for (a process or a product)
- When finished with these TLOs you will then take each of the Knowledge TLOs and, one-by-one, make a similar determination for them

SECTION 3 - DECIDE WHAT YOU ARE TESTING FOR

3.1. What you test for can be a:

- Process (Performance). Focus is on whether the trainee can correctly perform the steps of the procedure or process.

- Product (Performance). Focus is on whether the trainee can produce or construct a product that meets specifications.
- Combination (Performance). Focus is on both the correct performance of the procedural steps and construction of the product.

3.2. If operation/maintenance is to be taught: Most of the tests will probably be of the Process Type. This is because operation and maintenance revolves around the performance of step-by-step procedures.

3.3. If other duties/tasks are to be taught:

- Many of the tests will probably be of the Product Type. This is because many duties/tasks result in the making of a product. Yeoman and Personnel Specialists complete many different forms (products); Construction Electricians install electrical wiring and fixtures (products) and Builders construct buildings (products).
- Combinations (process and product) may also be prevalent. A Construction Mechanic overhauls an engine. The engine is the product but it is critical that an exacting process be followed in overhauling the engine.

SECTION 4 - SIMULATED OR ACTUAL EQUIPMENT PERFORMANCE

Performance Test Design also requires the developer to determine whether the trainee will demonstrate performance on the actual equipment or simulate equipment performance.

4.1. Use the actual equipment when: The objective requires product evaluation. Simulation cannot be used because simulated performance does not generate the same product as does real-world performance.

4.2. Simulation may be required when:

- The performance objective behavior, condition, or standard required for on-the-job performance cannot be performed in the training environment.
- Testing constraints, such as the following, make it impossible to test the task as it is performed on the job.

  - Lack of equipment
  - Insufficient instructor personnel

- Insufficient time for testing
- Risk to safety of personnel
- Risk of damage to equipment

4.3. Simulation may be desirable because:

- Simulation offers distinct advantages over actual
  equipment usage in the training environment, such as:

  - Simulation may make it possible to save time,
    equipment wear and tear, or personnel usage
  - Simulation may allow for more time to be spent on
    critical steps
  - Simulated performance may be accomplished in less than
    "real time"
  - Simulated performance may allow less critical steps or
    equipment start-up time to be skipped

- The simulator may allow more performance/diagnostic data
  to be recorded than can be obtained from real equipment.
- The simulator may allow "play back" so that trainees can
  critique their own performance.
- The simulator may allow for more standardization and
  control of the test situation.

> Through the process of Performance Test Design you
> should now be able to examine all Skill LOs of the
> course and determine those to be formally tested,
> those requiring informal testing, how each objective
> will be tested, and whether actual or simulated
> performance is most desirable.

4.4. Some of what you test for will likely be: Knowledge.
Focus is on whether the trainee has acquired the necessary
knowledge to do the process or product; understands the
associated safety/hazard precautions; can use the technical
documentation.

> In extreme situations, a knowledge test may be used in place of a product, process, or combination performance test. This is permissible only when facilities/equipment/material will not allow a performance test.
>
> However, it is permissible, and often desirable, to construct/administer a knowledge test that closely duplicates on paper performance of the process or construction of the product, or both.

4.5. When it comes to Knowledge Tests:

- WHAT will be greatly influenced by HOW the knowledge will be used on-the-job
- You must also identify what Knowledge is critical to on-the-job performance, and build the tests around this knowledge
- You should attempt to use a form of Knowledge Test that closely matches how the knowledge is used on-the-job
- You will achieve these goals by determining the appropriate type of test for each Knowledge TLO (you should have already done this for the Performance TLOs, but if you encountered difficulty this next section will help you)

SECTION 5 - DETERMINE APPROPRIATE TEST TYPE

5.1. Recall that the test types are:

- PERFORMANCE: Process—Product—Combination
- KNOWLEDGE: Multiple Choice—True—False—Matching—Completion—Essay

5.2. Factors to consider:

- Behavior/Condition specified in the objective
- Availability of equipment/training devices
- Space availability
- Number of trainees
- Time required administering the test
- Use/Adequacy of technical documentation
- Aided or unaided performance
- Individual, team, or group performance

- Philosophical considerations

SECTION 6 - DISCUSSION OF THE IMPORTANT FACTORS

6.1. Behavior/Condition specified in the objective:

- These indicate what is to be tested and Helps or Constraints (conditions) that will affect the test taker's performance
- You must decide how best to test for the objectives' Behavior/Condition. Your goal must be to match what is done on-the-job as closely as possible: Allow technical documentation use if done on-the-job; Test for knowledge of safety by recall/observance; Test for time if it is important on-the-job. Figure 8-A-1 provides guidance for matching behavior to the test and test item type.

Behavior	Performance	Multiple Choice	True-False	Matching	Completion	Essay
Product	X					
Process	X					
Combination	X					
Recognition		X	X	X		
Recall					X	X
Comprehension		X	X	X	X	X
Application		X	X	X	X	X
Analysis/ Synthesis/ Evaluation		X	X			X

FIGURE 8-A-1: BEHAVIOR TEST ITEM COMPARISON

6.2. Availability of equipment/training devices

- Performance may be impossible because the equipment, or a training device, is not available. Try to construct, on paper, test situations that allow a judgment to be made as to the trainee's ability to perform given the equipment. Paper troubleshooting problems and scenarios requiring written responses are particularly good. Better still, perhaps you can devise some means of simulating the desired performance. See the guidance presented earlier in this chapter.
- The number of training devices/equipment may be insufficient to allow for adequate practice, remediation, or testing. The suggestions given above apply here also.

In either case, performance cannot be as good as desired if the trainees cannot be given sufficient time for practice and remediation.

6.3. Space availability: Available space for performance testing is limited. You may not be able to conduct as many performance tests as desired. Simulation or pencil and paper performance tests can alleviate this situation to some degree.

6.4. Number of trainees: Design the tests to accommodate the expected maximum trainee loading.

6.5. Time required administering the test:

- Performance Tests should constitute the major portion of testing time, in the absence of any of the above constraints "major portion" means that the time devoted to performance testing falls within a range of 51 percent to 100 percent of testing time.
- Time required to set-up the test situation, time allocated for taking the test, reviewing and grading, should also be considered.
- However, the Course Master Schedule reflects only the time allocated for the trainee's taking and reviewing the test.

6.6. Adequacy of technical documentation

- All technical documentation must be reviewed by Subject Matter Experts (SMEs) to determine if it is adequate to support performance.
- When technical documentation is inadequate, missing information or incomplete steps must be prepared and incorporated into the job sheets, evaluation guide, as well as an Information Sheet.

6.7. Aided or unaided performance

- Analysis of each task will determine if the technical documentation must be available during the test—technical documentation should be provided if it will also be used during on-the-job performance of the task.
- Most performance objectives will require the use of the technical documentation during the test.

- When on-the-job performance of a task is without reference to technical documentation, the test must do likewise with the following provision regarding safety:

  - When trainee injury or equipment damage is a test possibility then prior to the test, a knowledge test must be given to ensure the procedural steps and safety precautions are committed to memory or his practice performance may be observed and a judgment made that the trainee is adequately prepared to take the performance test.

6.8. Individual, team, or group performance

- When the trainee's on-the-job performance will be as a member of a team, the test must require the trainee to perform as a member of a team.
- When the trainees must qualify at each position on the team, then they must be tested in each position.

6.9. Philosophical considerations

- There must be a definite and valid reason for giving a test. This applies particularly to knowledge tests.
- A test will not be given for the sake of giving a test. Valid reasons for giving a test, particularly knowledge, include:

  - To reduce the possibility of Trainee injury and/or equipment damage a knowledge test allows a judgment to be made that the trainee is adequately prepared for equipment performance
  - To make a judgment as to whether the trainee is adequately prepared for the job at their next duty station
  - For grading purposes, either final comprehension, or within the course
  - To assign rank order to a class of trainees
  - For motivational purposes
  - To ensure that trainees are doing/continue to do any homework assignments

SECTION 7 - DETERMINE TEST PLACEMENT

- During Course Master Schedule (CMS) development you made a best guess as to where tests would be administered in the course
- You should now be at this point in curriculum development:

  - Instructional sequence has been finalized
  - Lesson Topics have been developed
  - Allocation of instructional time for each lesson topic is firmed up (as much as it can be prior to conducting the pilot course)

- There are a number of questions (see below) you should ask about each Lesson Topic or the course in general.

Answering a question "yes" means a test is possible at that point in the course. When finished, you will have decided where to place each test in the course.

7.1. There are a number of questions (see below):

- Is there a need to determine what the trainee knows before presenting additional instruction?
- Is there a need to assess how well the trainee has learned the material just taught?
- Is there a need to determine if the trainee has acquired certain prerequisite skills or knowledge before being allowed to progress further in the course - particularly to the next Lesson Topic or go into a performance lab?
- Is there a need to determine that the trainee requires remedial instruction before being allowed to progress further in the course, or go to the laboratory?
- Is there a need to assess whether the material taught matches the objectives, especially the performance ones?

SECTION 8 - CLASSIFY EACH TEST

8.1. This requires that you decide each test's purpose:

- Pretest: Given at the beginning of the course or unit of instruction

  - May be used to accelerate the course or unit of instruction, see NAVEDTRA 135 (series)

- May be used to assess whether the trainee has the required prerequisite skills and knowledge needed to have a fair chance at passing the course
- May be used, in conjunction with a post test, to determine how much learning has taken place

- Progress Test: Given at different points within the course to assess trainee progress. Frequently administered at the completion of a group of Lesson Topics, or a particularly lengthy Lesson Topic.
- Quiz: A short test, often devised by the instructor and used to assess understanding of recently taught material. These tests, as a rule, are unscheduled and not part of the formal test program.
- Final Comprehensive Test: Given at the end of the course: Used to measure mastery of the LOs particularly the critical performance Los.
- Within-Course Comprehensive Test: Administered for longer courses when it is not practical to administer one final test

> See NAVEDTRA 135 (series), Appendix B, for further discussion of test classification and uses.

SECTION 9.0 - GENERAL GUIDELINES FOR TEST ADMINISTRATION

9.1. The following information, along with that already compiled: Will further assist you in deciding how much time to devote to Performance and Knowledge Testing, where to locate each test within the course, and the purpose of each test (pretest, progress, Post-test, etc.).

9.2. In general, the following guidelines should be followed:

- Some type of test should be administered about every 40-50 periods of instruction.
- More frequent testing is warranted if critical skills or knowledge must be assessed before new skills are taught.
- Less frequent testing is appropriate when the trainee must be given the time to develop skills which can only be attained by laboratory practice sessions, or if significant preparation outside the classroom is required for proficiency.

- Tests are usually developed to assess mastery of a group of Lesson Topics, but may cover a single Lesson Topic, especially if the topic is a lengthy one.
- Time allowed for the administration of knowledge tests is usually limited to 10 percent of total instructional time.
- All tests should be sequenced so that the trainee has sufficient time to study the material before the test, the minimum time provided should be at least one overnight period set aside for preparation.

SECTION 10 - DEVELOP PERFORMANCE TESTS/KNOWLEDGE TESTS

10.1. Performance tests are developed first

- Process Performance Tests: Measure well-defined steps which the trainee must integrate or sequentially perform for the process to be done correctly. They require the trainee to use a Job Sheet, and:

  - Demonstrate all important and essential steps and factors required for successful performance of the behavior
  - Comply with safety precautions
  - Utilize tools and equipment correctly
  - Perform all steps within a given time frame
  - Perform all steps while under the direct observation of the instructor

- Product Performance Tests: Place importance on the final product or result. They also require the trainee to use a Job Sheet. Examples are to:

  - Complete a form to be compared to a completed document
  - Build/make an item, the dimensions of which will be measured against a standard/tolerance
  - Build/make an item to perform a certain function
  - Assemble/connect equipment to perform a certain function
  - Finish the task within a given time

- Combined Product and Process Tests: Incorporate the requirements of each of the two types of tests described above.

10.2. Knowledge Tests are developed next

- Knowledge Tests: Measure the trainee's knowledge or comprehension of certain facts or procedural steps:

  - Trainee answers may be oral or in writing
  - The test items include: multiple-choice, true-false, matching, completion and essay items
  - Knowledge test items, written to test a particular Topic, are assembled into a Test Item Bank

10.3. Determine number of knowledge test items

- There is no established formula for determining the most appropriate number of test items required to test any given topic learning objective. However, the below-listed guidelines are factors to consider:

  - Criticality of the objective. When both critical and less critical objectives are measured on the same test the critical objective(s) should have more items to ensure that the test reflects the critical aspects of the course.
  - Instructional time allotted to present the material. For example, if the majority of the material covers one objective, then the majority of the tests items should cover that objective. This ensures that the emphasis on the test is the same as the emphasis in the classroom.
  - Complexity of the material. The more complex the material, the more test items required to ensure understanding.

10.4. Regardless of the type of question each will:

- Be keyed to the TLO that it measures
- Include the correct answer(s) and, when appropriate, the discussion points covered by the test question
- Be marked if a critical question

NOTE

Guidelines for developing knowledge test items are discussed in Addendum 8—B, which begins on the next page.

ADDENDUM 8-B

IN-DEPTH DISCUSSION

OF

KNOWLEDGE TEST DESIGN/DEVELOPMENT

SECTION 1 - KNOWLEDGE TESTS

1.1. Knowledge Tests are: Required to evaluate the trainee's ability to recognize, recall, or comprehend facts, procedures, rules, principles, or concepts that are required to perform a skill.

1.2. The following steps are required to develop knowledge tests:

- Determine level of learning required to test the objective.
- Refer to the number of test items required per objective, developed previously
- Develop knowledge test items:

  - Multiple Choice
  - True-False
  - Matching
  - Completion
  - Essay

- Oral versus written testing
- Ensure appropriateness of test items

SECTION 2 - REFER TO NUMBER OF TEST ITEMS REQUIRED

2.1. This step was completed earlier: But the information is needed now so you will know how many knowledge test items to develop for each objective.

2.2. Most of the remainder of this Addendum focuses on:

- How to develop each of the five most often used knowledge test item types, and a brief description as to the best use for each type of test item.
- Types of knowledge test items are:

  - Multiple Choice
  - True False
  - Matching
  - Completion
  - Essay

- Each type will be discussed in the order listed above.

SECTION 3 - DEVELOP MULTIPLE CHOICE KNOWLEDGE TEST ITEMS

3.1. The multiple choice test items are:

- The most versatile of all knowledge test item formats. It can be used to test for all levels of knowledge except recall.
- A cardinal rule in test item development is to communicate effectively. Otherwise, the trainee must guess at what the test writer is asking. Following the guidelines discussed in this section on multiple choice test writing will ensure effective communications between the trainee and test writer.

3.2. The multiple-choice test item consists of:

- A stem containing the problem statement
- A list of possible answers, or alternatives
- As a rule there are four alternatives, or possible answers, but depending upon the nature of the content being tested, there can be more than or fewer than four possible alternatives
- Only one alternative is the correct answer

3.3. General Guidelines for Stem Construction:

- The stem must include all information, conditions, assumptions, and details required to correctly answer the question without requiring the trainee to refer to the alternatives.
- The stem should be phrased positively instead of negatively. If a negative must be used, it should be highlighted (in caps or underlined) so that the trainee will notice it and interpret the item correctly.
- Wording in the stem should be clear and unambiguous, so that only one answer is correct.
- Words, phrases, etc., that pertain to all alternatives must be included in the stem rather than being repeated in the alternative.
- Information not essential to the interpretation of the test item must be omitted.
- If the test item uses an illustration on a separate sheet of paper, that illustration must be referenced in the stem by figure number.

- Test items in the form of questions must be complete sentences ending with a question mark.
- The completion position (blank) of an incomplete statement test item must be near or at the end of the stem.
- There should be only one completion position (blank) in a stem.
- Stems prepared in question forms are preferred over the incomplete statement form except when it would make the test item grammatically clumsy or difficult to understand.
- Test only one idea or central thought.

3.4. General Guidelines for Constructing Alternatives:

- The test item developer must exercise care when designing alternatives for the test items.
- Alternatives must be plausible but clearly incorrect and should fit well with the stem.
- The difficulty of the item will depend largely upon the alternatives.
- The more closely related the alternatives are, the more difficult it is for trainees to select the correct answer.
- A good rule is to develop alternatives based upon common misconceptions by trainees and inexperienced job incumbents.
- Alternatives may be prepared based on how trainees might incorrectly manipulate terms, symbols, etc.
- An additional rule is to look at the correct answer and determine how it may be made incorrect.

3.5. Specific Guidelines for Constructing Alternatives:

- The item must have only one correct answer.
- Alternatives should be closely related.
- Alternatives must be meaningful and not subject to automatic elimination by the trainees because they are irrelevant or unrelated to the question.
- Do not use interrelated answers, such as C is true if A and B are false.
- Use a vocabulary which is familiar or can be explained within the limits of the test item.

- All alternatives must be of approximately the same length and complexity.
- Do not use words such as always, never, etc.
- Do not use as alternatives—all of the above, none of the above.
- Express all alternatives in similar form.
- Avoid negative wording, which is confusing. However, if used, highlight negative wording by capitalizing, underlining or italicizing.
- Punctuation of alternatives must conform grammatically with the structure of the stem.
- When the stem is a question and the alternative is a complete sentence, begin the alternative with a capital letter and end it with a period.
- When the stem is a question and the alternative is an incomplete sentence, begin the alternative with a capital letter and end without a punctuation mark.
- When the stem is an incomplete sentence, with the response (blank) position at the end of the stem, begin the alternatives with lower case letters—except for proper nouns—and end with a period.
- When the stem is an incomplete sentence, each of the alternatives should be worded so that it forms a logical sentence when written into the incomplete position (blank).
- The position of the correct answer among the alternatives must be determined by a random selection process to avoid any patterns which may bias the test.
- For multiple-choice items that involve numerical answers the alternatives must be arranged in ascending or descending order.

3.6. Discussion of Types of Stems:

- Closed Stem: So-called because the stem begins with a capital letter and ends with a period or question mark; may take the form of:

  - Closed Stem as a Question
  - Closed Stem as an Incomplete Statement

- Open Stem: So-called because the stem is in the form of an incomplete statement with no ending punctuation (until the stem is completed by the alternative, which has the correct ending punctuation).

3.7. Examples of Closed Stem Test Items:

- Closed stem as a question:

  - Which of the following actions is required to remove a hinged type 2 module on the MTRE Mk 7 Mod 2/4?

    (a) Disconnect plates from the type 2 module
    (b) Insert "T" handle into quick release fasteners
    (c) Remove all Type 3 modules and connectors
    (d) Rotate hold down clamps to vertical position

- Advantages/Disadvantages to closed stem as a question:

  - The stem must clearly state the problem
  - The possibility of giving trainees grammatical clues is reduced
  - However, lengthier alternatives (responses) may be required

- Closed stem as an incomplete statement:

  - The setting of the AN/ABC-3Q flip-flop ___ indicates that intent-to-fire has been energized.

    (a) B43
    (b) C2l
    (c) C24
    (d) D32

- Advantages/Disadvantages to closed stem as an incomplete statement:

  - Note that the completion position appears within the stem and not at the end of the stem — also that seven ellipses (periods) are always used to indicate where the incomplete portion of the stem lies.
  - This type is easier to write than the closed stem as a question format.
  - This type encourages memorization and the taking of test items verbatim from the material — hence, use sparingly.

3.8. Example of Open Stem Test Item:

- When crimping both a stranded wire and a solid wire in the same contact, the solid wire's position in relation to the stranded wire is ___.

  (a) Above
  (b) Below
  (c) Beside
  (d) Diagonal

- Advantages/Disadvantages to open stem test items: Note that the response position is always at the end of the statement, and that each alternative provides a logical conclusion to the stem:

  - Open Stem items are easier to write than closed stem test items.
  - There is a tendency to avoid thinking about the question before the alternatives are developed, resulting in illogical and unrelated alternatives.
  - The less similar alternatives are in content the easier it becomes for trainees to select the correct alternative.

3.9. Formats for Multiple Choice Test Items:

- Standard Format: Use this format when you just want the trainee to select the correct answer from among the four alternatives provided.
- Except Format: Use this format when you want the trainee to recognize the correct alternatives and select the one, which is incorrect.

3.10. Example of Standard Format: This format is straightforward and easiest to develop.

- KNOWLEDGE TEST

3.11. Example of Except Format:

- A specific torque pattern and associated torque values can be found in the SINS technical manual for all of the following assemblies or components EXCEPT _____.

  (a) An azimuth synchro assembly mounted to the stem

(b) A velocity meter mounted to the platform

(c) A replacement gyroscope mounted to the stable platform

(d) A platform stem mounted to the bedplate

- The EXCEPT in the stem must always be capitalized, bolded, and underlined or italicized.
- Use this format sparingly.

3.12. Common Errors in Writing Multiple Choice Test Items:

- Using similar wording in both the stem and only the correct alternative. This suggests the correct answer.
- Example—error underlined:

  - What is the purpose of the MARDAN maintenance test set?

    (a) Monitors the C.P. operations
    (b) Furnishes power to MARANDA
    (c) Functions as a running time meter
    (d) Provides static <u>testing</u> of MARANDA

- Stating the correct alternative in greater detail than the other alternatives. This often cues the correct answer.
- Example—error underlined:

  - When all weapon power is removed from the PIP, which of the following statements is true?

    (a) All power is lost to the MCC equipment
    (b) The MCC equipment is furnished power from NAV via the MSR
    (c) The DCCs have heater power applied
    (d) <u>Power from the ship control center may be present in MCC since it only goes through the SHIP JP</u>

- Using two or more alternatives with the same meaning. This eliminates them as useful alternatives and simplifies the choice
- Example—error underlined:

  - What is the final step in performing post-maintenance checks?

(a) Secure the front panel to the chassis
    (b) Make sure the front panel is secure
    (c) Set manual test switch to "OFF"
    (d) Rerun the diagnostic tests

- Using alternatives that are included in other
  alternatives causes confusion for the trainee.
- Error underlined (note that alternative 2 includes
  alternative 1. Therefore, if alternative 2 is correct,
  then so is alternative 1):

  Example:

  What is the operating time, in seconds, for the
  pressurization/compensation blow valve to roll from shut
  to open?

      (a) 1 to 3
      (b) 1 to 4
      (c) 4 to 6
      (d) 9 to 11

SECTION 4 - DEVELOP TRUE-FALSE KNOWLEDGE TEST ITEMS

4.1. The true-false test item is:

- A two-response multiple-choice item that is used when
  only one plausible alternative to an item exists
- The true-false test item's primary drawback is its
  susceptibility to guessing. The trainee has a 50 percent
  chance of responding correctly even though he does not
  know the correct answer.
- True-false items may be written to test recognition,
  comprehension, application, or evaluation.

4.2. Format of true-false test items is straightforward:

- The stem is a direct statement
- The two alternatives are labeled a. True and b. False, or
  a. Yes and b. No, depending on whichever is most
  appropriate. See below:

  Example:

  When placing the CA in stowage, CA temperature must be
  normal prior to securing heater power.

a. True
b. False

4.3. Construction of True-False Test Items:

- The stem (descriptive statement) must include all relevant information required to correctly answer the item.
- The stem must be concise and clear — the proposition to be judged as true or false must be evident.
- The identification (TRUE/FALSE) must precede the descriptive statement, or stem.
- A false statement must be consistent with a commonly held misconception.
- Specific determiners, such as always, never, none, all, may, sometimes will not be used.
- Keep descriptive statements short. Long statements are harder to read and more difficult to judge true or false.
- When possible, state each item positively to minimize confusion.
- True-False test items will not be lifted verbatim from the curriculum.

4.4. This concludes the discussion: On developing true-false test items. Next we will discuss developing matching test items.

SECTION 5 - DEVELOP MATCHING KNOWLEDGE TEST ITEMS

5.1. Description and Use of matching test items

- The matching test form consists of two lists containing related words, phrases, or symbols.
- The trainee is required to match elements on one list with associated elements on the other list according to specific instructions.
- The trainee pairs the elements in each list and records the answer.
- Matching test items are ideal for testing recognition but may also be used to test comprehension and application.

5.2. Format for Constructing Matching Test Items

- The matching test item consists of directions and two columns listed below the directions stem.
- The directions explain how to match the items in the two columns.
- One column lists the questions or problems to be answered.
- The other column lists the answers. See below:

Example:

<u>DIRECTIONS</u>: Using the FCDs in OP 1324, MATCH the circuit element listed in column B to the signal that it generates (column A).

- Write the letter representing your answer in the blank to the left of each signal in column A. You may use a letter in column B once, more than once, or not at all.

COLUMN A	COLUMN B
1. ____DATA CHK NOT OK	a. Bl0
2. ____DATA CHK OF	b. B13
3. ____DRY RUN	c. B16
4. ____EQ CONT RST 2	d. B46
5. ____DATA CHK REQ	e. B49
6. ____DATA CJJK ALM	f. C30
	g. D56

5.3. Construction of Matching Test Items

- Stem directions must clearly describe how the trainees are to match the question and the answer.
- Questions are always placed in the left-hand column. Answers are always placed in the right-hand column.
- When possible, the answer list should consist of single words, numbers, codes, symbols, short phrases, etc.
- All answers should appear to be related to the questions to help prevent elimination of unrelated answers.
- Directions must state how often the answers may be used.
- Arrange the answers in a logical order.
- Place the entire matching test item on one page.

5.4. This concludes the discussion: On developing matching test items. Next we will discuss developing completion knowledge test items.

SECTION 6 - DEVELOP COMPLETION KNOWLEDGE TEST ITEMS

6.1. The completion test item is:

- A free response test item type that requires the trainee to provide the missing information from memory, as compared to the recognition of information as per multiple choice, true-false, and matching type test items.
- The completion test may also require the trainee to list a series of part names, procedural steps, etc., from memory.
- Another format of completion testing requires the labeling of a diagram from memory.

6.2. Advantages/Disadvantages of Completion Test Items:

- Guessing is minimized
- This type of test item is easy to construct
- Completion test items are useful in situations where trainees must write a computational equation, define terms, list part names and functions, etc.
- However, they are more difficult to score and must be accompanied by grading criteria

6.3. Formats of Completion Test Items:

- Complete a statement by providing the missing word or phrase:

  Example: The station clock and time display tests check performance of the individual stages of the register designated.......

- State a definition or computational formula or define a term in response to a question:

  Example: What is the name of the unit which detects angular motion and supplies an output through precession?

- List a series of procedures, steps, etc., from memory. This test item may be written as a question or statement:

Example: What are the steps in ordering DLR equipment?

6.4. Construction of Completion Test Items:

- Wording must be clear and comprehensive so that the trainee who is knowledgeable in the subject area can answer correctly.
- Missing segment of the incomplete statement must be important, such a key element of a process, piece of equipment, etc.
- Provide adequate space on the answer sheet for the response to be entered.
- Use a direct question to test for comprehension of technical terms or knowledge of definitions.
- Do not make the correct answer give away words, which may be guessed by those who do not really know the information.
- Also, avoid giving grammatical or other cues which may indicate the correct answer.
- Avoid using statements taken directly from the curriculum.
- Develop grading criteria which lists all acceptable answers.
- For incomplete statement test items:

  - Do not omit so many words that the statement becomes unclear, forcing trainees to guess.
  - Place the response position near, or at the end of the stem. A response position near the beginning is harder to read and takes longer to answer.

6.5. This concludes the discussion on: How to develop completion test items. Next, we will discuss essay test item development which is the last of the five types of knowledge items.

SECTION 7 - DEVELOP ESSAY KNOWLEDGE TEST ITEMS

7.1. Essay type test items:

- Require the trainee to answer a question with an original, written response
- Are useful for testing one's ability to organize data and express thoughts clearly in writing

- Require a relatively subjective scoring process since many factors may affect the correctness of a response
- Must be scored by someone knowledgeable in the subject area, unless there is only one possible response
- Are time consuming and difficult to score

7.2. Construction of Essay Test Items:

- An essay question is especially useful for assessing learning of a comparatively large body of information as well as individual elements within that body.
- The test item must state clearly and precisely the type of response that is required.
- Limits for the response must be identified by specifying the points to be addressed. Limits include length of response and time allowed to respond:

  Example: Compare and contrast gas turbine and 1200 PSI propulsion plants. Your discussion should include descriptions of the major components of each system. Partial credit will be given.

7.3. Essay Test Items are useful for:

- Comparison or contrast of items and procedures
- A decision for or against system or equipment operation
- Relationships such as causes and effects
- Illustration (sketch) of principles learned
- Statement of purpose in selecting a method or technique
- Criticism of the adequacy/correctness of a diagram or procedure
- Discussion of primary, alternate, and/or emergency procedures
- Explanation or definition of tasks
- Observation from illustration or operation
- Evaluation of the appropriateness of a procedure, technique, etc.

7.4. A Model Answer or Grading Criteria is required:

- When the grading criteria should list all essential data a knowledgeable trainee can be expected to provide
- When the model answer/grading criteria are used as the standard answer by which all other answers are scored

- When they set the weight (value) of each item or part of an item
- When to use oral tests and written tests follows

SECTION 8 - ORAL VERSUS WRITTEN TESTING

- Oral tests are best used when the trainee is exposed to this type of test on the job, such as propulsion engineering boards, safety reviews, and so forth. They are usually administered in a board type format with trainees responding to questions asked by a panel of evaluators.
- Written tests are of two types:

  - Open book tests evaluate a trainee's ability to locate and record information using technical documentation — they are used whenever the on-the-job situation requires the use of technical documentation.
  - Closed book tests are used when the knowledge being tested for is normally required on-the-job without reference to the technical documentation.

8.1. Factors may limit your choice of oral or written test:

- Trainee Instructor Ratio/Class Size: **Oral Tests are not recommended if the trainee/instructor ratio exceeds 10/1 or class size is over 20**, because of time constraints.
- Environmental Limitations: Written Tests are recommended when other trainees may overhear the test examiner or if there is excessive noise involved.
- Number and Format of Test Items: Written Tests are suggested if there are many test items or if they take the form of multiple choices or matching test items.

8.2. Next you will learn: How to determine if all of the many knowledge test items you have written meet standards for correctness.

SECTION 9 - ENSURE APPROPRIATENESS OF TEST ITEMS

9.1. SMEs should answer these questions for each test item:

- Is the item technically correct and is the correct response keyed?
- Does the item test the objective?

- Does the item test; knowledge critical to the task associated with the objective?
- Is the item written to the appropriate learning level?
- If recognition, recall, or comprehension of the knowledge being tested is required for competent performance on-the-job, is the item a closed-book item?
- If the knowledge being tested is normally looked up during performance of on-the-job task(s), is the item an open-book test and is the essential technical documentation furnished?
- Are all words spelled correctly, is the grammar correct, and does the item meet format construction guidelines?

9.2. If the answer is NO:

- To any of these questions, correct the discrepancy and try again to answer the question.
- Does each knowledge test item meets all criteria above it are approved for use in a knowledge test?

9.3. This finishes the discussion of this Addendum: Go to Addendum 8-C if you need to learn more about developing performance test grading criteria.

ADDENDUM 8-C

IN-DEPTH DISCUSSION

OF

GRADING CRITERIA FOR PERFORMANCE TEST

SECTION 1 - GRADING CRITERIA—PURPOSE

Grading criteria describe the standards by which the trainees will be measured and factors that will be considered in determining the trainee's grade on an individual performance or knowledge test/test item.

1.1. Use of grading criteria:

- They enable the instructor to determine whether or not an individual trainee, or team, has met the objective(s).
- Grading criteria provide for an unbiased and non-subjective evaluation of the trainee's ability with respect to a particular area of performance or knowledge.

1.2. Grading criteria for performance tests:

- YES/NO Checklist: Describe in detail what constitutes satisfactory and unsatisfactory performance.

    - For Process Testing: Describe the correct procedure, including the following:

        - Number of points each step or group of steps is worth
        - Number of points to be deducted for specific errors
        - Number of trials allowed per step or group of steps
        - Procedural steps which, if performed improperly, cause trainee failure and test stoppage

    - For Product Testing: Describe the characteristics of a good product, including:

        - Point value assigned each characteristic
        - Number of points to be deducted for specific errors
        - Number of trials allowed for each product
        - Any omitted characteristic that is cause for failure

- Rating Scale: Describe in detail how the trainees' grades will be determined.

1.3. Other important grading criteria factors:

- Compliance with required safety precautions
- Correct operation of equipment after completed assembly
- Physical testing of the finished job

8-C-2

- Time required completing the job
- Skill in using tools
- Care and use of the equipment

> The grading criteria should describe what the trainee is expected to do and what happens if the requirements are not met.

STAGE THREE

CHAPTER 9

VISUAL INFORMATION (VI)

AND

INSTRUCTIONAL MEDIA MATERIAL (IMM)

INTRODUCTION

In the previous chapters you were told how to develop and revise curriculum materials for new and existing courses. The output of those chapters was Lesson Plans (LP), Trainee Guide (TG), and Test Packages. You are now ready to begin work on the Visual Information (VI) that supports the LP's and TG's that you have already developed.

Additionally, information will be provided for developing the On-the-Job (OJT) Training Handbook, one form of Instructional Media Material (IMM). Note that VI, either singly or in combination with other VI, may be transformed into IMM by making it a self-supporting package.

Selecting VI materials always begins with a careful analysis of learning objectives (LOs) to determine the most appropriate VI and ends with course promulgation. In this chapter, step-by-step procedures for the analysis of objectives, selection of the most appropriate VI product(s) based on the analysis, are outlined.

Production of VI materials, other than simple graphics and overhead transparencies, is seldom accomplished directly by in-house curriculum developers. This is because VI production is governed by detailed OPNAV and NETC instructions. VI products must be developed in accordance with the latest regulations. Your command's VI Manager will assist you in gathering information and completing required forms.

OPNAVINST 5290.3 (series), SECNAV 5870.4 (series), and NETCINST 3140.1 (series) defines the VI products exempt from production reporting requirements. Exemptions include graphics and overhead transparencies. Ensure all Copyright procedures are followed per previous instructions.

SCOPE

- Define types and applications of VI materials
- Determine the need for VI materials
- Determine the type(s) of VI materials which best support training
- Explain the VI development process
- Provide an overview of OJT Handbook development, one form of IMM

DEFINITIONS

VI: Use of one or more of the various visual media devices with or without sound. VI includes still and motion picture photography, video recording with or without sound, graphic arts, visual aids, models, displays, visual presentation services, and the support processes (NETCINST 3104.1 (series) and Military Handbook (MIL-HDBK) 29612-3 (series)).

IM: Instructional materials that present a body of information and are largely self-supporting rather than supplementary in the teaching-learning process. These materials have applications for independent study/skill acquisition.

INFORMATION

VI materials are used to introduce, reinforce, or supplement training provided in the formal environment. They are primarily used in conjunction with a LP.

> Because of its wide range of applications and uses, interactive courseware (ICW) is *NOT* addressed in this chapter as audio/visual media. MPT&E CIOSWIT-ILE-STD-1B and MPT&E CIOSWIT-ILE-Guide-3B addresses analysis, development, and application of ICW.

SECTION 1 - VI MATERIALS AND IN-HOUSE CURRICULUM DEVELOPERS

- Because of the requirements of covering instructions, VI materials development is generally limited to simple transparencies and schoolhouse produced training aids.
- Complex transparencies requiring graphics arts services and VI products meeting the definition in current instructions need to be produce in accordance these directives.

1.1. Procedures for Selecting VI Materials: Each item of VI material has its own unique application and contribution to learning. While some approaches are better than others, many factors must be considered by the curriculum developer when determining the type(s) of VI materials to be used for a given situation. Application, advantages, disadvantages, and cost for development and maintenance must be considered in the selection process. However, the final VI item(s) selected should be that

which, in the Curriculum Developer's judgment, best supports the LOs, based on an evaluation of the course. VI materials selection and application has three basic components:

> Development of professional-looking, instructionally effective VI materials is costly and time consuming. NETC has been criticized for failure to properly manage VI production to reduce duplication of effort. Therefore, VI materials of greater complexity than what can be produced by in-house developers must adhere to the requirements of NETCINST 3104.1 (series) and its supporting instructions. Use your initiative and imagination to identify and select appropriate VI materials; leave production to the professionals. "Free lance" VI production is definitely discouraged and may be contrary to regulations.

- Needs Assessment. Evaluates learning objectives for a given Lesson Topic/Course to determine if VI support is required and, if a need is determined, which type(s) should be developed.
- Development. Provides the necessary information needed to develop the selected type(s) of VI items to support given LOs.
- Pilot. Evaluates all VI materials developed for a given Lesson Topic/Course in the actual training environment to determine accuracy and adequacy in support of the Learning Objectives. VI materials should be completed and available at the same time other course materials are ready for pilot.
- VI selection factors are discussed in the following paragraphs.

1.2. Needs Assessment: Follow the steps listed below to complete your VI materials Needs Assessment.

- Evaluate the LOs in a Lesson Topic using the questions below:

  - Would VI Aids enhance "Hands On" Training? (Skill enhancement)
  - Would VI Aids enhance understanding of the Learning Objective? (Knowledge enhancement)

- Continue with the following steps if you answered "Yes"
  to either of the above questions. A "No" response
  indicates VI materials may not be appropriate.
- Evaluate the LOs against the VI characteristics
  (applications, advantages, disadvantages and cost
  considerations) listed in the VI characteristics outline
  to determine the type(s) of VI which best supports the
  LO(s).
- Review LOs to determine if multiple learning objectives
  could be supported by a single VI item
- Select the next LOs and repeat the process until the VI
  Needs Assessment has been completed for each Lesson Topic

1.3. VI Development: Other than creating simple transparencies
and training aids within the capability of in-house developers,
all development of VI products must comply with current
directives. Because professional VI production is costly and
takes time, early liaison with the command's VI Manager is
essential.

SECTION 2 - VI CHARACTERISTICS TABLE

Applications, advantages, disadvantages, and cost
considerations

AUDIO PRESENTATION

2.1. Applications:

- When sound is critical to training
- Large group instruction
- Small group instruction
- Individual instruction
- May support a slide presentation
- Augment other VI and IMM packages

2.2. Advantages:

- Provide alternate information sources for trainees with
  low reading skill levels
- Permit the rearrangement of sound materials through
  editing
- Playback units can be small and portable
- Tapes may be erased and reused

2.3. Disadvantages:

- Susceptible to outside distraction if earphones are not used
- Fixed rate of information flow; therefore, adjustments to learning rate are difficult

2.4. Cost Considerations: When recordings are produced locally with existing recorders the cost is very low. Audio tape recorders/players are inexpensive.

2.5. Development Procedures: In accordance with NETCINST 3104.1 (series), (see your command's VI Manager).

SECTION 3 - SLIDE PRESENTATION

3.1. Applications:

- Presentations consist of a series of 35mm slides which are developed to assist and supplement instruction by providing a sequential visual presentation of materials, ideas, or concepts.
- Present a complete subject within a self-contained package.
- Programmed by a LP, audiocassette or other software.
- Supplement or reinforce discussion points within a topic.

3.2. Advantages:

- The full range of photographic techniques (stop action, selected depth of field, microphotography, air brushing, etc.) is available.
- Slide sequence may be rearranged easily to meet specific needs. Slide update is easily accomplished without extensive changes or expensive equipment.
- Slides can be made with any 35mm camera.
- The projected image can be seen by large groups.
- Can easily be produced by computer graphics packages.

3.3. Disadvantages:

- Full motion cannot be shown
- For group use, the room must be partially darkened for good visibility

- The instructor cannot provide additional visual data as with a transparency

3.4. Cost Considerations: Individual slides are relatively inexpensive to produce. The major cost of slide presentations is development of the Audio-Visual concept of the program itself. Transparencies and other single visual media do not require the planning and coordination necessary to build an entire slide presentation.

3.5. Development Procedures. Per NETCINST 3104.1 (series) (see your command's VI Manager).

<div align="center">

SECTION 4 - TRANSPARENCY AND DIGITAL STILLS

</div>

4.1. Applications: Transparencies and digital stills are the most frequently used VI aid in support of instruction. Discussed here are basic transparencies containing text and graphics can be developed on most desktop computers and produced on office reproduction equipment. A threshold is reached when the services of graphics arts is required (engine cutaway drawings, hydraulic flow diagrams, etc). Take the time to have your ideas expressed in a professional-looking product by your VI support personnel.

- Assist and supplement instruction by providing a visual presentation to the trainees.
- Supplement, do not replace, the spoken word.
- Present one central idea with maximum clarity and simplicity.

4.2. Advantages:

- Easy to prepare
- If you have a copy machine, you can make transparencies
- Easy to revise and re-sequence
- Require few environmental adjustments
- Require an overhead projector and appropriate PC software per format of digital stills

4.3. Disadvantages:

- Very few
- In large quantities, may be difficult to use and store

4.4. Cost Considerations: Simple text and graphics
transparencies and digital stills are an inexpensive medium.
Development and implementation costs are relatively low because
of the minimal expense of the materials utilized. Maintenance
and duplication are relatively inexpensive.

4.5. Development Procedures: OPNAVINST 3104.1 (series),
enclosure (1), paragraph 7 defines the VI products exempt from
production reporting requirements. Exemptions include graphics
and overhead transparencies. Development of transparencies is
accomplished by any means available to the developer.

SECTION 5 - VIDEO TAPES/DIGITAL MEDIA

5.1. Applications:

- Provide one of the best means of conveying an idea or
  series of ideas where complex or dangerous operations or
  motion must be presented. Video tapes/video media can be
  provided as stand-alone
- May be programmed or specialized presentations, depending
  on the need and conditions surrounding the training
- Designed to support a central theme by developing several
  major points into a continuous flow of information
- Generally do not require any specific programming
  however, where applicable, they may be programmed from LP
- Designed to support a central idea by developing several
  major points into a continuous flow of information
- Present one or a related series of segments, each
  designed to illustrate a single concept or idea
- Developed when motion or a complex operation is difficult
  to present using transparencies or other conventional
  media

5.2. Advantages:

- The immediate search and playback capabilities permit
  greater utilization of the learning effort
- Familiarity of the average trainee with the equipment
  minimizes distracting novelty effects
- Video Tapes/digital media are relatively inexpensive to
  duplicate, either one time or in large quantity
- Provide alternate information channels for trainees with
  low reading skills
- Provide continuity of action, showing events as they
  actually occur

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- "Front seats" can be provided. Demonstrations can be shown, using all necessary equipment, showing all of the actual steps. Everything can be shown at the right angle, aspect, and speed for the best analysis and learning
- Skills can be learned by watching a task performed on film and subsequently practicing the task
- Dangerous or expensive procedures can be shown

5.3. Disadvantages:

- Tape size and format differences make video tapes incompatible with some types of video playback equipment
- Playback units/systems are expensive

5.4. Cost Considerations: Development of high quality videotaped studio productions requires a large and highly skilled staff. As technology continues to grow, better results are being obtained using hand-held cameras and mobile studios. Original productions require a significant amount of preliminary design work long before actual taping begins

5.5. Development Procedures: Per NETCINST 3104.1 (series) (see your command's VI Manager).

<center>SECTION 6 - WALL CHARTS (WC)</center>

6.1. Applications:

- Used much like transparencies to assist and supplement instruction by providing a visual presentation to the trainees
- Programmed by the Related Instructor Activity (RIA) column of the LP
- Directs the Instructor to provide information while addressing the WC as a visual to amplify the information being presented
- In general, WCs:

  - Supplement, do not replace, the instructor
  - Focus rather than divert attention
  - Present one central idea with maximum clarity and simplicity
  - Can be used to provide visual support to more than one discussion point

6.2. Advantages:

- Require fewer environmental adjustments than projected visuals
- Not dependent upon availability and operability of projection equipment

6.3. Disadvantages:

- Rely heavily on the effectiveness of the instructor
- May contain too much detail
- In large quantities, more difficult to use and store in comparison to projected visuals
- Relatively long lead time for revision

6.4. Cost Considerations: WCs are primarily an inexpensive medium. Development and implementation costs are relatively low because of the minimal expense of the materials utilized. Maintenance and duplication are relatively inexpensive.

6.5. Development Procedures. Per NETCINST 3104.1 (series) (see your command's VI Manager).

SECTION 7 - INSTRUCTIONAL MEDIA MATERIAL (IMM) ON-THE-JOB TRAINING (OJT) HANDBOOK

7.1. Information: For our purposes, IMM is considered to be "stand alone" instructional packages. The OJT Handbook is the most common, and is the IMM most commonly produced by in-house curriculum developers. IMM can:

- Provide training for which formal schools have a lack of equipment, space, time, or instructors
- Provide training that may be used for remedial or accelerated instruction
- Provide prerequisite training for advanced courses
- Fill gaps in training that occur within or between courses
- Provide instruction in subjects which are difficult to present in the lecture environment or skills which cannot be performed in the laboratory environment
- Generate/maintain trainee interest in a Lesson Topic

7.2. Applications:

- Consist of a single lesson or a series of lessons designed to support selected learning objectives
- In effect, a self-study learning package
- Require little or no assistance to complete
- May use support materials such as audio tapes, slides or videotapes as part of the presentation
- Can be used as stand-alone training or remedial training

7.3. Advantages:

- Each trainee can precede at a rate in accordance with his/her particular abilities
- Training may be accomplished at convenient times and places
- Topics can be repeated or restudied as desired or required
- Difficulty and level of training may be adapted to varying trainee populations
- Cost per trainee is quite low, if throughput is high and content stable

7.4. Disadvantages:

- Long development time
- Rely heavily on the reading ability of the trainee
- Hard to ensure configuration control

7.5. Cost Considerations: The initial cost for development, including writing and piloting OJT Handbooks may be higher than other printed materials. Maintenance costs depend on the revision requirements, but will normally be higher than for other materials. When augmented by audio and/or visuals, development and maintenance costs are even higher.

NOTE

See Addendum 9-A for development procedures.

SECTION 8 - SUMMARY

Development of the appropriate VI materials and IMM starts when all LO for the course have been evaluated and the type or types of instructional support have been selected. VI

materials, other than simple transparencies that can be developed locally, require liaison with the command's VI Manager. A step-by-step procedure for the development of the OJT Handbook form of IMM is included in this chapter. All VI materials and IMM are piloted to determine if the LOs are adequately supported.

ADDENDUM 9-A

ON-THE-JOB TRAINING HANDBOOK

SECTION 1 - DEVELOPMENT

STEP 1 - VISUALIZE OBJECTIVES

Before an OJT Handbook can be developed, the overall goal or theme must be established. The developer must determine what ideas or concepts should be learned and develop the OJT Handbook to enforce these ideas or concepts. If LOs do not currently exist, refer to chapters 3, 4 and 5 of this manual for analysis and development procedures prior to continuing.

- Evaluate LOs and determine the overall goal or theme of the OJT Handbook.
- Evaluate LOs for key elements that need support materials to illustrate overall goal or theme.
- Determine the support materials needed to illustrate key elements.

STEP 2 - DEVELOP OJT HANDBOOK OUTLINE

- List the LOs of the OJT Handbook in a logical teaching sequence.
- The LOs should now be arranged into logical groupings of knowledge and/or skills.
- These groupings provide the outline for the lessons in the OJT Handbook.

STEP 3 - DEVELOP LESSONS

Materials are developed for the lessons identified in STEP 2 of this procedure. They are designed to meet specific knowledge and/or skill requirements as called for in the LOs. Each lesson should be designed so that an average trainee can complete the lesson within 20 to 45 minutes. Generally, lessons consist of the following elements:

- **LOs.** Provide a list of the objectives that will be accomplished upon completion of the OJT Handbook
- **LESSON PRETEST**

  - For lessons which have a knowledge requirement
  - Designed to identify weaknesses in the trainee's knowledge of the lesson LOs
  - The results of the Lesson Pretest are used to direct trainees to specific study assignments to correct the identified weaknesses

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- Use the procedures for Test Item Development contained in Chapter 8 of this manual
- One question per LO should be the minimum
- Include an evaluation procedure to help the trainee develop a personalized study plan for the lesson. Include directions on where to locate the answers to the pretest

- **ASSIGNMENT SHEETS CONTAIN THE FOLLOWING:**

  - Introduction: States the purpose of the assignment
  - Learning Objectives: List the objectives that will be accomplished upon completion of the assignment
  - Related Materials: List all materials not contained in the OJT Handbook but required to complete the lesson
  - Study Assignments: Contains a listing of study assignments relating to each Lesson Pretest question and instructions for completing each study assignment

- **INFORMATION SHEETS:**

  - Develop when the information needed to complete the OJT Handbook is not found in sources available to the trainee or if the available information is inadequate to meet the goals of the lesson
  - Use the same procedures as development of an Information Sheet for a Trainee Guide (TG). See chapter 7 of this manual

- **WORK SHEETS:**

  - Assign knowledge skill or physical skill tasks for the trainee to perform
  - Can be used as the lesson itself or as part of the lesson

- **CONTAIN THE FOLLOWING ELEMENTS:**

  - Introduction. States the purpose of the worksheet and lists the LOs to be met by the lesson
  - Related Materials. List all materials not contained in the OJT Handbook but required to complete the lesson
  - Equipment. List all equipment to which the trainee must have access in order to complete the work sheet

- Work Assignments Instructions. Direct the trainee to proceed to the next OJT Handbook element upon completion of the assigned tasks or to postpone the tasks if the equipment and/or supervision are not available
- Tasks Paragraph. Lists the work assignments which may involve the use of a system, subsystem and/or equipment in conjunction with standard operation and maintenance procedures or may direct the trainee to exercise mental skills

- **END-OF-LESSON TESTS:**

  - Each lesson concludes with an End-of-Lesson Test. The test contains instructions directing the trainee through the test and on to the next OJT Handbook element upon successful completion.
  - Use the procedures for Test Item Development contained in chapter 8 of this manual.
  - Include questions that directly correspond to the lesson LO and questions asked on the Lesson Pretest.

- **ANSWER SHEETS:**

  - Develop for both the Lesson Pretest and the End-of-Lesson Test
  - Designed to provide immediate feedback to the trainee
  - May consist of a separate blank question form with a corresponding list of answers

VI used as supporting materials for an OJT Handbook is developed using the procedures contained in the VI portion of this Chapter.

STEP 4 - DEVELOP FRONT MATTER

- Designed to introduce and describe the contents of the OJT Handbook
- Consists of the following elements:

  - Title Page. Lists the title and other identifying information for the OJT Handbook
  - Contents Page. Lists the lesson subject titles and the beginning page numbers for each element of the lessons
  - Introduction. Informs the trainee of the purpose of the OJT Handbook, approximate completion time, OJT

Handbook LOs, recommended prerequisites, and safety and/or security requirements associated with the OJT Handbook. Additionally, the introduction provides a description of each element of the OJT Handbook and any related materials needed to complete the OJT Handbook

STEP 5 - ASSEMBLE OJT HANDBOOK

When all materials have been developed, the OJT Handbook is assembled into a single document following the outline developed in STEP 2 of this procedure.

STEP 6 - REVIEW OJT HANDBOOK

Review OJT Handbook to verify that:

- Content is technically accurate. This should be done by a Subject Matter Expert (SME).
- The overall goal or theme of the OJT Handbook has been met
- The key elements that needed illustration have been supported by other IMM
- Detail of the OJT Handbook is at the same level and depth as the LO's being supported
- Classification markings are appropriate
- Lesson sequence supports the OJT Handbook outline
- Each knowledge lesson LO's is tested on the Lesson Pretest
- Each question on the Lesson Pretest has a corresponding question on the End-of-Lesson Test

STAGE FOUR

PILOT COURSE DEVELOP PHASE

CHAPTER 10

PILOT AND IMPLEMENTATION APPROVAL

INTRODUCTION

In previous chapters, the products of the Plan, Analyze, Design, and Develop Phases have been created and assembled. In this chapter, the products are presented as a full length course of instruction, conducted at a Navy School by Navy instructors — a pilot. The output of a successful pilot is approval of the curriculum materials for implementation.

SCOPE

- Provide an understanding of the process of validating curriculum materials
- Explain the terms which apply to the pilot and implementation
- Describe the step-by-step procedures for piloting curriculum materials

SECTION 1 - PILOT

A pilot is defined as the first full length course conducted at a Navy school, by Navy instructors, using the Curriculum and Supporting Training Materials prepared specifically for that course. The purpose is to validate the Curriculum and Materials, and to determine trainee effectiveness in attaining the Course Objective(s).

NOTE

Piloted Course of Instruction (COI) enrolled student population are actual trainees, not conducted with available staff in lieu of trainees.

1.1. Implementation: At the conclusion of the course pilot, and after corrections indicated by the pilot have been incorporated into the course material, the course is implemented by issuance of a Letter of Promulgation by the Course Curriculum Authority (CCA). Formal training commences at all designated sites.

1.2. Pilot Procedures:

- Volume III, chapter 6 provides detailed information on conducting a course pilot trial and subsequent implementation
- The procedures of Volume III, chapter 6 are generally applicable to pilot convenes of contractor-developed courses

1.3. Implementation Procedures

- A pilot serves to validate a Curriculum and its Supporting Materials. The Pilot Course Develop Phase includes formal approval of the course for instruction and placing it on line.

  - Revise the material as indicated by pilot
  - CCA issues Letter of Promulgation

- Following implementation, emphasis shifts to training course management and curriculum maintenance — the subjects of NAVEDTRA 135 (series).

LIST of ACRONYMS

AAC	Acquisition Advice Code
AG/SAG	Activity Group/Sub-Activity Group
AIM	Authoring Instructional Materials
AIM I	PPP Based Authoring Tool (Legacy)
AIM II	Task Based Authoring Tool (Legacy)
AOB	Average On Board
ASVAB	Armed Services Vocational Aptitude Battery
BCA	Business Case Analysis
CAGE	Commercial and Government Entity Code
CAIMS	Conventional Ammunition Integrated Management System
CANTRAC	Catalog of Navy Training Courses
CARIS	CNETC Automated Resource Information System
CBT	Computer Based Training
CCA	Curriculum Control Authority
CCMM	Course Curriculum Model Manager
CDA	Curriculum Developer Aid
CDP	Course Data Processing
CeTARS	Corporate enterprise Training Activity Resource System
CIN	Course Identification Number
CLO	Course Learning Objective
CM	Corrective Maintenance
CMS	Course Master Schedule
CNP	Chief of Naval Personnel
CO	Commanding Officer
COI	Curriculum Outline of Instruction
COG/NIIN/SMIC	Cognizance Code/National Item Identification Number/Special Material Identification Code
CPM	Content Planning Module
CTTL	Course Training Task List
DDA	Discussion-Demonstration Activity
DOD	Department of Defense
DOR	Drop On Request
DP	Discussion Point
DSOT	Daily System Operating Test
EO	Enabling Objective
FAL	Fault Applicability List
FC	Functional Commander
FEA	Front End Analysis
HPRR	Human Performance Requirements Review
ICW	Interactive Courseware
IETM	Interactive Electronic Technical Manual
IG	Instructor Guide
ILE	Integrated Learning Environment
IMI	Interactive Multimedia Instruction
IMM	Instructional Media Material

IPR	In Process Review
ISD	Instructional Systems Design
ITRO	Interservice Training Review Organization
JDTA	Job Duty Task Analysis
JTI	Job Task Inventory
KM	Knowledge Management
LC	Learning Center
LCMS	Learning Content Management System
LMS	Learning Management System
LO	Learning Objective
LOM	Learning Object Module
LP	Lesson Plan
LS	Learning Site
LSAR	Logistics Support Activity Record
LSO	Learning Standards Officer
LT	Lesson Topic
MCRF	Master Course Reference File
MILCON	Military Contract
MIL-STDS	Military Standards
NALC	Navy Ammunition Logistics Code
NCMR	Navy Curriculum Materials Repository
NEC	Navy Enlisted Classification
NETC	Naval Education and Training Command
NITRAS	Navy Integrated Training Resources Administration System
NKO	Navy Knowledge Online
NMETLS	Navy Mission Essential Task Lists
NOBC	Navy Officer Billet Classification
NPC	Navy Personnel Command
NTFS	Navy Training Feedback System
NTSP	Navy Training Systems Plan
OAC	Item-to-Objective Assignment Chart
O&MN	Operation and Maintenance Navy
OCCSTD	Occupational Standards
OJT	On-The-Job Training
PADDIE	Plan, Analyze, Design, Develop, Implement and Evaluate
PM	Preventive Maintenance
POA&M	Plan of Action and Milestones
POM	Program Objective Memorandum
PPP	Personnel Performance Profile
PQS	Personnel Qualification Standard
RIA	Related Instructor Activity
RIT	Revolution in Training
RRL	Resource Requirements Listing
SCORM	Shareable Content Reference Model
SME	Subject Matter Expert

SYSCOM	Systems Command
TA	Training Agency
TAM	Table Assignment Matrix
TCCD	Training Course Control Document
TD	Training Device
TDSR	Training Decision Summary Report
TG	Trainee Guide
TLA	Training Level Assignment
TLO	Terminal Learning Objective
TO	Terminal Objective
TOS	Training Objective Statement
TPC	Training Path Chart
TPP	Training Project Plan
TPS	Training Path System Plan
TRR	Training Requirements Review
TSA	Training Support Agency
TTE	Technical Training Equipment
TTO	Training Time Out
TYCOM	Type Commander
VI	Visual Information
WC	Wall Charts

_____

_____

PERSONNEL PERFORMANCE PROFILE BASED CURRICULUM DEVELOPMENT MANUAL VOLUME II SAMPLE PRODUCTS

TABLE OF CONTENTS

TAB A-1

TRAINING PROJECT PLAN

TRAINING PROJECT PLAN

FOR

Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course

A-113-0125

PREPARED FOR

Commander, Center for Surface Combat Systems (CSCS) Dahlgren

5395 First St. Dahlgren, VA 22448

PREPARED BY

PEO IWS3C

Crystal Center, 2450 Crystal Drive, Arlington, VA 22202-3843

April 2006

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TRAINING PROJECT PLAN

A. COURSE DATA

CIN: A-113-0125

_X_	___	___	___
New	Revision	Modification	Cancellation

CDP (s)   **Training Site (s)**

1. 582L   Center for Surface Combat Systems (CSCS) Learning Detachment,
                  Dam Neck
                  1912 Regulus Ave. Virginia Beach, VA 23461-2098

Course Status: The Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course (A-113-0125) is currently in a DRAFT status pending the Pilot Convening at Center for Surface Combat Systems (CSCS) Learning Detachment, Dam Neck, VA. Current throughput is being managed by "Factory Training".

Course length extended from 80 training hours (12 calender days) to 120 training hours (19 calender days) to support the incorporation of Gun Computer System Pre-Faulted Modules into Factory Training.
Reference: Video TeleConference (VTC) with Moran, Katherine A LT CSCS Dahlgren, Code N32,
03 FEB 06

All deltas regarding Pre-Faulted Modules and technical documentation will be resolved prior to Course Pilot scheduled for 6 NOV 06.

Course Mission Statement: To train E4-E8 Fire Controlmen the Operation and Maintenance on the Gun Computer System (GCS) MK 160 MOD 8 and Optical Sight System (OSS) MK 46 MOD1 differences at the Journeyman Level on DDG-81and newer hulls both import and underway with minimal supervision.

Occupational Classification/Prerequisites: Occupational Classification - NEC FC-1139 will be awarded upon successful completion of the training.

Prerequisites:

1. Successful completion of the GCS MK 160 MOD 4&6/OSS MK 46 MOD 0 Operation and Maintenance Course (A-113-0131) (FC-1120)

2. Rating: Fire Controlman

3. Paygrade: E4 to E7

Course Overview

The Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course (A-113-0125) is designed to provide the knowledge and practical skills necessary for FC-1139 personnel to operate and maintain these two systems on board DDG-51 class ships and at sites ashore. In support of this objective, the differences course will contain theory, operation, preventive and documented corrective maintenance instruction for the following systems:

1. Gun Weapon System (GWS) MK 34 MOD 1
2. Gun Computer System (GCS) MK 160 MOD 8
3. Gun Console (GC) OJ-719(V)/UYQ-70(V)
4. Recorder-Reproducer (RCRP) MK 27 MOD 1
5. Gun Console Computer (GCC) AN/UYK-44(V) Enhanced Processor/Open System Module (EP/OSM) with Expansion Adapter Group (EAG) OF-174(V)
6. Gun Mount Processor (GMP) AN/UYK-44(V) (EP/OSM)
7. Gun Mount Control Panel (GMCP) MK 437 MOD 1
8. Optical Sight System (OSS) MK 46 MOD 1

All preventive maintenance will be taught in accordance with established PMS requirements and guidelines.

All corrective maintenance will be taught and performed in accordance with documented/published procedures.

Manning   Compensated from A-113-0131

71810   0839 623   FC1

MCRF Requirements

	GRAD	REQ	PLAN
FYO6	32	32	32
FY07	25	25	25
FY08	21	21	21
FY09	21	21	21
FY10	21	21	21

Training Site(s) Summary:

1. **Center for Surface Combat Systems (CSCS) Learning Detachment, Dam Neck**

	Course Length	Class Min Capacity	Class Max Capacity	Class Convenings	Average on Board	Student Throughput
Current:	0	0	0	0	0.00	0
Planned:	19	1	10	4	2.08	40

B. JUSTIFICATION:

1. Reference:

Navy Training Plan (NTP) S-30-8703E, Gun Weapon System (GWS) MK 34 MODs 0-4.

2. Reason/Source of Information:

This Training Project Plan (TPP) describes the course development for the Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 for differences information and practical application. The following establishes the need for the differences course development:

A. The GCS MK 160 MOD 8 is installed as the gun fire control computer system as part of the Gun Weapon System (GWS) MK 34 MOD 1 on board DDGs 81 through 90.

B. The OSS MK 46 MOD 1 is installed as the electro-optic sensor as part of the Gun Weapon System (GWS) MK 34 MOD 1 on board DDGs 85 through 112.

3. Impact If Not Approved:

Failure to develop the three week GCS MK 160 MOD 8/OSS MK 46 MOD 1 Differences Course would inhibit the provision of baseline knowledge and practical application skills necessary for FC-1139 personnel to perform operation and maintenance for GCS MK 160 MOD 8/OSS MK 46 MOD 1 equipment in support of shipboard and land-based operations.

C. SAFETY RISKS AND HAZARDOUS MATERIALS:

This course is not designated "high-risk". Safety and supervisory procedures shall be maintained at a level that ensures training is conducted in a safe manner while providing the realism required to fulfill fleet operational and maintenance requirements, within practical limits.

D. CURRICULUM DEVELOPMENT METHOD:

1. Curriculum will be developed in accordance with NAVEDTRA 131 (A).

2. The documents that will be produced for this course will be as follows:
   X a. Training Project Plan
   X b. Personnel Performance Profile
   X c. Training Path System
   X d. Training Course Control Document
   X e. Lesson Plan
   X f. Trainee Guide
   X g. Test Package
   * X h. Support Materials

   * Not produced by AIM I

3. The primary mode of instruction:

   The primary mode of instruction will be group-paced consisting of classroom lecture and laboratory learning experiences with Job Sheets for Preventive and documented Corrective Maintenance Training. The trainee will be guided by the instructor during performance of all Job Sheets to allow for maximum acquisition of knowledge and skills.

E. RESOURCE REQUIREMENTS:

SITE: Center for Surface Combat Systems (CSCS) Learning Detachment, Dam Neck
CPATS Document #: Not used - Leave Blank
Cost Account Code: 3456

Manpower

	FY2006	FY2007	FY2008	FY2009	FY2010
Enlisted Billets Required	1	1	1	1	1
Billets Authorized	0	1	1	1	1
Billets Compensated	1	0	0	0	0
Billets Available	0	0	0	0	0
Delta	1	0	0	0	0

Notes
FY06 compensated from A-113-0131.
FY07-10 anticipate billet gain.

Funding

Approp	AG/SAG	Expense	FY2006	FY2007	FY2008	FY2009	FY2010
OM&N	3K/1K	Y	$240	$290	$340	$390	$440

Facilities

1. Facility requirements for GCS MK 160 MOD 8/OSS MK 46 MOD 1 technical Training Equipment (TTE) shall be in accordance with Equipment Facilities Requiment No. S01947. Facility requirements for OSS MK 46 MOD 1 TTE shall be in accordance with EFR No. S_EFR_529_02002.

2.   Point of Contact:

      Naval Surface Warfare Center Port Hueneme Division, Louisville Detachment
      Ms. Kimberly Bischoff, Logistics Manager
      160 Rochester Dr.
      Louisville, Kentucky 40214-2681
      (502) 364-5383
      kimberly.bischoff@navy.mil

SITE: Center for Surface Combat Systems (CSCS) Learning Detachment, Dam Neck

Site Consideration:

Equipment

No.	Type/Nomenclature	Part Number	COG/NIIN/SMIC	QTY REQ'D	QTY O/H	QTY Short	U/I	Unit Cost	CAGE Code	SM&R Code	Technical Reference
1.	Above Deck Sensor Unit MK 85 MOD 1 (p/o OSS MK 46 MOD 1)	006040518		1	1	0	EA		34228		SW210-A1-MMO-010/020
2.	Command and Decision Console OJ-719(V)/UYQ-70(V) (p/o GCS MK 160 MOD 8)	7244436		1	1	0	EA	$275,000.00	53711		SE686-CA-MMO-050
3.	Control and Display Console (CDC) MK 132 MOD 2 (p/o OSS MK 46 MOD 1)	006040525		1	1	0	EA		34228		SW210-A1-MMO-010/020
4.	Gun Computer System (GCS) MK 160 MOD 8	No Number		1	1	0	zEA		53711		SW224-A8-MMO-010
5.	Gun Console Computer (GCC) AN/UYK-44(V) (EP/OSM) with Expansion Adapter Group (EAG) OF-174(V) (p/o GCS MK 160 MOD 8)	7221614-01		1	1	0	EA	$495,000.00	81349		SW224-A8-MMO-010, SE610-PV-MMO-010, SE610-PV-SUP-030
6.	Gun Mount Control Panel (GMCP) MK 437 MOD 1	7244531		1	1	0	EA	$70,000.00	53711		SW224-A8-MMO-010
7.	Gun Mount Processor (GMP) AN/UYK-44(V) (EP/OSM) (P/o GCS MK 160 MOD 8	7221614-01		1	1	0	EA	$335,000.00	81349		SW224-A8-MMO-010
8.	Optical Sight System (OSS) MK 46 MOD 1	0-006040005		1	1	0	EA	$1,700,000.00			SW210-A1-MMO-010/020
9.	Power Supply (PS) MK 177 MOD 1 (p/o OSS MK 46 MOD 1)	006040535		1	1	0	EA		34228		SW210-A1-MMO-010/020
10.	Recorder Reproducer (RCRP) MK 27 MOD 1 (p/o GCS MK 160 MOD 8)	7244867-1		1	1	0	EA	$120,000.00	53711		SW224-AA-MMO-010

FOR TRAINING USE ONLY

No.	Type/Nomenclature	Part Number	COG/NIIN/SMIC	QTY REQ'D	QTY O/H	QTY Short	U/I	Unit Cost	CAGE Code	SM&R Code	Technical Reference
11.	Safety Switch S1 (p/o OSS MK 46 MOD 1)	071449		1	1	0	EA		34228		SW210-A1-MMO-010/020
12.	Stabilization and Electronics Unit (SEU) MK 104 MOD 1 (p/o OSS M K46 MOD 1)	00604A666		1	1	0	EA		34228		SW210-A1-MMO-010/020

Hand Tools

No.	Type/Nomenclature	Part Number	COG/NIIN/SMIC	QTY REQ'D	QTY O/H	QTY Short	U/I	Unit Cost	CAGE Code	SM&R Code	Technical Reference
1.	General Purpose Hand Tools	N/A		1	0	1		$150.00	53711		N/A

Prefaulted Modules

No.	Type/Nomenclature	Part Number	COG/NIIN/SMIC	QTY REQ'D	QTY O/H	QTY Short	U/I	Unit Cost	CAGE Code	SM&R Code	Technical Reference
1.	S1277 #1 (GMCP) Failed Power Supply, Gun Mount Control Panel (GMCP) MK 437 MOD 1	20010006-015		1	0	1	EA		54779	PAODD	SW224-A8-MMO-010
2.	S1277 #2 (GMCP) Failed Velocimeter Faile-Safe CCA	7625460	5998-01-525-9124	1	0	1	EA	$2,000.00	53711	PAODD	SW224-A8-MMO-010
3.	S1277 #3 (GMCP) Failed Indicating Fuze Holder	FHL32W-11	5920-00-065-9251	1	0	1	EA	$80.00	84613	PAODD	SW224-A8-MMO-010
4.	S2789 #1 (OSS) Failed OSS CPU 2A1A3A1A9	6937022		1	0	1	EA	$3,000.00	53711	PAODD	SW210-A1-MMO-010
5.	S2789 #2 (OSS) Failed Relay Driver CCA 3A1	6939846		1	0	1	EA	$9,000.00	53711	PAODD	SW210-A1-MMO-010
6.	S2789 #3 (OSS) Failed Encoder CCA 2A1A3A1A15	6936847	5998-01-531-2658	1	0	1	EA	$5,000.00	53711	PAODD	SW210-A1-MMO-010
7.	S2789 #4 (OSS) Disable F/O Transmitter 4A2, 3, 4, or 5 Fault Insertion Technique	N/A	N/A	1	1	0	N/A		N/A	N/A	SW210-A1-MMO-010
8.	S2789 #5 (OSS) Disable Safety Switch Connector S1J1 Fault Insertion Technique	N/A	N/A	1	1	0	N/A		N/A	N/A	SW210-A1-MMO-010

9. S2789 #6 (OSS) Fuze Failure for PS MK 177 MOD 1 Test Panel Fault Insertion Technique	N/A	N/A	1	1	0	N/A		N/A	N/A	SW210-A1-MMO-010
10. S2805 #1 (GCC) Failed Fiber Distributed Data Interface CCA	5211-DAS-ST-1M		1	0	1	EA		2V643	PAODD	SW224-A8-MMO-010
11. S2805 #2 (GMP) Failed VME-IOC CCA Fault Insertion Technique	N/A	N/A	1	0	1	N/A	$0.00	N/A		SW224-A8-MMO-010
12. S2805 #3 (GCC) Failed Clock Re-Driver CCA	7365072		1	0	1	EA			PAODD	SW224-A8-MMO-010
13. S2805 #4 (GMP) Failed SCRAMNet CCA	H-AS-D6VME 04M-02		1	0	1	EA			PAODD	SW224-A8-MMO-010
14. S2805 #5 (GCC) Failed Motorola 2600 Single Board Computer (SBC) CCA	7244868-02		1	0	1	EA		53711	PAODD	SW224-A8-MMO-010
15. S2805 #6 (GMP) Failed Enhanced Processor (EP)/VME CCA	7372452-17		1	0	1	EA		90536	PAODD	SW224-A8-MMO-010
16. S3399 #1 (Gun Console) Disabled SCSI Cable Interface Fault Insertion Technique	N/A	N/A	1	1	0	N/A		N/A	N/A	SE686-CA-MMO-050, SE686-CL-MMO-030
17. S3399 #2 (Gun Console) Disable CB1 Fault Insertion Technique	N/A	N/A	1	1	0	N/A		N/A		SE686-CA-MMO-050, SE686-CL-MMO-030
18. S3706 #1 (RCRP) Failed Isolation Transformer to DCC Power Cable			1	1	0	EA	$20.00	53711	PAODD	SW224-AA-MMO-010
19. S3706 #2 (RCRP) Failed Data Storage Set (DSS) Power Supply	709SZ005-02	6130-01-448-1139	1	0	1	EA	$2,300.00	51398	PAODD	SW224-AA-MMO-010
20. S3706 #3 (RCRP) Failed Ethernet Tee Connector	BN23	9N 5935-01-495-3088	1	0	1	EA	$4.00	3SCL2	XBOZZ	SW224-AA-MMO-010

No.	Number	Title	Supplier	QTY REQ'D	QTY O/H	QTY Short
1.	MIP 4801/006 OPNAVINST 4790 (Series)	Preventive Maintenance Requirements for Gun Weapon System (GWS) MK 34 MOD 0 & 1	Naval Sea Systems Command	1	1	0
2.	MIP 4813/007 OPNAVINST 4790 (Series)	Preventive Maintenance for Optical Sight System (OSS) MK 46 MOD 0 & 1	Naval Sea Systems Command	1	1	0
3.	MIP 4813/008 OPNAVINST 4790 (Series)	Preventive Maintenance for Gun Computer System (GCS) MK 160 (MOD)	Naval Sea Systems Command	1	1	0
4.	OPNAVINST 5510.10 (Series)	Information and Personnel Security Program Regulation	Naval Sea Systems Command	1	1	0
5.	SE610-PV-MMO-010	Organizational Level Maintenance for Data Processing Set (DPS) AN/UYK-44(V)	NSWCPHD-L	12	12	0
6.	SE610-PV-SUP-030	Technical Manual Supplement for Data Processing Set (DPS) AN/UYK-44(V)	NSWCPHD-L	12	12	0
7.	SE686-CA-MMO-050	Maintenance Manual for Command and Decision Console OJ-719(V)/UYQ-70(V)	NSWCPHD-L	12	12	0
8.	SE686-CL-MMO-030	Technical Manual for Command and Decision Console OJ-719(V)11/UYQ-70	NSWCPHD-L	12	12	0
9.	SW210-A1-MMO-010	Technical Manual Optical Sight System MK 46 MOD 1	NSWCPHD-L	12	12	0
10.	SW210-A1-MMO-020	Technical Manual Optical Sight System MK 46 MOD 1	NSWCPHD-L	12	12	0
11.	SW221-A1-MMO-010	Maintenance Manual for Gun Weapon System MK 34 MOD 1	NSWCPHD-L	12	12	0
12.	SW224-A8-MMO-010	Maintenance Manual for Gun Computer System MK 160 MOD 8	NSWCPHD-L	12	12	0
13.	SW224-AA-MMO-A10	Technical Manual for Recorder Reproducer MK 27 MOD 1	NSWCPHD-L	12	12	0

Software

No.	Title	Number	Version	Vendor	Type	Cost	Reference	QTY REQ'D	QTY O/H	QTY Short
1.	Gun Computer System (GCS) MK 160 MOD 8 Operational Program	PGM 0819				$330.00	SW224-A8-MMO-010	2	2	0
2.	Gun Computer System MK 160 MOD 8 VxWorks Operating System	PGM 0807				$330.00	SW224-A8-MMO-010	2	2	0
3.	Gun Computer System Training Facility (GCSTF) Operational Program	PGM 0824				$330.00		2	2	0
4.	Gun Mount Interface Tester (GMIT) Operational Program	PGM 0823				$330.00		2	2	0

No.	Type/Nomenclature	Part Number	Unit Cost	COG/NIIN/SMIC	QTY REQ'D	QTY O/H	QTY Short
5.	Naval Surface Fire Support Embedded Trainer (NSFSET) Operational Program	PGM 0854	$330.00	SW224-A8-GYD-060	2	2	0
6.	Optical Sight System (OSS) MK 46 MOD 1 Operational Program	PGM 0834	$1,000.00	SW210-A1-MMO-010	2	2	0
7.	Optical Sight System (OSS) MK 46 MOD 1 VxWorks Operating System	PGM 0807	$500.00	Resident on Motorola 2604 variants of the 2A1A3A1A9 Central Processor CCA. Being phased out.	2	2	0
8.	Optical Sight System (OSS) MK 46 MOD 1 VxWorks Operating System	PGM 0838	$500.00	Resident on Motorola 270X-Series 2A1A3A1A9 Central Processor CCAs. Phase in beginning with DDG 90.	2	2	0
9.	Optical Sight System MK 46 MOD 1 X-Windows Display Manager	PGM 0840	$500.00	SW210-A1-MMO-010	2	2	0
10.	Recorder Reproducer Set (RCRP) MK 27 MOD 1 Operational Program	PGM 0829	$330.00	SW224-AA-MMO-010	2	2	0

Support Equipment

No.	Type/Nomenclature	Part Number	COG/NIIN/SMIC	QTY REQ'D	QTY O/H	QTY Short	U/I	Unit Cost	CAGE Code	SM&R Code	Technical Reference
1.	AEGIS Display System (ADS) Emulator (Briggs Box)	N/A		1	1	0	EA	$72,000.00	53711		None
2.	Gun Computer System Training Facility (GCSTF) Computer Monitor	N/A	N/A	1	1	0	EA	$2,000.00	53711		None
3.	Gun Computer System Training Facility (GCSTF) Equipment Rack	N/A	N/A	1	1	0	EA	$2,000.00	53711		None
4.	Gun Computer System Training Facility (GCSTF) keyboard	N/A	N/A	1	1	0	EA	$150.00	53711		N/A
5.	Gun Computer System Training Facility AN/UYK-44 (V) EP/OSM	7221614-01		1	1	0	EA	$335,000.00	81349		SE610-PV-MMO-010, SE610-PV-SUP-030

No.	Type/Nomenclature	Part Number	COG/NIIN/SMIC	QTY REQ'D	QTY O/H	QTY Short	U/I	Unit Cost	CAGE Code	SM&R Code	Technical Reference
6.	Gun Mount Interface Tester (GMIT) Desktop Computer	N/A	N/A	1	1	0	EA	$10,000.00	53711		N/A
7.	Vacuum Cleaner, General Purpose	N/A	N/A	1	1	0	EA	$100.00	53711		None

Test Equipment

No.	Type/Nomenclature	Part Number	COG/NIIN/SMIC	QTY REQ'D	QTY O/H	QTY Short	U/I	Unit Cost	CAGE Code	SM&R Code	Technical Reference
1.	Multimeter, Electronic, Digital, Fluke Corporation			1	0	1	EA	$240.00	9S972		N/A

Trainer Materials

No.	Type/Nomenclature	Part Number	COG/NIIN/SMIC	QTY REQ'D	QTY O/H	QTY Short	U/I	Unit Cost	CAGE Code	SM&R Code	Technical Reference
1.	Lesson Plan, Instructor, Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 DIfferences Course			2	0	2	EA	$22.00	N/A		N/A
2.	Trainee Guide, Student, Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course	N/A		12	0	12	EA	$3.00	N/A		N/A

F. COMPENSATION

Manpower	Number/Type Billets	Source of Compensation	Shortfall
Center for Surface Combat Systems (CSCS) Combat Systems Learning Detachment, Dam Neck	1/FC1139/9502	A-113-0131	1

Funding	Dollar Amount	Source of Compensation	Shortfall
Center for Surface Combat Systems (CSCS) Combat Systems Learning Detachment, Dam Neck	$0.00	PEO IWS3C	$0.00

G. MILESTONES

	Milestone	Date Start	Date Complete
1.	Training Project Plan	10 Apr 2006	21 Apr 2006
2.	Personnel Performance Profiles	24 Apr 2006	28 Apr 2006
3.	Training Path System	01 May 2006	12 May 2006
4.	Training Course Control Document	15 May 2006	26 May 2006
5.	Lesson Plan	29 May 2006	09 Jun 2006
6.	Trainee Guide	12 Jun 2006	16 Jun 2006
7.	Tests & Test Administrator's Guide	19 Jun 2006	23 Jun 2006
8.	Pre-Faulted Module Integration	03 Jul 2006	21 Jul 2006
9.	Pilot Course	06 Nov 2006	22 Nov 2006
10.	Pilot Course Monitoring Report	01 Dec 2006	15 Dec 2006
11.	Letter of Promulgation	23 Feb 2007	23 Feb 2007

TAB A-2

PERSONNEL PERFORMANCE PROFILES

EQUIPMENT PPP TABLE

EXAMPLES

PERSONNEL PERFORMANCE PROFILE

TABLE S1277

Gun Mount Control Panel (GMCP) MK 437

(EQUIPMENT LEVEL)

5/5/2009

EQUIPMENT MODIFICATION RECORD

SHIPALT 54321

NEW DESIGN - DRAWING NUMBER

DWG 67890

Table S1277. Gun Mount Control Panel (GMCP) MK 437

ITEM NO.	KNOWLEDGE/SKILL
1.	SUBSYSTEM KNOWLEDGE
1-1.	GENERAL DESCRIPTION
1-1-1.	State the purpose of the Gun Mount Control Panel (GMCP) MK 437.
1-1-2.	State the purpose of the major components of the Gun Mount Control Panel (GMCP) MK 437. a. Display Panel b. Power Supply c. Control/Display Terminal (A1) d. Isolation Panel (A2) e. Isolation Transformer (A3) f. Pedestal Assembly (A4)
1-1-3.	Define the abbreviations, terms, and symbols used with the Gun Mount Control Panel (GMCP) MK 437.
1-1-4.	State the operational characteristics and capabilities of the Gun Mount Control Panel (GMCP) MK 437.
1-1-5.	Describe the modification differences of the Gun Mount Control Panel (GMCP) MK 437.
1-1-6.	State the security requirements of the Gun Mount Control Panel (GMCP) MK 437.
1-2.	PHYSICAL DESCRIPTION
1-2-1.	Describe the major components of the Gun Mount Control Panel (GMCP) MK 437. Include name, nomenclature, physical appearance, reference designators, and location. a. Display Panel b. Power Supply c. Control/Display Terminal (A1) d. Isolation Panel (A2) e. Isolation Transformer (A3) f. Pedestal Assembly (A4)
1-2-2.	Describe the controls, displays, and indicators of the Gun Mount Control Panel (GMCP) MK 437. Include location and positions.
1-3.	FUNCTIONAL DESCRIPTION

Table S1277. Gun Mount Control Panel (GMCP) MK 437 (Continued)

ITEM NO.	KNOWLEDGE/SKILL
1-3-1.	Describe the functional operation of the Gun Mount Control Panel (GMCP) MK 437. Include types of signals, signal flow, signal/data format, sequential operation, indications, and inputs and outputs.
1-3-2.	Describe the function of the controls, displays, and indicators of the Gun Mount Control Panel (GMCP) MK 437.
1-4.	INTERFACE DESCRIPTION
1-4-1.	Describe the physical interface between the Gun Mount Control Panel (GMCP) MK 437 and related external equipment. Include name, physical appearance, reference designators, and locations of cable routings.
1-4-2.	Describe the functional interface between the Gun Mount Control Panel (GMCP) MK 437 and related external equipment. a. Electrical b. Electronic
1-5.	OPERATIONAL DESCRIPTION
1-5-1.	Describe the authority and regulations pertaining to the operation of the Gun Mount Control Panel (GMCP) MK 437.
1-5-2.	Describe the tasks/procedures to be performed when operating the Gun Mount Control Panel (GMCP) MK 437. a. Pre-operational tasks/procedures b. Operational tasks/procedures c. Post-operational tasks/procedures
1-5-3.	Describe the recognition and interpretation of the indications that should or may occur during the operation of the Gun Mount Control Panel (GMCP) MK 437. Include the displays and indicators.
1-5-4.	Describe the Gun Mount Control Panel (GMCP) MK 437 casualty mode/s of operation.
1-5-5.	Describe the personnel and equipment safety precautions that are to be observed during operation of the Gun Mount Control Panel (GMCP) MK 437.
1-6.	MAINTENANCE DESCRIPTION

Table S1277. Gun Mount Control Panel (GMCP) MK 437 (Continued)

ITEM NO.	KNOWLEDGE/SKILL
1-6-1.	Define the maintenance philosophy for the Gun Mount Control Panel (GMCP) MK 437. Include maintenance policy and management plan. a. Preventive maintenance b. Corrective maintenance
1-6-2.	Describe the preventive maintenance procedures contained in prescribed maintenance documentation for the Gun Mount Control Panel (GMCP) MK 437.
1-6-3.	Describe the operational tests contained in prescribed maintenance documentation for the Gun Mount Control Panel (GMCP) MK 437.
1-6-4.	Describe the recognition and interpretation of malfunction indications of the Gun Mount Control Panel (GMCP) MK 437.
1-6-5.	Describe the systematic fault isolation procedures contained in prescribed maintenance documentation for the Gun Mount Control Panel (GMCP) MK 437.
1-6-6.	Describe the disassembly, repair, and reassembly procedures contained in prescribed maintenance documentation for the Gun Mount Control Panel (GMCP) MK 437.
1-6-7.	Describe the post-repair procedures contained in prescribed maintenance documentation for the Gun Mount Control Panel (GMCP) MK 437.
1-6-8.	Describe the personnel and equipment safety precautions that are to be observed during maintenance of the Gun Mount Control Panel (GMCP) MK 437.
1-7.	DOCUMENTATION DESCRIPTION
1-7-1.	Describe the organization, content, and use of the technical documentation provided with the Gun Mount Control Panel (GMCP) MK 437. a. SW224-A4-MMO-010 b. SW224-A4-MMO-020 c. SW224-A4-MMO-A10 d. SW224-A9-MMO-010 e. SW224-A9-MMO-020 f. SW224-BX-MMO-010 g. SW224-BX-MMO-020

Table S1277. Gun Mount Control Panel (GMCP) MK 437 (Continued)

ITEM NO.	KNOWLEDGE/SKILL
2.	SUBSYSTEM SKILLS
2-1.	OPERATION
2-1-1.	Perform the tasks/procedures for operating the Gun Mount Control Panel (GMCP) MK 437. a. Pre-operational tasks/procedures b. Operational tasks/procedures c. Post-operational tasks/procedures
2-1-2.	Recognize and interpret the indications that occur during operation of the Gun Mount Control Panel (GMCP) MK 437.
2-1-3.	Perform the Gun Mount Control Panel (GMCP) MK 437 casualty mode/s of operation.
2-1-4.	Adhere to personnel and equipment safety precautions during operation of the Gun Mount Control Panel (GMCP) MK 437.
2-2.	MAINTENANCE
2-2-1.	Perform the preventive maintenance procedures for the Gun Mount Control Panel (GMCP) MK 437 as scheduled by the Planned Maintenance System (PMS).
2-2-2.	Perform the operational tests for the Gun Mount Control Panel (GMCP) MK 437.
2-2-3.	Recognize and interpret the malfunction indications of the Gun Mount Control Panel (GMCP) MK 437.
2-2-4.	Perform the systematic fault isolation procedures for the Gun Mount Control Panel (GMCP) MK 437.
2-2-5.	Perform the procedures to disassemble, repair and reassemble the Gun Mount Control Panel (GMCP) MK 437 to the authorized maintenance level.
2-2-6.	Perform the post-repair procedures for the Gun Mount Control Panel (GMCP) MK 437.
2-2-7.	Adhere to personnel and equipment safety precautions during maintenance of the Gun Mount Control Panel (GMCP) MK 437.

FOR TRAINING USE ONLY

SUBSYSTEM PPP

TABLE EXAMPLE

PERSONNEL PERFORMANCE PROFILE

TABLE S1274

Gun Computer System (GCS) MK 160

(SUBSYSTEM LEVEL)

5/5/2009

SUBSYSTEM MODIFICATION RECORD

None

NEW DESIGN - DRAWING NUMBER

None

Table S1274. Gun Computer System (GCS) MK 160

ITEM NO.	KNOWLEDGE/SKILL
1.	SUBSYSTEM KNOWLEDGE
1-1.	GENERAL DESCRIPTION
1-1-1.	State the purpose of the Gun Computer System (GCS) MK 160.
1-1-2.	State the purpose of the major components of the Gun Computer System (GCS) MK 160. a. Gun Console Computer (GCC) b. Gun Mount Processor (GMP) c. Gun Console (GC) d. Signal Data Converter/Gun Mount Processor (SDC/GMP) MK 20 e. Gun Mount Control Panel (GMCP) MK 437 f. Velocimeter MK 5 g. Recorder-Reproducer h. Gun Computer System Cabinet (GCSC) MK 119
1-1-3.	Define the abbreviations, terms, and symbols used with the Gun Computer System (GCS) MK 160.
1-1-4.	State the operational characteristics and capabilities of the Gun Computer System (GCS) MK 160.
1-1-5.	Describe the modification differences of the Gun Computer System (GCS) MK 160.
1-1-6.	State the security requirements of the Gun Computer System (GCS) MK 160.
1-2.	PHYSICAL DESCRIPTION
1-2-1.	Describe the major components of the Gun Computer System (GCS) MK 160. Include name, nomenclature, physical appearance, reference designators, and location. a. Gun Console Computer (GCC) b. Gun Mount Processor (GMP) c. Gun Console (GC) d. Signal Data Converter/Gun Mount Processor (SDC/GMP) MK 20 e. Gun Mount Control Panel (GMCP) MK 437 f. Velocimeter MK 5 g. Recorder-Reproducer h. Gun Computer System Cabinet (GCSC) MK 119

FOR TRAINING USE ONLY

ITEM NO.	KNOWLEDGE/SKILL
1-2-2.	Describe the controls, displays, indicators, and alarms of the Gun Computer System (GCS) MK 160. Include location and positions.
1-3.	FUNCTIONAL DESCRIPTION
1-3-1.	Describe the functional operation of the Gun Computer System (GCS) MK 160. Include types of signals, signal flow, signal/data format, sequential operation, indications, and inputs and outputs.
1-3-2.	Describe the function of the controls, displays, indicators, and alarms of the Gun Computer System (GCS) MK 160.
1-4.	INTERFACE DESCRIPTION
1-4-1.	Describe the physical interface between the Gun Computer System (GCS) MK 160 and related external equipment. Include name, physical appearance, reference designators, and locations of cable routings, junction boxes, switchboard connections, and cable terminations.
1-4-2.	Describe the functional interface between the Gun Computer System (GCS) MK 160 and related external equipment. a. Electrical b. Electronic
1-5.	OPERATIONAL DESCRIPTION
1-5-1.	Describe the authority and regulations pertaining to the operation of the Gun Computer System (GCS) MK 160.
1-5-2.	Describe the tasks/procedures to be performed when operating the Gun Computer System (GCS) MK 160. a. Pre-operational tasks/procedures b. Operational tasks/procedures c. Post-operational tasks/procedures
1-5-3.	Describe the recognition and interpretation of the indications that should or may occur during the operation of the Gun Computer System (GCS) MK 160. Include the displays, indicators, and alarms.
1-5-4.	Describe the Gun Computer System (GCS) MK 160 casualty, degraded, and abnormal mode/s of operation.

Table S1274. Gun Computer System (GCS) MK 160 (Continued)

ITEM NO.	KNOWLEDGE/SKILL
1-5-5.	Describe the function, use, and format of the tapes and disks utilized by the Gun Computer System (GCS) MK 160.
1-5-6.	Describe the personnel and equipment safety precautions that are to be observed during operation of the Gun Computer System (GCS) MK 160.
1-6.	MAINTENANCE DESCRIPTION
1-6-1.	Define the maintenance philosophy for the Gun Computer System (GCS) MK 160. Include maintenance policy and management plan. a. Preventive maintenance b. Corrective maintenance
1-6-2.	Describe the preventive maintenance procedures contained in prescribed maintenance documentation for the Gun Computer System (GCS) MK 160.
1-6-3.	Describe the operational tests and diagnostic programs contained in prescribed maintenance documentation for the Gun Computer System (GCS) MK 160.
1-6-4.	Describe the recognition and interpretation of malfunction indications of the Gun Computer System (GCS) MK 160.
1-6-5.	Describe the systematic fault isolation procedures contained in prescribed maintenance documentation for the Gun Computer System (GCS) MK 160.
1-6-6.	Describe the disassembly, repair, and reassembly procedures contained in prescribed maintenance documentation for the Gun Computer System (GCS) MK 160.
1-6-7.	Describe the post-repair procedures contained in prescribed maintenance documentation for the Gun Computer System (GCS) MK 160.
1-6-8.	Describe alignment, adjustment, and calibration procedures for the Gun Computer System (GCS) MK 160.
1-6-9.	Describe the personnel and equipment safety precautions that are to be observed during maintenance of the Gun Computer System (GCS) MK 160.
1-7.	DOCUMENTATION DESCRIPTION
1-7-1.	Describe the organization, content, and use of the technical documentation provided with the Gun Computer System (GCS) MK 160. a. SW224-A4-MMO-010

ITEM NO.	KNOWLEDGE/SKILL
	b. SW224-A4-MMO-020 c. SW224-A4-MMO-A10 d. SW224-A9-MMO-010 e. SW224-A9-MMO-020 f. SW224-BX-MMO-010 g. SW224-BX-MMO-020

Table S1274. Gun Computer System (GCS) MK 160 (Continued)

ITEM NO.	KNOWLEDGE/SKILL
2.	SUBSYSTEM SKILLS
2-1.	OPERATION
2-1-1.	Perform the tasks/procedures for operating the Gun Computer System (GCS) MK 160. a. Pre-operational tasks/procedures b. Operational tasks/procedures c. Post-operational tasks/procedures
2-1-2.	Recognize and interpret the indications that occur during operation of the Gun Computer System (GCS) MK 160.
2-1-3.	Perform the Gun Computer System (GCS) MK 160 casualty, degraded, and abnormal mode/s of operation.
2-1-4.	Recognize and interpret the function, use, and format of the tapes and disks utilized by the Gun Computer System (GCS) MK 160.
2-1-5.	Adhere to personnel and equipment safety precautions during operation of the Gun Computer System (GCS) MK 160.
2-2.	MAINTENANCE
2-2-1.	Perform the preventive maintenance procedures for the Gun Computer System (GCS) MK 160 as scheduled by the Planned Maintenance System (PMS).
2-2-2.	Perform the operational tests and diagnostic programs for the Gun Computer System (GCS) MK 160.
2-2-3.	Recognize and interpret the malfunction indications of the Gun Computer System (GCS) MK 160.
2-2-4.	Perform the systematic fault isolation procedures for the Gun Computer System (GCS) MK 160.
2-2-5.	Perform the procedures to disassemble, repair and reassemble the Gun Computer System (GCS) MK 160 to the authorized maintenance level.
2-2-6.	Perform the post-repair procedures for the Gun Computer System (GCS) MK 160.

Table S1274. Gun Computer System (GCS) MK 160 (Continued)

ITEM NO.	KNOWLEDGE/SKILL
2-2-7.	Perform alignment, adjustment, and calibration procedures for the Gun Computer System (GCS) MK 160.
2-2-8.	Adhere to personnel and equipment safety precautions during maintenance of the Gun Computer System (GCS) MK 160.

SYSTEM PPP

TABLE EXAMPLE

PERSONNEL PERFORMANCE PROFILE

TABLE S1273

Gun Weapon System (GWS) MK 34

(SYSTEM LEVEL)

5/5/2009

SYSTEM MODIFICATION RECORD

SHIPALT 12345

NEW DESIGN - DRAWING NUMBER

DWG 98765

Table S1273. Gun Weapon System (GWS) MK 34

ITEM NO.	KNOWLEDGE/SKILL
1.	SYSTEM KNOWLEDGE
1-1.	GENERAL DESCRIPTION
1-1-1.	State the purpose of the Gun Weapon System (GWS) MK 34.
1-1-2.	State the purpose of the major components of the Gun Weapon System (GWS) MK 34. a. Gun Computer System (GCS) MK 160 b. Optical Sight System (OSS) MK 46 c. Gun System MK 45
1-1-3.	Define the abbreviations, terms, and symbols used with the Gun Weapon System (GWS) MK 34.
1-1-4.	State the operational characteristics and capabilities of the Gun Weapon System (GWS) MK 34.
1-1-5.	Describe the modification differences of the Gun Weapon System (GWS) MK 34.
1-1-6.	State the security requirements of the Gun Weapon System (GWS) MK 34.
1-2.	PHYSICAL DESCRIPTION
1-2-1.	Describe the major components of the Gun Weapon System (GWS) MK 34. Include name, nomenclature, physical appearance, reference designators, and location. a. Gun Computer System (GCS) MK 160 b. Optical Sight System (OSS) MK 46 c. Gun System MK 45
1-2-2.	Describe the controls, displays, indicators, and alarms of the Gun Weapon System (GWS) MK 34. Include location and positions.
1-3.	FUNCTIONAL DESCRIPTION
1-3-1.	Describe the functional operation of the Gun Weapon System (GWS) MK 34. Include types of signals, signal flow, signal/data format, sequential operation, indications, and inputs and outputs.
1-3-2.	Describe the function of the controls, displays, indicators, and alarms of the Gun Weapon System (GWS) MK 34. Include positions and colors.

Table S1273. Gun Weapon System (GWS) MK 34 (Continued)

ITEM NO.	KNOWLEDGE/SKILL
1-4.	INTERFACE DESCRIPTION
1-4-1.	Describe the physical interface between the Gun Weapon System (GWS) MK 34 and related external equipment. Include name, physical appearance, reference designators, and locations of cable routings, junction boxes, switchboard connections, and cable terminations.
1-4-2.	Describe the functional interface between the Gun Weapon System (GWS) MK 34 and related external equipment. a. Electrical b. Electronic
1-5.	OPERATIONAL DESCRIPTION
1-5-1.	Describe the authority and regulations pertaining to the operation of the Gun Weapon System (GWS) MK 34.
1-5-2.	Describe the tasks/procedures to be performed when operating the Gun Weapon System (GWS) MK 34. a. Pre-operational tasks/procedures b. Operational tasks/procedures c. Post-operational tasks/procedures
1-5-3.	Describe the recognition and interpretation of the indications that should or may occur during the operation of the Gun Weapon System (GWS) MK 34. Include the displays, indicators, alarms, and readouts.
1-5-4.	Describe the Gun Weapon System (GWS) MK 34 casualty, degraded, and abnormal mode/s of operation.
1-5-5.	Describe the function, use, and format of the tapes and disks utilized by the Gun Weapon System (GWS) MK 34.
1-5-6.	Describe the personnel and equipment safety precautions that are to be observed during operation of the Gun Weapon System (GWS) MK 34.
1-6.	MAINTENANCE DESCRIPTION
1-6-1.	Define the maintenance philosophy for the Gun Weapon System (GWS) MK 34. Include maintenance policy and management plan. a. Preventive maintenance b. Corrective maintenance

Table S1273. Gun Weapon System (GWS) MK 34 (Continued)

ITEM NO.	KNOWLEDGE/SKILL
1-6-2.	Describe the preventive maintenance procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34.
1-6-3.	Describe the operational tests and diagnostic programs contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34.
1-6-4.	Describe the recognition and interpretation of malfunction indications of the Gun Weapon System (GWS) MK 34.
1-6-5.	Describe the systematic fault isolation procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34.
1-6-6.	Describe the disassembly, repair, and reassembly procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34.
1-6-7.	Describe the post-repair procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34.
1-6-8.	Describe alignment, adjustment, and calibration procedures for the Gun Weapon System (GWS) MK 34.
1-6-9.	Describe the personnel and equipment safety precautions that are to be observed during maintenance of the Gun Weapon System (GWS) MK 34.
1-7.	DOCUMENTATION DESCRIPTION
1-7-1.	Describe the organization, content, and use of the technical documentation provided with the Gun Weapon System (GWS) MK 34. a. SW221-AD-MMO-010 b. SW221-AD-MMO-A10 c. SW221-A2-MMO-010 d. SW221-A3-MMO-010

Table S1273. Gun Weapon System (GWS) MK 34 (Continued)

ITEM NO.	KNOWLEDGE/SKILL
2.	SYSTEM SKILLS
2-1.	OPERATION
2-1-1.	Perform the tasks/procedures for operating the Gun Weapon System (GWS) MK 34. a. Pre-operational tasks/procedures b. Operational tasks/procedures c. Post-operational tasks/procedures
2-1-2.	Recognize and interpret the indications that occur during operation of the Gun Weapon System (GWS) MK 34.
2-1-3.	Perform the Gun Weapon System (GWS) MK 34 casualty, degraded, and abnormal mode/s of operation.
2-1-4.	Recognize and interpret the function, use, and format of the tapes and disks utilized by the Gun Weapon System (GWS) MK 34.
2-1-5.	Adhere to personnel and equipment safety precautions during operation of the Gun Weapon System (GWS) MK 34.
2-2.	MAINTENANCE
2-2-1.	Perform the preventive maintenance procedures for the Gun Weapon System (GWS) MK 34 as scheduled by the Planned Maintenance System (PMS).
2-2-2.	Perform the operational tests and diagnostic programs for the Gun Weapon System (GWS) MK 34.
2-2-3.	Recognize and interpret the malfunction indications of the Gun Weapon System (GWS) MK 34.
2-2-4.	Perform the systematic fault isolation procedures for the Gun Weapon System (GWS) MK 34.
2-2-5.	Perform the procedures to disassemble, repair and reassemble the Gun Weapon System (GWS) MK 34 to the authorized maintenance level.
2-2-6.	Perform the post-repair procedures for the Gun Weapon System (GWS) MK 34.
2-2-7.	Perform alignment, adjustment, and calibration procedures for the Gun Weapon System (GWS) MK 34.

ITEM NO.	KNOWLEDGE/SKILL
2-2-8.	Adhere to personnel and equipment safety precautions during maintenance of the Gun Weapon System (GWS) MK 34.

TASK/FUNCTION PPP

TABLE EXAMPLE

PERSONNEL PERFORMANCE PROFILE

TABLE B0772

Authoring Instructional Materials (AIM I) Personnel Performance Profile
(PPP) Based Training Materials Development and Maintenance

(TASK/FUNCTION KNOWLEDGE AND SKILL)

2/28/2007

SYSTEM/SUBSYSTEM/EQUIPMENT MODIFICATION RECORD

AIM I Software Version

DRAFT

Rev B B0772-1/B0772-2

Table B0772. Authoring Instructional Materials (AIM I) Personnel Performance Profile (PPP)
Based Training Materials Development and Maintenance

ITEM NO.	KNOWLEDGE/SKILL
1.	KNOWLEDGE
1-1.	GENERAL
1-1-1.	State the purpose of Authoring Instructional Materials (AIM I) software.
1-1-2.	Describe authority and regulations for use of the AIM I system.
1-1-3.	Describe the philosophy for developing Sections, Lessons, Modules, and Course in accordance with ILE policies and guidance using the Learning Object Module.
1-1-4.	Describe the philosophy of PPP based training material in accordance with NAVEDTRA 131A and 135. a. Training Project Plans b. Personnel Performance Profile (PPP) Tables c. Training Path Systems d. Training Course Control Documents (TCCD) e. Lesson Plans f. Trainee Guides g. Stages of Development h. Training Material Change and Revision Criteria
1-1-5.	Define the terms, abbreviations, and acronyms associated with AIM I.
1-1-6.	Describe the organization, content, and use of AIM I Software User's Manual.
1-1-7.	Describe the text editing methods, capabilities, and keyboard hot keys for AIM I.
1-1-8.	Describe the printed products of AIM I and the procedures for printing to a printer, print preview, and save as PDF.
1-1-9.	Describe indications that should or may occur during operation of the AIM system.
1-1-10.	Describe methods to access the AIM I software.
1-1-11.	Describe the AIM I software conventions.
1-1-12.	Describe training materials status.
1-1-13.	Describe user privilege levels.

ITEM NO.	KNOWLEDGE/SKILL
1-1-14.	Describe AIM I system and data security requirements.
1-1-15.	Describe personnel and equipment safety precautions during operation of the AIM I system.
1-1-16.	Describe the functional modules of AIM I. a. Administration and Utilities b. Training Project Plans c. Personnel Performance Profiles d. Training Path Systems e. Training Course Control Documents f. Lesson Plans g. Trainee Guides h. Sharable Content Object Reference Model (SCORM) i. Test Module
1-1-17.	Describe the personnel associated with AIM I software. a. AIM Administrator b. AIM User
1-1-18.	Describe the software links between the functional modules of AIM I.
1-1-19.	Describe the functions of the AIM System Support Office (SSO).
1-2.	TRAINING MATERIAL DEVELOPMENT

1-2-1.	Describe the procedures to create a Training Project Plan (TPP).
	a. TPP Cover Page
	b. Contents Menu Item
	  (1) Compensation Manpower and Funding
	  (2) Course Overview/Comments
	  (3) Course Status
	  (4) Development Method
	  (5) Justification
	  (6) Milestones
	  (7) Safety Risks and Hazardous Materials
	  (8) Summary of Differences
	  (9) Training Sites
	    (a) Course Data
	    (b) Site Considerations

Table B0772. Authoring Instructional Materials (AIM I) Personnel Performance Profile (PPP) Based Training Materials Development and Maintenance (Continued)

ITEM NO.	KNOWLEDGE/SKILL
	(c) RRL including Facility, Funding, Manpower and Training Material Items.
1-2-2.	Describe procedures to create a Personnel Performance Profile (PPP) table. a. Equipment/Subsystem/System b. Task/Function c. Background
1-2-3.	Describe procedures to create a Training Path System (TPS). a. TPS Cover Page b. TPS Introduction c. TPS Task Sets d. Training Path Chart (TPC) Cover Page e. Training Level Assignments (TLAs) f. Course List
1-2-4.	Describe the procedures to create a Training Course Control Document (TCCD). a. Foreword b. Course Data c. Trainee Data d. Curriculum Outline of Instruction (COI) (1) Training Requirements (2) Parts (3) Sections (4) Topics (5) Topic Learning Objectives (TLOs) (6) Course Learning Objectives (CLOs) e. Annexes (1) Profile Item-to-Topic Objective Assignment Chart (OAC) (2) Resource Requirements List (RRL) (3) Course Master Schedule (CMS) (4) Fault Applicability List (FAL)
1-2-5.	Describe procedures to create a Lesson Plan (LP). a. LP Cover Page (1) How to Use the Lesson Plan (2) Safety/Hazard Awareness Notice (3) Security Awareness Notice (4) Fault Applicability List (FAL)

ITEM NO.	KNOWLEDGE/SKILL
	(5) Allocation of Instructional Time (AOIT) b. Resource Requirements List (RRL) c. Topics - Trainee Preparation and Topic Time d. Discussion Point (DP) Outline e. Related Instructor Activities (RIAs) to include, but not limited to: 　(1) RRL item selection 　(2) Before text selection 　(3) Fault selection f. Answer Sheets
1-2-6.	Describe procedures to create a Trainee Guide (TG). a. TG Cover Page 　(1) How to Use the Guide 　(2) Safety/Hazard Awareness Notice 　(3) Security Awareness notice b. Instruction Sheets c. Graphics operations d. Editors 　(1) High Edit 　(2) Word 　(3) Styled Text Editor
1-2-7.	Describe the procedures to create test items, tests, and test administration materials for a course.
1-3.	TRAINING MATERIAL MAINTENANCE
1-3-1.	Describe procedures for performing maintenance on AIM I developed training materials. a. PPP Table 　(1) Changes 　(2) Revisions b. TPS 　(1) Changes 　(2) Revisions c. TCCD 　(1) Changes 　(2) Revisions d. LP 　(1) Changes

Table B0772. Authoring Instructional Materials (AIM I) Personnel Performance Profile (PPP) Based Training Materials Development and Maintenance (Continued)

ITEM NO.	KNOWLEDGE/SKILL

	(2) Revisions
	    e. TG
	      (1) Changes
	      (2) Revisions
	    f. Test Items
	      (1) Unapprove
	      (2) Approve

1-3-2.	Describe the purpose and use of AIM I flags. a. System generated flags (@) b. Maintenance action flags (X) c. Interactive Multimedia Instructions (IMI) flags.
1-4.	ADMINISTRATION/UTILITIES
1-4-1.	Describe AIM I User Administration.
1-4-2.	Describe AIM I Password Administration
1-4-3.	Describe AIM I Admin Administration.
1-4-4.	Describe the Training Site Administration.
1-4-5.	Describe the Agency Administration.
1-4-6.	Describe AIM I Import/Export functions.
1-4-7.	Describe AIM I Delete Proposed Training Material Utility.
1-4-8.	Describe AIM I PPP/TPS Relink Utility
1-4-9.	Describe AIM I Data Manager Utility.
1-4-10.	Describe Site RRL Administration.
1-4-11.	Describe Reporting Administration
1-4-12.	Describe RRL/Graphics Location Tool Administration
1-4-13.	Describe the AIM I Graphics utility and management functions to include, but not limited to, the following: a. Add/Modify/Replace a graphic b. Delete a graphic c. Title a graphic

Table B0772. Authoring Instructional Materials (AIM I) Personnel Performance Profile (PPP) Based Training Materials Development and Maintenance (Continued)

ITEM NO.	KNOWLEDGE/SKILL
1-4-14.	Describe the procedures to Archive/Unarchive training material in AIM I.
1-4-15.	Describe the procedures to delete proposed training material in AIM I.
1-4-16.	Describe the procedures to identify related materials for RRL items using the AIM I Management Functions.
1-4-17.	Describe the recognition and interpretation of malfunction indications which can occur during operation of the AIM I system.
1-4-18.	Describe AIM I data logging and reporting requirements.
1-5.	TRAINING MATERIAL MANAGEMENT
1-5-1.	Describe training material configuration management for review and approval of newly developed materials, revisions, and changes in accordance with current directives.
1-5-2.	Describe training material configuration management involving multiple AIM I sites.
1-5-3.	Describe responsibilities for clearing System amd Maintenance generated flags.
1-5-4.	Describe Site RRL and Graphics management.
1-5-5.	Describe AIM I user and privilege management responsibilities.

Table B0772. Authoring Instructional Materials (AIM I) Personnel Performance Profile (PPP) Based Training Materials Development and Maintenance (Continued)

ITEM NO.	KNOWLEDGE/SKILL
2.	SKILLS
2-1.	GENERAL
2-1-1.	Recognize and interpret indications that should or may occur during operation of the AIM I system.
2-1-2.	Use AIM I Software User's Manuals and other technical documentation in support of AIM operations.
2-1-3.	Perform text editing.
2-1-4.	Perform procedures for printing, print prievewing, and saving AIM I materials as PDF files.
2-1-5.	Perform AIM I software access.
2-1-6.	Grant user privileges.
2-1-7.	Adhere to personnel and equipment safety precautions during operation of the AIM I system.
2-2.	ILE TRAINING MATERIAL DEVELOPMENT
2-2-1.	Create a Section from existing AIM I data.
2-2-2.	Create a Lesson.
2-2-3.	Create a Module.
2-2-4.	Create a Course.
2-3.	FORMAL CLASSROOM TRAINING MATERIAL DEVELOPMENT
2-3-1.	Create a TPP.
2-3-2.	Create a PPP table.
2-3-3.	Create a TPS.
2-3-4.	Create a TCCD.
2-3-5.	Create an LP.
2-3-6.	Create a TG.

Table B0772. Authoring Instructional Materials (AIM I) Personnel Performance Profile (PPP)
Based Training Materials Development and Maintenance (Continued)

ITEM NO.	KNOWLEDGE/SKILL
2-3-7.	Create a SCORM output file.
2-3-8.	Create test item, test, and Administation support documentation for a course.
2-4.	TRAINING MATERIAL MAINTENANCE
2-4-1.	Perform maintenance on AIM I developed training materials. a. PPP Table Change b. PPP Table Revision c. TPS Change d. TPS Revision e. TCCD Change f. TCCD Revision g. LP Change h. LP Revision i. TG Change j. TG Revision
2-4-2.	Perform training materials modifications as indicated by AIM I system generated flags.
2-4-3.	Recognize and interpret malfunction indications which can occur during operation of the AIM I system.
2-4-4.	Perform data logging and reporting.
2-5.	ADMINISTRATION/UTILITIES
2-5-1.	Perform AIM I User Administration.
2-5-2.	Perform AIM I Admin Administration.
2-5-3.	Perform Training Site Administration.
2-5-4.	Perform Agency Administration.
2-5-5.	Perform Import/Export operations.
2-5-6.	Perform AIM I Printer Administration.
2-5-7.	Perform AIM I Data Manager Utilities.
2-5-8.	Perform AIM I Site RRL Administration.

Table B0772. Authoring Instructional Materials (AIM I) Personnel Performance Profile (PPP)
Based Training Materials Development and Maintenance (Continued)

ITEM NO.	KNOWLEDGE/SKILL
2-5-9.	Perform AIM I Graphics operations.
2-5-10.	Perfrom Archive/Unarchive operations.
2-5-11.	Perform the operations of deleting proposed training material in AIM I.
2-5-12.	Perform the operations to approve training materials in AIM I.
2-5-13.	Perform the operations of the AIM I Maintenance Fuctions utility to identify the elements of a LP/TG which are effected by changes made to existing RRL items.
2-5-14.	Perform PPP/TPS Relink operations.
2-5-15.	Generate pre-formatted and adhoc reports.
2-5-16.	Locate RRL/Graphics using the RRL/Graphics Location Tool.
2-6.	TRAINING MATERIAL MANAGEMENT
2-6-1.	Perform training material configuration management for review and approval of revisions and changes in accordance with current directives.
2-6-2.	Coordinate training materials configuration management involving multiple AIM I sites.
2-6-3.	Review training material for maintenance actions required as indicated by AIM I system and user Maintenance flags.
2-6-4.	Coordinate archive/unarchive training materials in the AIM I system.

BACKGROUND PPP

TABLE EXAMPLE

PERSONNEL PERFORMANCE PROFILE

TABLE A0004

Basic Electronics

(BACKGROUND KNOWLEDGE AND SKILL)

7/19/1993

NEW DESIGN - DRAWING NUMBER

None

Table A0004. Basic Electronics

ITEM NO.	KNOWLEDGE/SKILL
1.	KNOWLEDGE
1-1.	Define the terms, abbreviations, and symbols associated with basic electronics.
1-2.	Describe the theory and construction features of semiconductors. a. Diode b. Silicon-Controlled rectifier c. Transistor d. Field Effect transistors e. Unijunction transistor f. Integrated circuits (chips)
1-3.	Describe the operating characteristics of semiconductors.
1-4.	Describe the following types of transistor amplifiers and bias classifications: a. Types 　(1) Operational 　(2) Audio 　(3) Turned b. Bias classifications 　(1) A 　(2) B 　(3) AB 　(4) C
1-5.	Describe the operation of transistor amplifiers connected in one of the three basic configurations. Include relative advantages of each configuration. a. Common Emitter b. Common Base c. Common Collector
1-6.	Describe the theory and operation of basic types of oscillator circuits.
1-7.	Describe the operation and characteristics of particular oscillators. Include equivalent circuits and types of feedback circuits used in each of the following: a. Armstrong b. Hartley c. Colpitts d. Multivibrator

ITEM NO.	KNOWLEDGE/SKILL
	(1) Monostable (2) Bistable (3) Astable e. Blocking f. Unijunction g. Crystal h. Resistance-capacitance
1-8.	(deleted)
1-9.	Describe the theory and operating characteristics of semiconductor gating circuits.
1-10.	Describe the theory and construction features of electron tubes. a. Vacuum b. Gas filled
1-11.	Describe the electron tube operating characteristics, including the function of additional elements in multi-element tubes. a. Diode b. Triode c. Multi-element tubes d. (deleted) e. Gas filled tubes f. Cathode-ray tubes
1-12.	Describe the functional characteristics of a cathode-ray tube.
1-13.	(deleted)
1-14.	Describe the theory and operation of series- and parallel-tuned circuits.
1-15.	Describe the typical applications of tuned circuits.
1-16.	Describe the types and causes of distortion observed in amplifiers. a. Frequency b. Phase c. Amplitude
1-17.	Describe the basic coupling methods utilized in amplifiers. a. Resistance-capacitance b. Impedance

ITEM NO.	KNOWLEDGE/SKILL
	c. Transformer d. Direct
1-18.	Describe the operation of typical electron type amplifiers. Include the methods of biasing and the method of determining amplifier gain.
1-19.	Describe the operation of an audio power amplifier. Include equivalent circuits and methods of determining power output. a. Class A b. Push-pull
1-20.	Describe the physical construction and basic operation of magnetic amplifiers.
1-21.	Describe the circuit operation of a magnetic amplifier. a. Cores b. Feedback c. Biasing
1-22.	Describe decibels as related to power, current, and voltage ratios.
1-23.	(deleted)
1-24.	(deleted)
1-25.	(deleted)
1-26.	(deleted)

1-27.	State the circuits which comprise a basic power supply.
	a. Rectifiers
	   (1) Half-wave
	   (2) Full-wave
	   (3) Bridge
	b. Filters (capacitive/inductive)
	c. Regulators
	   (1) Zener diode
	   (2) Electronic
	d. Voltage divider
	e. Voltage multiplier

1-28.	Describe the operation of a basic power supply. Include common types of failures and resulting effects.

ITEM NO.	KNOWLEDGE/SKILL
1-29.	(deleted)
1-30.	Define types of modulation. a. Amplitude b. Frequency c. Phase d. Pulse
1-31.	Describe the operation of each type of modulator. Include the method of determining the degree of modulation. a. Amplitude b. Frequency c. Phase d. Pulse

1-32.	Describe the operation and characteristics of demodulators.
	a. AM demodulators
	  (1) Diode detector
	  (2) Regenerative detector
	  (3) Heterodyne detector
	b. FM demodulators
	  (1) Slope detector
	  (2) Discriminator
	  (3) Ratio detector

1-33.	Describe basic configuration of a Continuous Wave (CW) transmitter. a. Oscillator b. Buffer amplifier c. Power amplifier d. Keyer e. Antenna f. Power supply g. Frequency multiplier
1-34.	Describe the operation of a CW transmitter. Include the methods of keying and common types of failures and resulting effects.
1-35.	Describe the operation of amplitude modulated transmitters. Include common types of failures and resulting effects.
1-36.	Describe the characteristics of transmission lines.

Table A0004. Basic Electronics (Continued)

ITEM NO.	KNOWLEDGE/SKILL
	a. Characteristic impedance b. Standing wave length c. Electrical length
1-37.	State the types transmission lines used. a. Parallel two-wire line b. Twisted pair c. Shielded pair d. Solid coaxial e. Air coaxial f. Waveguides
1-38.	Define basic antenna principles. a. Electrical length b. Radiation impedance c. Wave polarization
1-39.	State the two basic types of radio antennas and the differences between them. a. Hertz b. Marconi
1-40.	Describe the types of radio waves and the atmospheric conditions that affect their propagation. a. Ground wave b. Sky wave
1-41.	(deleted)
1-42.	Describe the basic configuration and general operation of the super-heterodyne receiver. a. Antenna b. RF amplifier c. Mixer and local oscillator d. IF amplifier e. Detector f. AF amplifier g. Speaker
1-43.	(deleted)
1-44.	(deleted)

ITEM NO.	KNOWLEDGE/SKILL
1-45.	(deleted)
1-46.	(deleted)
1-47.	Describe the purpose, application, operation, and characteristics of the following electronic special circuits: a. Limiting circuits b. Differentiating circuits c. Integrating circuits d. Clamping circuits e. Counting circuits f. Phase shift circuits g. Automatic gain control circuits h. Automatic frequency control circuits i. Bridge circuits j. Frequency compensation circuits k. Integrated circuits l. Trigger circuits m. Pulse circuits n. Temperature compensation circuits
1-48.	(deleted)
1-49.	State the purpose, general operation, and characteristics of the following test equipment. a. Oscilloscope b. Frequency standard c. Signal generator d. Spectrum analyzer e. Capacitance-inductance-resistance bridges f. Tube tester g. Analog multimeter h. VTVM i. Digital voltmeter j. Electronic/Frequency counter k. Wattmeter l. Frequency meter m. Phase angle voltmeter n. Megohmmeter o. Logic probe

ITEM NO.	KNOWLEDGE/SKILL
	p. Current probe q. Digital multimeter r. Differential voltmeter s. True RMS voltmeter t. DC power supply u. RF voltmeter
1-50.	Describe the use and content of standard Navy technical manuals.
1-51.	Describe the types of diagrams utilized in describing electronic equipment. a. Block diagram b. Timing diagram c. Schematic diagram d. (deleted) e. Wiring diagram
1-52.	(deleted)
1-53.	Describe the safety precautions that should be observed when working with electronic equipment and components including ESD.
1-54.	Describe the basic configuration and general operation of the following sound devices: a. Microphone b. Speaker
1-55.	Describe the characteristics and applications of readout display devices.
1-56.	Describe the procedures and techniques for performing basic maintenance tasks including: a. Crimping b. Splicing c. Soldering d. Removing and installing components on a basic circuit board e. Wire-wrap
1-57.	Describe the six-step troubleshooting procedure.

ITEM NO.	KNOWLEDGE/SKILL
2.	SKILLS
2-1.	Analyze the operation of the following circuits. Include the organization of components and their functions. a. Amplifiers b. Oscillators c. Power supplies d. Modulators e. Demodulators f. Limiting circuits g. Differentiating and integrating circuits h. Clamping circuits i. Phase shifters j. Counting circuits k. AGC circuits l. AFC circuits m. Bridge circuits n. Frequency compensation circuits o. Trigger circuits p. Pulse circuits q. Integrated circuits r. Temperature compensation circuits
2-2.	Analyze the operation of a basic transmitter. a. AM transmitter b. (deleted) c. CW transmitter
2-3.	Analyze the operation of a basic receiver. a. T.R.F. receiver b. Superheterodyne
2-4.	(deleted)
2-5.	Diagnose common electronic faults using applicable publications.
2-6.	(deleted)
2-7.	Use basic test equipment. a. Oscilloscope b. Frequency standard

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ITEM NO.	KNOWLEDGE/SKILL
	c. Signal generator d. Spectrum analyzer e. Capacitance-inductance-resistance bridges f. Tube tester g. Analog multimeter h. VTVM i. Digital voltmeter j. Electronic/Frequency counter k. Wattmeter l. Frequency meter m. Phase angle voltmeter n. Megohmmeter o. Logic probe p. Current probe q. Digital multimeter r. Differential voltmeter s. True RMS voltmeter t. DC power supply u. RF voltmeter
2-8.	Perform basic maintenance tasks including: a. Crimping b. Removing and installing components on a circuit board c. Soldering d. Splicing e. Wire-wrap
2-9.	Perform basic adjustment and alignment procedures on basic and special electronic circuits.
2-10.	Observe safety precautions when working with electronic equipment.
2-11.	Construct and operate transistor amplifiers connected in the following basic configurations: a. Common Emitter b. Common Base c. Common Collector
2-12.	Construct and operate typical oscillators.

ITEM NO.	KNOWLEDGE/SKILL
2-13.	Construct and operate series- and parallel-tuned circuits to fulfill specific frequency and input/output requirements.
2-14.	Construct and operate typical amplifiers, identifying biasing methods and determining amplifier stage gains. a. Transistor b. Vacuum tubes
2-15.	Determine decibels as used with power, current, and voltage ratios.
2-16.	Assemble and operate a typical basic power supply, detecting common types of failures and circuit effects.
2-17.	Operate a basic CW transmitter utilizing common methods of keying, and recognize common types of failures and resulting circuit effects.
2-18.	Operate basic AM transmitters. Identify common types of failures and the resulting circuit effects.
2-19.	Solve problems typical to the use and construction of transmission lines including: a. Characteristic impedance b. Standing wave ratio c. Wave polarization
2-20.	Solve problems in basic antenna analysis with respect to: a. Electrical length b. Radiation impedance c. Wave polarization
2-21.	Troubleshoot circuits using the six-step troubleshooting procedure.

TAB A-3

TRAINING PATH SYSTEM

Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course

TRAINING PATH SYSTEM
REPORT

PREPARED FOR

Center for Surface Combat Systems (CSCS) Dahlgren
5395 First St. Dahlgren, VA 22448

PREPARED BY

PEO IWS3C
Crystal Center, 2450 Crystal Drive, Arlington, VA 22202-3843

Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course

LIST OF EFFECTIVE ELEMENTS

Element No.	Change In Effect	Element No.	Change In Effect
TPS Cover Page	Original		
List of Effective Elements	Original		
TPS Introduction	Original		
TPC 331 Cover Page	Original		
TAC	Original		
Curricula Index	Original		
PPP Table Index	Original		
TAM	Original		
TLA S1273	Original		
TLA S1274	Original		
TLA S1277	Original		
TLA S2789	Original		
TLA S3706	Original		
TLA S4291	Original		
TLA S4292	Original		

TRAINING PATH SYSTEM
INTRODUCTION

Introduction.

The Introduction provides an explanation of the items that comprise the Training Path System (TPS) report. The introduction can be tailored to the specific training situation. The TPS includes Training Objective Statements (TOS), Training Path Chart (TPC), and Training Level Assignments (TLAs).

Training Objective Statements (TOS).

The TOS describe knowledge and skills to be obtained and define the depth of coverage required for each Personnel Performance Profile (PPP) line item selected. TOS are canned statements which can be modified to describe the various levels and types of job-related training. TOS within a task set are assigned an alphanumeric code. The numeric portion of the code indicates the level of coverage of the knowledge or skill. Higher numbers normally indicate increasing depths of knowledge or skill performance.

    a.   TOS are grouped into training objective "Task Sets". Each task set describes the training for a different category of personnel, according to their occupational specialty. Task sets are provided for personnel who either:

        (1) Coordinate,

        (2) Direct, or

        (3) Perform.

    b.   Within each task set, TOS are provided to describe the different skills, their performance levels, and the types and levels of knowledge to support the skills, as performed by a personnel category. The number of TOS varies with each task set.

    c.   Individual TOS within a task set are assigned an alphanumeric code. The numeric portion of the code indicates level of coverage of the knowledge or skill. Higher numbers normally indicate increasing depths of knowledge or skill performance. The TOS codes are as follows:

COORDINATE TASK SET

    T0 TOS Category - Includes:

      S - Background Skill
      B1 - Background Knowledge
      B2 - Background Comprehension
      J - Task/Function Skill
      Q - Task/Function Knowledge

    Equipment, Subsystem, and System (ESS) Category - Includes;

F1 - Knowledge
O1 - Skill
T1 - Knowledge

DIRECT TASK SET

T0 TOS Category - Includes:

S - Background Skill
B1 - Background Knowledge
B2 - Background Comprehension
J - Task/Function Skill
Q - Task/Function Knowledge

ESS Category - Includes;

F1 - ESS Familiarization Knowledge
O1 - Normal Operation Skill
O2 - Abnormal and Casualty Operation Skill
M1 - Maintenance Skill
T1 - Knowledge
T2 - Knowledge

PERFORM TASK SET

T0 TOS Category - Includes:

S - Background Skill
B1 - Background Knowledge
B2 - Background Comprehension
J - Task/Function Skill
Q - Task/Function Knowledge

ESS Category - Includes;

F1 - ESS Familiarization Knowledge
O1 - Normal Operation Skill
O2 - Abnormal and Casualty Operation Skill
P1 - Maintenance Skill
C1 - Maintenance Skill
C2 - Maintenance Skill
C3 - Maintenance Skill
T1 - Knowledge
T2 - Knowledge
T3 - Knowledge

Training Level Assignment.

The TLA is a tabular presentation by PPP table number which consists of a left-hand column containing PPP item numbers and right-hand columns headed by TOS code. The placement of TOS code applicability indicator in the TOS column opposite a PPP table item denotes the knowledge depth or skill level required of that item for specific personnel and defines the environment of the training required for the PPP item.

To support the training categories reflected on the Training Assignment Chart (TAC), each TPC is supported by TLAs which designate the TOS levels for each PPP table line item with applicability code characters R, A, B, 0, 1, 2, 3, 4, or 5. The characters are defined as follows:

R - Replacement/Conversion/ILM Training Courses

A - Advanced Training Course

B - Both Replacement and Advanced Training Course

0 - Training hardware does not exist at the appropriate facility and operational constraints precluded onboard training.

1 - Operational experience is the only means to accomplish the specified training level.

2 - Training hardware does not exist to accomplish training at the appropriate facility and onboard training is permitted.

3 - Training hardware exists to accomplish training at a facility; onboard training is permitted; and training is accomplished onboard.

4 - Training is received by the individual outside of the cognizant Training Program.

5 - Background training is received by the individual as a part of the Navy Training Program.

All PPP items are assigned within the TLA by PPP line item number and line subitem number, where required.

COORDINATE TASK SET

BACKGROUND SKILL/KNOWLEDGE TOS

S - Skill:

Completion of training provides the PREREQUISITE (Background), PHYSICAL or MENTAL Skills necessary to support follow-on training in COORDINATING operation or maintenance of a system, subsystem, or equipment, a task/function, or further background training

B1 & B2 - Knowledge:

Completion of training provides the knowledge required to support follow-on training in COORDINATING the operation or maintenance of a system, subsystem, or equipment, a task/function, or further background training

TASK/FUNCTION SKILL/KNOWLEDGE TOS

J - Skill:

Completion of training provides the PHYSICAL AND/OR MENTAL Skills required to COORDINATE the job or task/function

Q - Knowledge:

Completion of training provides the knowledge required to COORDINATE the job or task/function

ESS FAMILIARIZATION TOS

F1 - Knowledge:

Completion of training provides FAMILIARITY with the:

Purpose, operational concepts, location, capabilities, and limitations of a system/subsystem/equipment

Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

ESS OPERATION/MAINTENANCE SKILL TOS

O1 - Skill:

Completion of training provides the ability to coordinate operation and maintenance.

ESS OPERATION/MAINTENANCE KNOWLEDGE TOS

T1 - Knowledge:

Completion of training provides the knowledge to coordinate operation and maintenance:

Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

DIRECT TASK SET

BACKGROUND SKILL/KNOWLEDGE TOS

S - Skill:

Completion of training provides the PREREQUISITE (Background), PHYSICAL or MENTAL Skills necessary to support follow-on training in DIRECTING the operation or maintenance of a system, subsystem, or equipment, a task/function, or further background training

B1 & B2 - Knowledge:

Completion of training provides the knowledge required to support follow-on training in DIRECTING the operation or maintenance of a system, subsystem, or equipment, a task/function, or further background training

TASK/FUNCTION SKILL/KNOWLEDGE TOS

J - Skill:

Completion of training provides the PHYSICAL AND/OR MENTAL Skills required to DIRECT the job or task/function

Q - Knowledge:

Completion of training provides the knowledge required to DIRECT the job or task/function

ESS FAMILIARIZATION TOS

F1 - Knowledge:

Completion of training provides FAMILIARITY with the:

Purpose, operational concepts, location, capabilities and limitations of a system/subsystem/equipment

Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

ESS OPERATION/MAINTENANCE SKILL TOS

O1 - Skill:

Completion of training provides the ability to direct normal operations

O2 - Skill:

Completion of training provides the ability to direct:

Normal operations requiring advanced analysis

Abnormal operations (defined as casualty/degraded/not full mission capable)

M1 - Skill:

Completion of training provides the ability to direct maintenance

ESS OPERATION/MAINTENANCE KNOWLEDGE TOS

T1 - Knowledge:

Completion of training provides the knowledge to direct normal operations:

Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

T2 - Knowledge:

Completion of training provides the knowledge to direct:

Normal operations requiring advanced analysis

Abnormal operations (defined as casualty/degraded/not full mission capable)

Maintenance

PERFORM TASK SET

BACKGROUND SKILL/KNOWLEDGE TOS

S - Skill:

Completion of training provides the PREREQUISITE (Background), PHYSICAL or MENTAL Skills necessary to support follow-on training in PERFORMING the operation or maintenance of a system, subsystem, or equipment, a task/function, or further background training

B1 & B2 - Knowledge:

Completion of training provides the knowledge required to support follow-on training in PERFORMING the operation or maintenance of a system, subsystem, or equipment, a task/function, or further background training

TASK/FUNCTION SKILL/KNOWLEDGE TOS

J - Skill:

Completion of training provides the PHYSICAL AND/OR MENTAL Skills required to PERFORM the job or function

Q - Knowledge:

Completion of training provides the knowledge required to support the performance of the skills required to PERFORM the job or task/function

ESS FAMILIARIZATION TOS

F1 - Knowledge:

Completion of training provides FAMILIARITY with the:

Purpose, operational concepts, location, capabilities and limitations of a system/subsystem/equipment

Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

ESS OPERATION/MAINTENANCE SKILL TOS

O1 - Skill:

Completion of training provides the skill to perform normal operations

O2 - Skill:

Completion of training provides the skill to perform:

Normal operations requiring advanced analysis

Abnormal operations (defined as casualty/degraded/not full mission capable)

P1 - Skill:

Completion of training provides the skill to perform preventive maintenance

ESS OPERATION/MAINTENANCE SKILL TOS

C1 - Skill:

Completion of training provides the skill to perform to the authorized maintenance level, systematic fault isolation procedures

C2 - Skill:

Completion of training provides the skill to perform to the authorized maintenance level:

Systematic fault isolation procedures that require advanced analysis
Authorized techniques to isolate faults that cannot be isolated using procedures contained in prescribed documentation

C3 - Skill:

Completion of training provides the skill and knowledge to perform, without supervision:

Diagnosis of equipment malfunctions, fault isolation, and all repairs

This level of skill cannot be trained in the formal school setting. This skill is acquired only through on-the-job experience, and reflects a continuous learning process that is supported by the skills and knowledge taught in the formal school environment

The Training Level Assignment Applicability Indicator "1" will always be used to show this skill is acquired via "operational experience," i. e. , shipboard performance

ESS OPERATION/MAINTENANCE KNOWLEDGE TOS

T1 - Knowledge:

Completion of training provides the knowledge to perform normal operations:

Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

T2 - Knowledge:

Completion of training provides the knowledge to perform:

Normal operations requiring advanced analysis

Abnormal operations (defined as casualty/degraded/not full mission capable)

Preventive maintenance

Basic corrective maintenance

T3 - Knowledge:

Completion of training provides the knowledge to perform advanced corrective maintenance

Gun Computer System MK 160 MOD 8/Optical Sight System MK 46 MOD 1 Differences Course

TRAINING PATH CHART

331

NEC/NOBC: FC-1139

TABLE ASSIGNMENT CHART
for
Gun Computer System MK 160 MOD 8/Optical Sight System MK 46 MOD 1 Differences Course

(NEC/NOBC: FC-1139)   TPC - 331

TYPE	CIN	PPP Table	TOS Levels
A	A-113-0125	S1273	T1, T2, O1, O2, P1, C1
		S1274	T1, T2, O1, O2, P1, C1
		S1277	T1, T2, O1, P1
		S2789	T1, T2, O1, O2, P1, C1
		S3706	T1, T2, O1, O2, P1, C1
		S4291	T1, T2, O1
		S4292	T1, T2, O1, P1, C1

CURRICULA INDEX
for
Gun Computer System MK 160 MOD 8/Optical Sight System MK 46 MOD 1 Differences Course

(NEC/NOBC: FC-1139)   TPC - 331

Center for Surface Combat Systems (CSCS) Dahlgren Number	Title	TOS Levels
A-113-0125	Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course	T1, T2, O1, O2, P1, C1

PPP TABLE INDEX
for
Gun Computer System MK 160 MOD 8/Optical Sight System MK 46 MOD 1 Differences Course

(NEC/NOBC: FC-1139)   TPC - 331

S1273	Gun Weapon System (GWS) MK 34
S1274	Gun Computer System (GCS) MK 160
S1277	Gun Mount Control Panel (GMCP) MK 437
S2789	Optical Sight System (OSS) MK 46
S3706	Recorder Reproducer (RCRP) Set MK 27
S4291	Gun Console (GC)
S4292	Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)

TABLE ASSIGNMENT MATRIX
for
Gun Computer System MK 160 MOD 8/Optical Sight System MK 46 MOD 1 Differences Course

(NEC/NOBC: FC-1139)   TPC - 331

PPP Table	TOS Assignment													
	Level													
	B1	B2	Q	F1	T1	T2	T3	S	J	O1	O2	P1	C1	C2
S1273					X	X				X	X	X	X	
S1274					X	X				X	X	X	X	
S1277					X	X				X	X	X	X	
S2789					X	X				X	X	X	X	
S3706					X	X				X	X	X	X	
S4291					X	X				X	X	X		
S4292					X	X				X	X	X	X	

TRAINING LEVEL ASSIGNMENTS
for
Gun Computer System MK 160 MOD 8/Optical Sight System MK 46 MOD 1 Differences Course

(NEC/NOBC: FC-1139)   TPC - 331

ITEM	F1	T1	T2	T3	O1	O2	P1	C1	C2	C3
Table S1273										
Level										
1-1-1		A								
1-1-2		A								
1-1-2-a		A								
1-1-2-b		A								
1-1-2-c		A								
1-1-3		A								
1-1-4		A								
1-1-5		A								
1-1-6		A								
1-2-1		A								
1-2-2		A								
1-3-1		A								
1-3-2		A								
1-4-1		A								
1-4-2		A								
1-4-2-a		A								
1-4-2-b		A								
1-5-1		A								
1-5-2		A								
1-5-2-a		A								
1-5-2-b		A								
1-5-2-c		A								
1-5-3		A								
1-5-4			A							
1-5-5		A								
1-5-6		A	A							
1-6-1			A							
1-6-1-a			A							

A-3-18
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(NEC/NOBC: FC-1139)   TPC - 331

Table S1273 (Cont)									
	Level								
ITEM	**F1**	**T1**	**T2**	**T3**	**O1**	**O2**	**P1**	**C1**	**C2**	**C3**
1-6-1-b			A						
1-6-2			A						
1-6-3			A						
1-6-4			A						
1-6-5			A						
1-6-6			A						
1-6-7			A						
1-6-8			A						
1-6-9			A						
1-7-1		A							
1-7-1-a		A							
1-7-1-b		A							
1-7-1-c		A							
1-7-1-d		A							
2-1-1					A				
2-1-1-a					A				
2-1-1-b					A				
2-1-1-c					A				
2-1-2					A				
2-1-3						A			
2-1-4					A				
2-1-5					A	A			
2-2-1							A		
2-2-2								A	
2-2-3								A	
2-2-4								A	
2-2-5								A	
2-2-6								A	

TAB A-4

TRAINING COURSE CONTROL DOCUMENT

TRAINING COURSE CONTROL DOCUMENT

Place Holder for Letter Of Promulgation

A-4-2

TRAINING COURSE CONTROL DOCUMENT

Foreword

The foreword is not required, but serves as a place to explain to reviewers any unique aspects of the course, which may not be apparent from the basic data.

A-4-3

TRAINING COURSE CONTROL DOCUMENT

COURSE DATA

Course Title:

Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course

Course Identification Number (CIN):

A-113-0125

Course Data Processing Code (CDP) by Site: CDP

1.   Center for Surface Combat Systems (CSCS) Learning Detachment, Dam   582L
     Neck

Course Status:

New

Course Mission Statement:

To train E4-E8 Fire Controlmen the Operation and Maintenance on the Gun Computer System (GCS) MK 160 MOD 8 and Optical Sight System (OSS) MK 46 MOD1 differences at the Journeyman Level on DDG-81and newer hulls both import and underway with minimal supervision.

Occupational Classification/Prerequisites:

Occupational Classification - NEC FC-1139 will be awarded upon successful completion of the training.

Prerequisites:

1. Successful completion of the GCS MK 160 MOD 4&6/OSS MK 46 MOD 0 Operation and Maintenance Course (A-113-0131) (FC-1120)

2. Rating: Fire Controlman

3. Paygrade: E4 to E7

Course Overview:

The Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course (A-113-0125) is designed to provide the knowledge and practical skills necessary for FC-1139 personnel to operate and maintain these two systems on board DDG-51 class ships and at sites ashore. In support of this objective, the differences course will contain theory, operation, preventive and documented corrective maintenance instruction for the following systems:

TRAINING COURSE CONTROL DOCUMENT

COURSE DATA (Continued)

1. Gun Weapon System (GWS) MK 34 MOD 1
2. Gun Computer System (GCS) MK 160 MOD 8
3. Gun Console (GC) OJ-719(V)/UYQ-70(V)
4. Recorder-Reproducer (RCRP) MK 27 MOD 1
5. Gun Console Computer (GCC) AN/UYK-44(V) Enhanced Processor/Open System Module (EP/OSM) with Expansion Adapter Group (EAG) OF-174(V)
6. Gun Mount Processor (GMP) AN/UYK-44(V) (EP/OSM)
7. Gun Mount Control Panel (GMCP) MK 437 MOD 1
8. Optical Sight System (OSS) MK 46 MOD 1

All preventive maintenance will be taught in accordance with established PMS requirements and guidelines.

All corrective maintenance will be taught and performed in accordance with documented/published procedures.

Course Length Required:

1   19 Calendar Days

Training Sites:

1.   Center for Surface Combat Systems (CSCS) Learning Detachment, Dam Neck, 1912 Regulus Ave. Virginia Beach, VA 23461-2098

Site Unique Training Considerations:

1.

Number of Class Convenings by Training Site:	Required
1. Center for Surface Combat Systems (CSCS) Learning Detachment, Dam Neck	4

Class Capacity by Training Site:	Required
1. Center for Surface Combat Systems (CSCS) Learning Detachment, Dam Neck	
a. Maximum	10
b. Minimum	1

A-4-5

COURSE DATA (Continued)

Planned Average Onboard by Training Site:	Required
1. Center for Surface Combat Systems (CSCS) Learning Detachment, Dam Neck	2.08

Instructor/Support Manning by Site:

BSC	BIN		
71810	0839623	MK 160	FC1

TRAINING COURSE CONTROL DOCUMENT

TRAINEE DATA

Personnel Physical Requirements:

    None

Security Clearance:

    None

Obligated Service:

    0 Months

NOBC/NEC Earned:

    FC-1139

A-4-7

A-113-0125

COURSE LEARNING OBJECTIVES

Upon successful completion of this course, the trainees will have acquired the following knowledge and skills and be able to:

Knowledge:

1. Describe the theory and associated documentation necessary to support and understand the performance of casualty/degraded/abnormal operational tasks and operational tasks requiring advanced analysis, all routine preventive maintenance, and documented fault isolation and repair without going into detailed logic, circuit analysis, individual program flow diagrams, or detailed mechanical component breakdown of the
   a. Gun Weapon System (GWS) MK 34
   b. Gun Computer System (GCS) MK 160
   c. Gun Mount Control Panel (GMCP) MK 437
   d. Optical Sight System (OSS) MK 46
   e. Recorder Reproducer (RCRP) Set MK 27
   f. Gun Console (GC)
   g. Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)

Skills:

1. Perform normal operational procedures with supervision on the
   a. Gun Mount Control Panel (GMCP) MK 437
   b. Gun Console (GC)
   c. Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)

2. Perform all operational procedures with supervision on the
   a. Gun Weapon System (GWS) MK 34
   b. Gun Computer System (GCS) MK 160
   c. Optical Sight System (OSS) MK 46
   d. Recorder Reproducer (RCRP) Set MK 27

3. Perform preventive maintenance procedures with supervision on the
   a. Gun Weapon System (GWS) MK 34
   b. Gun Computer System (GCS) MK 160
   c. Gun Mount Control Panel (GMCP) MK 437
   d. Optical Sight System (OSS) MK 46
   e. Recorder Reproducer (RCRP) Set MK 27
   f. Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)

COURSE LEARNING OBJECTIVES - Continued.

<u>Skills:</u>

4. Perform documented fault isolation and repair procedures to the authorized maintenance level, with supervision, on the
   a. Gun Weapon System (GWS) MK 34
   b. Gun Computer System (GCS) MK 160
   c. Optical Sight System (OSS) MK 46
   d. Recorder Reproducer (RCRP) Set MK 27
   e. Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)

PART S1273/1

GUN WEAPON SYSTEM (GWS) MK 34

A-4-10

Section 1: INTRODUCTION TO THE GUN WEAPON SYSTEM (GWS) MK 34

1. INTRODUCTION TO THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

Topic 1: GENERAL, PHYSICAL, AND DOCUMENTATION DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. State the purpose of the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

2. Describe the modification differences of the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

3. Describe the organization, content, and use of the technical documentation provided for use with the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

     a.   SW221-A1-MMO-010

4. Define the abbreviations, terms, and symbols used with the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

5. State the purpose of the major components of the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

     a.   Gun Computer System (GCS) MK 160
     b.   Optical Sight System (OSS) MK 46
     c.   Gun System MK 45

6. Describe the major components of the Gun Weapon System (GWS) MK 34 including name, nomenclature, physical appearance, reference designators, and location to the detail required to support normal operation.

     a.   Gun Computer System (GCS) MK 160
     b.   Optical Sight System (OSS) MK 46
     c.   Gun System MK 45

7. State the operational characteristics and capabilities of the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

8. Describe the controls, displays, indicators, and alarms of the Gun Weapon System (GWS) MK 34, including location and positions to the detail required to support normal operation.

9. State the security requirements of the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

A-4-12

1. INTRODUCTION TO THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

Topic 2:   FUNCTIONAL AND INTERFACE DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. Describe the physical interface between the Gun Weapon
    System (GWS) MK 34 and related external equipment,
    including name, physical appearance, reference designators,
    and locations of cable routings, junction boxes, switchboard
    connections, and cable terminations to the detail required to
    support normal operation.

2. Describe the functional interface between the Gun Weapon
    System (GWS) MK 34 and related external equipment to the
    detail required to support normal operation.

    a. Electrical
    b. Electronic

3. Describe the functional operation of the Gun Weapon System
    (GWS) MK 34, including the types of signals, signal flow,
    signal/data format, sequential operation, indications, and inputs
    and outputs to the detail required to support normal operation.

4. Describe the function of the controls, displays, indicators, and
    alarms of the Gun Weapon System (GWS) MK 34, including
    positions and colors to the detail required to support normal
    operation.

1. INTRODUCTION TO THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

Topic 3:   OPERATIONAL DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1.   Describe the personnel and equipment safety precautions that
     are to be observed during operation of the Gun Weapon System
     (GWS) MK 34 to the detail required to support normal
     operation.

2.   Describe the authority and regulations pertaining to the
     operation of the Gun Weapon System (GWS) MK 34 to the
     detail required to support normal operation.

3.   Describe the tasks/procedures to be performed when operating
     the Gun Weapon System (GWS) MK 34 to the detail required
     to support normal operation.

     a.   Pre-operational tasks/procedures
     b.   Operational tasks/procedures
     c.   Post-operational tasks/procedures

4.   Describe the recognition and interpretation of the indications
     that should or may occur during the operation of the Gun
     Weapon System (GWS) MK 34, including the displays,
     indicators, alarms, and readouts to the detail required to
     support normal operation.

5.   Describe the function, use, and format of the tapes and disks
     utilized by the Gun Weapon System (GWS) MK 34 to the
     detail required to support normal operation.

A-113-0125

Section 2: BASIC OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34

A-4-15

2. BASIC OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

Topic 1:   BASIC OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1.   Adhere to personnel and equipment safety precautions during
     operation of the Gun Weapon System (GWS) MK 34 in
     accordance with normal operational procedures.

2.   Perform the tasks/procedures for operating the Gun Weapon
     System (GWS) MK 34 in accordance with normal operational
     procedures.

     a.   Pre-operational tasks/procedures
     b.   Operational tasks/procedures
     c.   Post-operational tasks/procedures

3.   Recognize and interpret the indications that occur during
     operation of the Gun Weapon System (GWS) MK 34 in
     accordance with normal operational procedures.

4.   Recognize and interpret the function, use, and format of the
     tapes and disks utilized by the Gun Weapon System (GWS)
     MK 34 in accordance with normal operational procedures.

PART S1273/2

GUN WEAPON SYSTEM (GWS) MK 34

Section 1.   THEORY OF THE GUN WEAPON SYSTEM (GWS) MK 34 (T2)
Section 2.   OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34 (O2)

Section 1: THEORY OF THE GUN WEAPON SYSTEM (GWS) MK 34

1. THEORY OF THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

Topic 1: OPERATIONAL DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. Describe the personnel and equipment safety precautions that are to be observed during maintenance of the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

2. Define the maintenance philosophy for the Gun Weapon System (GWS) MK 34, including the maintenance policy and management plan to the detail required to support preventive and documented corrective maintenance.

    a.   Preventive maintenance
    b.   Corrective maintenance

3. Describe the preventive maintenance procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

4. Describe the operational tests and diagnostic programs contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

5. Describe the recognition and interpretation of malfunction indications of the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

6. Describe the systematic fault isolation procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

7. Describe the disassembly, repair, and reassembly procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

8. Describe the post-repair procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

9. Describe alignment, adjustment, and calibration procedures for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

1. THEORY OF THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

Topic 2:   OPERATIONAL DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1.   Describe the personnel and equipment safety precautions that
      are to be observed during operation of the Gun Weapon System
      (GWS) MK 34 to the detail required to support
      casualty/degraded/abnormal/not-full-mission capable modes of
      operation.

2.   Describe the Gun Weapon System (GWS) MK 34 casualty,
      degraded, and abnormal mode/s of operation to the detail
      required to support casualty/degraded/abnormal/not-full-
      mission capable modes of operation.

A-113-0125

Section 2: OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34

A-4-21

2. OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

Topic 1:   BASIC OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. Adhere to personnel and equipment safety precautions during
    operation of the Gun Weapon System (GWS) MK 34 in
    accordance with casualty/degraded/abnormal/not-full-mission
    operational procedures.

2. Perform the Gun Weapon System (GWS) MK 34 casualty,
    degraded, and abnormal mode/s of operation in accordance
    with casualty/degraded/abnormal/not-full-mission operational
    procedures.

PART S1273/3

GUN WEAPON SYSTEM (GWS) MK 34

Section 1.   PREVENTIVE MAINTENANCE OF THE GUN WEAPON SYSTEM (GWS) MK 34 (P1)

A-4-23

Section 1: PREVENTIVE MAINTENANCE OF THE GUN WEAPON SYSTEM (GWS) MK 34

1. PREVENTIVE MAINTENANCE OF THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

Topic 1:   PREVENTIVE MAINTENANCE OF THE GUN WEAPON SYSTEM (GWS) MK 34

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1.   Adhere to personnel and equipment safety precautions during maintenance of the Gun Weapon System (GWS) MK 34 in accordance with preventive maintenance procedures.

2.   Perform the preventive maintenance procedures for the Gun Weapon System (GWS) MK 34 as scheduled by the Planned Maintenance System (PMS) in accordance with preventive maintenance procedures.

PART S1273/4

GUN WEAPON SYSTEM (GWS) MK 34

Section 1. PREVENTIVE AND BASIC CORRECTIVE MAINTENANCE OF THE GUN WEAPON SYSTEM
(GWS) MK 34 (C1)

Section 1: PREVENTIVE AND BASIC CORRECTIVE MAINTENANCE OF THE GUN WEAPON SYSTEM (GWS) MK 34

<table>
<tr><td>Topic No.</td><td>Topic Title</td><td>Page</td></tr>
<tr><td>1</td><td>Basic Corrective Maintenance of Gun Weapon System (GWS) MK 34</td><td>S1273/4-1-1-1</td></tr>
</table>

1. PREVENTIVE AND BASIC CORRECTIVE MAINTENANCE OF THE GUN WEAPON SYSTEM (GWS) MK 34

Topic 1: BASIC CORRECTIVE MAINTENANCE OF GUN WEAPON SYSTEM (GWS) MK 34

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. Adhere to personnel and equipment safety precautions during maintenance of the Gun Weapon System (GWS) MK 34 in accordance with documented corrective maintenance procedures.

2. Perform the operational tests and diagnostic programs for the Gun Weapon System (GWS) MK 34 in accordance with documented corrective maintenance procedures.

3. Recognize and interpret the malfunction indications of the Gun Weapon System (GWS) MK 34 in accordance with documented corrective maintenance procedures.

4. Perform the systematic fault isolation procedures for the Gun Weapon System (GWS) MK 34 in accordance with documented corrective maintenance procedures.

5. Perform the procedures to disassemble, repair and reassemble the Gun Weapon System (GWS) MK 34 to the authorized maintenance level in accordance with documented corrective maintenance procedures.

6. Perform the post-repair procedures for the Gun Weapon System (GWS) MK 34 in accordance with documented corrective maintenance procedures.

7. Perform alignment, adjustment, and calibration procedures for the Gun Weapon System (GWS) MK 34 in accordance with documented corrective maintenance procedures.

PROFILE ITEM-TO-TOPIC OBJECTIVE ASSIGNMENT CHART

Table	Item	TOS	Vol	Part	Sect	Topic	TLO	Test Item No.	Table	Item	TOS	Vol	Part	Sect	Topic	TLO	Test Item No.
S1273	1-1-1	T1		S1273/1	1	1	1		S1273	1-6-2	T2		S1273/2	1	1	3	
S1273	1-1-2	T1		S1273/1	1	1	5		S1273	1-6-3	T2		S1273/2	1	1	4	
S1273	1-1-2-a	T1		S1273/1	1	1	5		S1273	1-6-4	T2		S1273/2	1	1	5	
S1273	1-1-2-b	T1		S1273/1	1	1	5		S1273	1-6-5	T2		S1273/2	1	1	6	
S1273	1-1-2-c	T1		S1273/1	1	1	5		S1273	1-6-6	T2		S1273/2	1	1	7	
S1273	1-1-3	T1		S1273/1	1	1	4		S1273	1-6-7	T2		S1273/2	1	1	8	
S1273	1-1-4	T1		S1273/1	1	1	7		S1273	1-6-8	T2		S1273/2	1	1	9	
S1273	1-1-5	T1		S1273/1	1	1	2		S1273	1-6-9	T2		S1273/2	1	1	1	
S1273	1-1-6	T1		S1273/1	1	1	9		S1273	1-7-1	T1		S1273/1	1	1	3	
S1273	1-2-1	T1		S1273/1	1	1	6		S1273	1-7-1-a	T1		S1273/1	1	1	3	
S1273	1-2-2	T1		S1273/1	1	1	8		S1273	1-7-1-b	T1		S1273/1	1	1	3	
S1273	1-3-1	T1		S1273/1	1	2	3		S1273	1-7-1-c	T1		S1273/1	1	1	3	
S1273	1-3-2	T1		S1273/1	1	2	4		S1273	1-7-1-d	T1		S1273/1	1	1	3	
S1273	1-4-1	T1		S1273/1	1	2	1		S1273	2-1-1	O1		S1273/1	2	1	2	
S1273	1-4-2	T1		S1273/1	1	2	2		S1273	2-1-1-a	O1		S1273/1	2	1	2	
S1273	1-4-2-a	T1		S1273/1	1	2	2		S1273	2-1-1-b	O1		S1273/1	2	1	2	
S1273	1-4-2-b	T1		S1273/1	1	2	2		S1273	2-1-1-c	O1		S1273/1	2	1	2	
S1273	1-5-1	T1		S1273/1	1	3	2		S1273	2-1-2	O1		S1273/1	2	1	3	
S1273	1-5-2	T1		S1273/1	1	3	3		S1273	2-1-3	O2		S1273/2	2	1	2	
S1273	1-5-2-a	T1		S1273/1	1	3	3		S1273	2-1-4	O1		S1273/1	2	1	4	
S1273	1-5-2-b	T1		S1273/1	1	3	3		S1273	2-1-5	O1		S1273/1	2	1	1	
S1273	1-5-2-c	T1		S1273/1	1	3	3		S1273	2-1-5	O2		S1273/2	2	1	1	
S1273	1-5-3	T1		S1273/1	1	3	4		S1273	2-2-1	P1		S1273/3	1	1	2	
S1273	1-5-4	T2		S1273/2	1	2	2		S1273	2-2-2	C1		S1273/4	1	1	2	
S1273	1-5-5	T1		S1273/1	1	3	5		S1273	2-2-3	C1		S1273/4	1	1	3	
S1273	1-5-6	T1		S1273/1	1	3	1		S1273	2-2-4	C1		S1273/4	1	1	4	
S1273	1-5-6	T2		S1273/2	1	2	1		S1273	2-2-5	C1		S1273/4	1	1	5	
S1273	1-6-1	T2		S1273/2	1	1	2		S1273	2-2-6	C1		S1273/4	1	1	6	
S1273	1-6-1-a	T2		S1273/2	1	1	2		S1273	2-2-7	C1		S1273/4	1	1	7	
S1273	1-6-1-b	T2		S1273/2	1	1	2		S1273	2-2-8	P1		S1273/3	1	1	1	

TRAINING COURSE CONTROL DOCUMENT

A-113-0125

RESOURCE REQUIREMENTS LIST

COURSE: Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1
Differences Course

SITE NAME: Center for Surface Combat Systems (CSCS) Learning Detachment, Dam Neck

CLASS SIZE: 10

A.   Texts

Doc. No.	Title	Per Tr.	Per Inst.	Per Cl.
A-113-0125	Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course Lesson Plan. Prepared by PEO IWS3C.		1	
A-113-0125	Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course Trainee Guide. Prepared by PEO IWS3C.	1	1	

B.   References

Doc. No.	Title	Per Tr.	Per Inst.	Per Cl.
MIP 4801/006 OPNAVINST 4790 (Series)	Preventive Maintenance Requirements for Gun Weapon System (GWS) MK 34 MOD 0 & 1	1	1	1
MIP 4813/007 OPNAVINST 4790 (Series)	Preventive Maintenance for Optical Sight System (OSS) MK 46 MOD 0 & 1	1	1	1
MIP 4813/008 OPNAVINST 4790 (Series)	Preventive Maintenance for Gun Computer System (GCS) MK 160 (MOD)	1	1	1
OPNAVINST 5510.10 (Series)	Information and Personnel Security Program Regulation	1	1	1

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NAVEDTRA 131B VOL II

TRAINING COURSE CONTROL DOCUMENT

RESOURCE REQUIREMENTS LIST - Continued.

Doc. No.	Title	Per Tr.	Per Inst.	Per Cl.
SE610-PV-MMO-010	Organizational Level Maintenance for Data Processing Set (DPS) AN/UYK-44(V)	1	1	1
SE610-PV-SUP-030	Technical Manual Supplement for Data Processing Set (DPS) AN/UYK-44(V)	1	1	1
SE685-CA-MMO-05A	Maintenance Manual for Command and Decision Console OJ-719(V)9/AN/UYQ-70(V)	1	1	1
SE686-CA-MMO-050	Maintenance Manual for Command and Decision Console OJ-719(V)/UYQ-70(V)	1	1	1
SE686-CL-MMO-030	Technical Manual for Command and Decision Console OJ-719(V)11/UYQ-70	1	1	1
SW210-A1-MMO-010	Technical Manual Optical Sight System MK 46 MOD 1	1	1	1
SW210-A1-MMO-020	Technical Manual Optical Sight System MK 46 MOD 1	1	1	1
SW221-A1-MMO-010	Maintenance Manual for Gun Weapon System MK 34 MOD 1	1	1	1
SW224-A8-MMO-010	Maintenance Manual for Gun Computer System MK 160 MOD 8	1	1	1
SW224-AA-MMO-A10	Technical Manual for Recorder Reproducer MK 27 MOD 1	1	1	1

C.   Equipment

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	Above Deck Sensor Unit MK 85 MOD 1 (p/o OSS MK 46 MOD 1)	006040518			SW210-A1-MMO-010/020			1

RESOURCE REQUIREMENTS LIST - Continued.

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
2.	Command and Decision Console OJ-719(V)/UYQ-70(V) (p/o GCS MK 160 MOD 8)	7244436	$275,000.00		SE686-CA-MMO-050			1
3.	Control and Display Console (CDC) MK 132 MOD 2 (p/o OSS MK 46 MOD 1)	006040525			SW210-A1-MMO-010/020			1
4.	Gun Computer System (GCS) MK 160 MOD 8	No Number			SW224-A8-MMO-010			1
5.	Gun Console Computer (GCC) AN/UYK-44(V) (EP/OSM) with Expansion Adapter Group (EAG) OF-174(V) (p/o GCS MK 160 MOD 8)	7221614-01	$495,000.00		SW224-A8-MMO-010, SE610-PV-MMO-010, SE610-PV-SUP-030			1
6.	Gun Mount Control Panel (GMCP) MK 437 MOD 1	7244531	$70,000.00		SW224-A8-MMO-010			1
7.	Gun Mount Processor (GMP) AN/UYK-44(V) (EP/OSM) (P/o GCS MK 160 MOD 8	7221614-01	$335,000.00		SW224-A8-MMO-010			1
8.	Optical Sight System (OSS) MK 46 MOD 1	0-006040005	$1,700,000.00		SW210-A1-MMO-010/020			1

RESOURCE REQUIREMENTS LIST - Continued.

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
9.	Power Supply (PS) MK 177 MOD 1 (p/o OSS MK 46 MOD 1)	006040535			SW210-A1-MMO-010/020			1
10.	Recorder Reproducer (RCRP) MK 27 MOD 1 (p/o GCS MK 160 MOD 8)	7244867-1	$120,000.00		SW224-AA-MMO-010			1
11.	Safety Switch S1 (p/o OSS MK 46 MOD 1)	071449			SW210-A1-MMO-010/020			1
12.	Stabilization and Electronics Unit (SEU) MK 104 MOD 1 (p/o OSS M K46 MOD 1)	00604A666			SW210-A1-MMO-010/020			1

D.   Films/Videotapes/Videodiscs

Designator	Title	Running Time	Per Cl.
None			

E.   Graphics

1.   Transparencies

Title	Per Cl.	Source	Figure No.
None			

2.   Slides.

Title	Per Cl.	Source	Figure No.
None			

RESOURCE REQUIREMENTS LIST - Continued.

3.   Wall Charts.

Wall Chart No.	Title		Per Cl.	Source		Figure No.
None						

F.   Hand Tools

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	General Purpose Hand Tools	N/A	$150.00		N/A	1	1	1

G.   Prefaulted Modules

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	S1277 #1 (GMCP) Failed Power Supply, Gun Mount Control Panel (GMCP) MK 437 MOD 1	20010006-015			SW224-A8-MMO-010	1	1	1
2.	S1277 #2 (GMCP) Failed Velocimeter Faile-Safe CCA	7625460	$2,000.00		SW224-A8-MMO-010	1	1	1
3.	S1277 #3 (GMCP) Failed Indicating Fuze Holder	FHL32W-11	$80.00		SW224-A8-MMO-010	1	1	1
4.	S2789 #1 (OSS) Failed OSS CPU 2A1A3A1A9	6937022	$3,000.00		SW210-A1-MMO-010	1	1	1
5.	S2789 #2 (OSS) Failed Relay Driver CCA 3A1	6939846	$9,000.00		SW210-A1-MMO-010	1	1	1

RESOURCE REQUIREMENTS LIST - Continued.

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
6.	S2789 #3 (OSS) Failed Encoder CCA 2A1A3A1A15	6936847	$5,000.00		SW210-A1-MMO-010	1	1	1
7.	S2789 #4 (OSS) Disable F/O Transmitter 4A2, 3, 4, or 5 Fault Insertion Technique	N/A			SW210-A1-MMO-010	1	1	1
8.	S2789 #5 (OSS) Disable Safety Switch Connector S1J1 Fault Insertion Technique	N/A			SW210-A1-MMO-010	1	1	1
9.	S2789 #6 (OSS) Fuze Failure for PS MK 177 MOD 1 Test Panel Fault Insertion Technique	N/A			SW210-A1-MMO-010	1	1	1
10.	S2805 #1 (GCC) Failed Fiber Distributed Data Interface CCA	5211-DAS-ST-1M			SW224-A8-MMO-010	1	1	1
11.	S2805 #2 (GMP) Failed VME-IOC CCA Fault Insertion Technique	N/A	$0.00		SW224-A8-MMO-010	1	1	1
12.	S2805 #3 (GCC) Failed Clock Re-Driver CCA	7365072			SW224-A8-MMO-010	1	1	1

RESOURCE REQUIREMENTS LIST - Continued.

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
13.	S2805 #4 (GMP) Failed SCRAMNet CCA	H-AS-D6VME 04M-02			SW224-A8-MMO-010	1	1	1
14.	S2805 #5 (GCC) Failed Motorola 2600 Single Board Computer (SBC) CCA	7244868-02			SW224-A8-MMO-010	1	1	1
15.	S2805 #6 (GMP) Failed Enhanced Processor (EP)/VME CCA	7372452-17			SW224-A8-MMO-010	1	1	1
16.	S3399 #1 (Gun Console) Disabled SCSI Cable Interface Fault Insertion Technique	N/A			SE686-CA-MMO-050, SE686-CL-MMO-030	1	1	1
17.	S3399 #2 (Gun Console) Disable CB1 Fault Insertion Technique	N/A			SE686-CA-MMO-050, SE686-CL-MMO-030	1	1	1
18.	S3706 #1 (RCRP) Failed Isolation Transformer to DCC Power Cable		$20.00		SW224-AA-MMO-010	1	1	1
19.	S3706 #2 (RCRP) Failed Data Storage Set (DSS) Power Supply	709SZ005-02	$2,300.00		SW224-AA-MMO-010	1	1	1

RESOURCE REQUIREMENTS LIST - Continued.

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
20.	S3706 #3 (RCRP) Failed Ethernet Tee Connector	BN23	$4.00		SW224-AA-MMO-010	1	1	1

H.   Software

No.	Title	Number	Version	Vendor	Type	Cost	Reference	Per Tr.	Per Inst.	Per Cl.
1.	Gun Computer System (GCS) MK 160 MOD 8 Operational Program	PGM 0819				$330.00	SW224-A8-MMO-010	1	1	1
2.	Gun Computer System MK 160 MOD 8 VxWorks Operating System	PGM 0807				$330.00	SW224-A8-MMO-010	1	1	1
3.	Gun Computer System Training Facility (GCSTF) Operational Program	PGM 0824				$330.00		1	1	1
4.	Gun Mount Interface Tester (GMIT) Operational Program	PGM 0823				$330.00		1	1	1
5.	Naval Surface Fire Support Embedded Trainer (NSFSET) Operational Program	PGM 0854				$330.00	SW224-A8-GYD-060	1	1	1
6.	Optical Sight System (OSS) MK 46 MOD 1 Operational Program	PGM 0834				$1,000.00	SW210-A1-MMO-010	1	1	1

RESOURCE REQUIREMENTS LIST - Continued.

No.	Title	Number	Version	Vendor	Type	Cost	Reference	Per Tr.	Per Inst.	Per Cl.
7.	Optical Sight System (OSS) MK 46 MOD 1 VxWorks Operating System	PGM 0807				$500.00	Resident on Motorola 2604 variants of the 2A1A3A1A9 Central Processor CCA. Being phased out.	1	1	1
8.	Optical Sight System (OSS) MK 46 MOD 1 VxWorks Operating System	PGM 0838				$500.00	Resident on Motorola 270X-Series 2A1A3A1A9 Central Processor CCAs. Phase in beginning with DDG 90.	1	1	1
9.	Optical Sight System MK 46 MOD 1 X-Windows Display Manager	PGM 0840				$500.00	SW210-A1-MMO-010	1	1	1
10.	Recorder Reproducer Set (RCRP) MK 27 MOD 1 Operational Program	PGM 0829				$330.00	SW224-AA-MMO-010	1	1	1

RESOURCE REQUIREMENTS LIST - Continued.

I. Support Equipment

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	AEGIS Display System (ADS) Emulator (Briggs Box)	N/A	$72,000.00		None	1	1	1
2.	Gun Computer System Training Facility (GCSTF) Computer Monitor	N/A	$2,000.00		None	1	1	1
3.	Gun Computer System Training Facility (GCSTF) Equipment Rack	N/A	$2,000.00		None	1	1	1
4.	Gun Computer System Training Facility (GCSTF) keyboard	N/A	$150.00		N/A	1	1	1
5.	Gun Computer System Training Facility AN/UYK-44 (V) EP/OSM	7221614-01	$335,000.00		SE610-PV-MMO-010, SE610-PV-SUP-030	1	1	1
6.	Gun Mount Interface Tester (GMIT) Desktop Computer	N/A	$10,000.00		N/A	1	1	1
7.	Vacuum Cleaner, General Purpose	N/A	$100.00		None	1	1	1

RESOURCE REQUIREMENTS LIST - Continued.

J.   Test Equipment

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	Multimeter, Electronic, Digital, Fluke Corporation		$240.00		N/A	1	1	1

K.   Trainer Materials

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	Lesson Plan, Instructor, Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 DIfferences Course		$22.00		N/A	1	1	1
2.	Trainee Guide, Student, Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course	N/A	$3.00		N/A	1	1	1

L.   Support Materials

Instruction Sheets. All instruction sheets (i.e., Assignment Sheets, Job Sheets, etc.) are A-113-0125 series.

Identification No.	Instruction Sheet Type	Title	Per Tr.	Per Inst.	Per Cl.
	(All instruction sheets for this course are contained within Trainee Guide A-113-0125.)				

COURSE MASTER SCHEDULE

A-113-0125
Length of period : 50 minutes

WEEK 1
DAY 1

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1273/1-1-1	Class	1	General, Physical, and Documentation Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-2	Class	2	Functional and Interface Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-2	Class	3	Functional and Interface Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-2	Class	4	Functional and Interface Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-2	Class	5	Functional and Interface Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-3	Class	6	Operational Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-3	Class	7	Operational Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-3	Class	8	Operational Description of the Gun Weapon System (GWS) MK 34	10:1	

DAY 2

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1273/1-2-1	Lab	9	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(2/1)
S1273/1-2-1	Lab	10	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(2/1)
S1273/1-2-1	Lab	11	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(2/1)

COURSE MASTER SCHEDULE (Continued)

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1273/1-2-1	Lab	12	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(2/1)
S1273/1-2-1	Lab	13	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(2/1)
S1274/1-1-1	Class	14	General, Physical, and Documentation Description of Gun Computer System (GCS) MK 160	10:1	
S1274/1-1-1	Class	15	General, Physical, and Documentation Description of Gun Computer System (GCS) MK 160	10:1	
S1274/1-1-2	Class	16	Functional and Interface Description of Gun Computer System (GCS) MK 160	10:1	

DAY 3					
Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1274/1-1-2	Class	17	Functional and Interface Description of Gun Computer System (GCS) MK 160	10:1	
S4291-1-1	Class	18	General, Physical, and Documentation Description of the Gun Console (GC)	10:1	
S4291-1-2	Class	19	Functional and Interface Description of the Gun Console (GC)	10:1	
S4291-1-3	Class	20	Operational Description of the Gun Console (GC)	10:1	
S4291-2-1	Class	21	Operational Description of the Gun Console (GC)	10:1	
S4291-3-1	Lab	22	Basic Operation and Casualty Operation of the Gun Console (GC)	10:1	(5/1)
S4291-3-1	Lab	23	Basic Operation and Casualty Operation of the Gun Console (GC)	10:1	(5/1)
S3706/1-1-1	Class	24	General, Physical and Documentation Description of the Recorder Reproducer (RCRP) Set MK 27	10:1	

DAY 4					
Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S3706/1-1-2	Class	25	Functional and Interface Description of the Recorder Reproducer (RCRP) Set MK 27	10:1	

COURSE MASTER SCHEDULE (Continued)

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S3706/1-1-3	Class	26	Operational Description of the Recorder Reproducer (RCRP) Set MK 27	10:1	
S3706/1-2-1	Lab	27	Operation of the Recorder Reproducer (RCRP) Set MK 27	10:1	(5/1)
S3706/1-2-1	Lab	28	Operation of the Recorder Reproducer (RCRP) Set MK 27	10:1	(5/1)
S3706/1-3-1	Class	29	Operational Description of the Recorder Reproducer (RCRP) Set MK 27	10:1	
S4292/1-1-1	Class	30	General, Physical and Documentation Description of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	
S4292/1-1-2	Class	31	Functional and Interface Description of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	
S4292/1-1-3	Class	32	Operational Description of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	

DAY 5

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S4292/1-2-1	Lab	33	Basic Operation of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	(5/1)
S4292/1-2-1	Lab	34	Basic Operation of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	(5/1)
S1277/1-1-1	Class	35	General, Physical, and Documentation Description of the Gun Mount Control Panel (GMCP) MK 437	10:1	
S1277/1-1-2	Class	36	Functional and Interface Description of the Gun Mount Control Panel (GMCP) MK 437	10:1	
S1273/2-1-1	Class	37	Operational Description of the Gun Weapon System (GWS) MK 34	10:1	

COURSE MASTER SCHEDULE (Continued)

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1273/2-1-2	Class	38	Operational Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/2-2-1	Lab	39	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(5/1)
S1273/2-2-1	Lab	40	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(5/1)

WEEK 2
DAY 1

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1273/2-2-1	Lab	41	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(5/1)
S1273/2-2-1	Lab	42	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(5/1)
S1273/3-1-1	Lab	43	Preventive Maintenance of the Gun Weapon System (GWS) MK 34	10:1	(5/1)
S1273/3-1-1	Lab	44	Preventive Maintenance of the Gun Weapon System (GWS) MK 34	10:1	(5/1)
S1274/2-1-1	Class	45	Operational Description of Gun Computer System (GCS) MK 160	10:1	
S1274/2-2-1	Lab	46	Operation of Gun Computer System (GCS) MK 160	10:1	(2/1)
S1274/2-2-1	Lab	47	Operation of Gun Computer System (GCS) MK 160	10:1	(2/1)
S1274/2-2-1	Lab	48	Operation of Gun Computer System (GCS) MK 160	10:1	(2/1)

FAULT APPLICABILITY LIST

PART	SECT	TOS	EQUIPMENT	FUNCTION FAULTED	FAULT NO.	DOCUMENT

Note 1: The PART and SECT columns indicate the most appropriate location within the curriculum to use the fault.

Note 2: The asterisk in the Fault No. column indicates that fault is required for use in the curriculum.

Note 3: Faults approved for dual use are noted in the TOS column.

TAB A-5

LESSON PLAN

Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course

LESSON PLAN

April 2006

PUBLISHED BY Commander, Center for Surface Combat Systems (CSCS) Dahlgren

A-113-0125

LIST OF EFFECTIVE ELEMENTS

Element No.	Change In Effect	Element No.	Change In Effect	Element No.	Change In Effect
Title Page	Original	Tab Part S1273/1	Original	S1273/1-2-1-1 through S1273/1-2-1-7	Original
List of Effective Elements	Original	S1273/1-1	Original		
Letter of Promulgation	Original	S1273/1-1-1	Original	Tab Part S1274/1	Original
		S1273/1-1-1-1 through S1273/1-1-1-11	Original	S1274/1-1	Original
Change Record	Original			S1274/1-1-1	Original
Table of Contents	Original	S1273/1-1-2	Original	S1274/1-1-1-1 through S1274/1-1-1-11	Original
Security Awareness Notice	Original	S1273/1-1-2-1 through S1273/1-1-2-6	Original		
Safety/Hazard Awareness Notice	Original	S1273/1-1-3	Original	S1274/1-1-2	Original
How to Use the Lesson Plan	Original	S1273/1-1-3-1 through S1273/1-1-3-7	Original	S1274/1-1-2-1 through S1274/1-1-2-6	Original
Allocation of Instructional Time	Original	S1273/1-2	Original	Tab Part S4291	Original
				S4291-1	Original
CMS	Original	S1273/1-2-1	Original	S4291-1-1	Original
CLOs	Original				

LIST OF EFFECTIVE ELEMENTS - Continued.

Element No.	Change In Effect	Element No.	Change In Effect	Element No.	Change In Effect
S4292/1-1-2-1 through S4292/1-1-2-6	Original	S1277/1-1-2	Original	S1273/2-2-1-1 through S1273/2-2-1-5	Original
S4292/1-1-3	Original	S1277/1-1-2-1 through S1277/1-1-2-6	Original	Tab Part S1273/3	Original
S4292/1-1-3-1 through S4292/1-1-3-7	Original	Tab Part S1273/2	Original	S1273/3-1	Original
S4292/1-2	Original	S1273/2-1	Original	S1273/3-1-1	Original
S4292/1-2-1	Original	S1273/2-1-1	Original	S1273/3-1-1-1 through S1273/3-1-1-5	Original
S4292/1-2-1-1 through S4292/1-2-1-6	Original	S1273/2-1-1-1 through S1273/2-1-1-11	Original	Tab Part S1274/2	Original
Tab Part S1277/1	Original	S1273/2-1-2	Original	S1274/2-1	Original
S1277/1-1	Original	S1273/2-1-2-1 through S1273/2-1-2-4	Original	S1274/2-1-1	Original
S1277/1-1-1	Original	S1273/2-2	Original	S1274/2-1-1-1 through S1274/2-1-1-7	Original
S1277/1-1-1-1 through S1277/1-1-1-10	Original	S1273/2-2-1	Original	S1274/2-2	Original
				S1274/2-2-1	Original

LESSON PLAN

LETTER OF PROMULGATION

Letter of Promulgation

LESSON PLAN

CHANGE RECORD

Number and Description of Change	Entered By	Date

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REFERENCE MATERIAL

LESSON PLAN

SECURITY AWARENESS NOTICE

None

LESSON PLAN

SAFETY/HAZARD AWARENESS NOTICE

All personnel involved in operation or maintenance of electronic equipment must be thoroughly familiar with the electronic equipment safety precautions contained in Electronic Installation and Maintenance Book, General, NAVSEA SE000-00-EIM-100, Section 3, and Naval Ships' Technical Manual, Chapter 300, S9086-KC-STM-010/CH-300, Section 2. In addition, attention is directed to the Navy Safety Program Instructions, OPNAVINST 5100.19 (series) and 5100.23 (series), and the safety training requirements contained in CNETINST 1500.20 (series).

This equipment employs voltages which are dangerous and may be fatal if contacted by operating or maintenance personnel. There are mechanical safety devices associated with this equipment that must be maintained in a constant state of readiness to preclude causing injury to personnel and/or damage to equipment. Extreme caution must be exercised when working with or handling this equipment. Some components are extremely heavy. Rigid pre-inspections must be made to handling equipment to ensure their safety and safety summaries must be read to the handling teams prior to conducting dangerous evolutions. Hazard awareness dictates that this equipment must always be viewed as an integral part of a system and not as a component. While every practical precaution has been incorporated into this equipment, it is not possible or practical to try to list every condition or hazard that you may encounter. Therefore, all operating or maintenance personnel must at all times observe as a minimum, the following:

DON'T SERVICE OR ADJUST ALONE

Under no circumstances will a person operate or maintain equipment without the immediate presence or assistance of another person capable of rendering aid. Unless under direct supervision of a qualified person, no person shall operate or maintain equipment for which he is unqualified.

DON'T TAMPER WITH INTERLOCKS

Reliance on interlock circuits to remove power from the equipment is never to be assumed. Until operation of the interlock is verified, equipment is assumed to be in the hazardous mode of operation. Under no circumstances will any access gate, door, or interlock switch be removed, bypassed, or modified in any way by other than authorized maintenance personnel and then only after observing proper tag-out procedures.

SAFETY/HAZARD AWARENESS NOTICE - Continued.

REPORT ALL HAZARDS

If at any time you detect a hazard, it is your responsibility to report the hazard to ensure that it is corrected. If at any time you detect a "new" or "suspected new" hazard, particularly due to equipment installation, modification, or repair, it is your responsibility to ensure that a SAFETYGRAM is submitted to the Naval Safety Center, Norfolk, VA, in accordance with OPNAVINST 5102.1 (series). This will ensure that this hazard will be investigated, publicized, or corrected, as required.

Additionally, SSPINST 3100.1 (series) requires SWS personnel to submit special check TFRs when a potential or actual unsafe condition is noticed that could cause injury to personnel and/or damage to equipment. When a problem/failure occurs involving the safety of personnel or equipment and it cannot be immediately resolved by command/technical assistance on-site, the TFR data shall be transmitted to SSP and others by Naval Message.

SAFETY - "TRAINING TIME OUT"

In any training situation when a student or instructor expresses concern for personal safety, it is an indication that a need for clarification of procedures or requirements exists and a "Training Time Out" shall be called. An individual should verbally call "TRAINING TIME OUT" (TTO) if they detect a hazardous condition during any teaching session (lab or theory), or raise a clenched fist to indicate a "TRAINING TIME OUT" (TTO) if the verbal command cannot be heard. Training activities will be suspended until the hazardous situation has been examined and additional explanation and instruction has been provided to allow safe resumption of training. Caution should be used to ensure a halt to a procedure does not result in additional hazards. TTO follow-up procedures will be performed in accordance with CNET Instruction 1500.20(Series).

HOW TO USE THE LESSON PLAN

COMPOSITION OF THE LESSON PLAN

This Lesson Plan provides an instructor with the information required to prepare for, and instruct in, the topics assigned. As an introduction to each topic, the instructor shall display his/her name and the topic title on the chalkboard. The instructor will also inform the trainees of the Topic Learning Objectives, establish classroom procedures (questioning, note taking, breaks, etc.), and motivate the trainee by emphasizing the importance of the topic. At the end of each day of instruction, the instructor will assign the trainees all materials required in preparation for the following day. Each topic within this Lesson Plan contains the following:

1. Topic Learning Objectives. These objectives are written to reflect the training level(s) of Personnel Performance Profiles (PPPs) that the topic supports. The objectives are derived by applying elements of the Training Objective Statements (TOS) to the elements of the PPPs.

2. Trainee Preparation. This portion assigns the study and review material that the trainee must complete to prepare for this topic. It contains detailed assignments in reference publications, diagrams, and support materials, and is assigned at the end of each day of instruction. The instructor must review the Trainee Preparation portion of the topics planned for the following day and make study assignments accordingly.

3. Instructor Preparation. This part of the topic page contains:

    a. A reminder to review assigned trainee material,

    b. A list of all reference materials required by the instructor to prepare for instructing a topic.

    c. A list of all trainee materials required for the topic including reference, equipment, support materials, and test equipment.

4. Discussion-Demonstration-Activities. This page is divided into two columns, as follows:

    a. Discussion Point. This column outlines the subject matter to the depth necessary to support the training level(s) of the corresponding topic learning objective. Also, sufficient space is provided for instructor personalization.

HOW TO USE THE LESSON PLAN - Continued.

b. Related Instructor Activity. This column lists specific instructor activities, excluding oral discussion, which will aid in trainee learning. This Related Instructor Activity column provides the instructor specific instructions relative to reference documents, instructional media material, and guidance regarding trainee behavior during presentation of instruction. These activities carry the same number as the discussion points to which they are related. As with the discussion points, space is left for the instructor to add personalizing notes. The phrase "Reference ..." is used to help the instructor locate information applicable to a particular discussion point and direct the instructor to use that reference material in the classroom. The term "Refer to ..." provides direction for the instructor when the reference material is actually intended for use in the classroom. If there is no related instructor activity for a discussion point, the space is left blank and the number omitted.

FUNCTION OF THE LESSON PLAN

The Lesson Plan expands the approved Curriculum Outline of Instruction into a content format that will serve as an effective plan for instruction. It provides room for instructors to add individual notes. The form of the lesson plan facilitates preparation, minimizes deviation from the approved plan for the topic, and lessens the need for rewriting material already contained in the outline. As the instructors prepare to teach the topic for the first time, they may write in the technical data, information, or notes to be used to do a professional job of instruction. As instructors gain experience teaching a topic, they may modify and improve the data written in.

All theory discussions must relate to practical work. The design theory of an equipment may be interesting to the instructor, but the trainee must learn how to keep the equipment in proper operating condition. The trainee must bypass all unnecessary knowledge and concentrate on learning to perform the necessary maintenance techniques required by these equipments. Any activity that does not contribute directly to training in the operation and maintenance of these equipments is wasted effort, regardless of how interesting it may seem to be. A thorough understanding of the equipment theory is necessary in order that the practical work on the equipment may be accomplished. The reason for the theory is to assist the trainee in doing practical work.

A Lesson Plan without the instructor's personalization is maintained in the appropriate school offices and has several administrative functions. The Officer-in-Charge and the course supervisors will use it as a guide in determining the kind and depth of the material taught, and as a reference in monitoring the effectiveness of instruction. Each instructor will use it as a reference to determine what the trainees have learned prior to, and will learn subsequent to the topic, so that the instructor can gauge the level and direction of instruction. When approved by the Chief of Naval Education and Training, this Lesson Plan becomes the master plan for instruction.

LESSON PLAN

HOW TO USE THE LESSON PLAN - Continued.

USE OF THE LESSON PLAN

When issued to an instructor, this lesson plan becomes his/her personal property, subject only to the regulations that govern classified matter. Each instructor will make handwritten entries in the spaces provided. Personalized topics may be passed on to a relieving instructor. However, they are to be used only for reference purposes in developing a personalized Lesson Plan.

Changes to this plan are made by direction of the Chief of Naval Education and Training through recommendations by the school and from the results of the training evaluation program. All changes shall ensure effective trainee comprehension and fulfillment of topic learning objectives.

STUDY ASSIGNMENTS

Study assignments are provided in the Lesson Plan. One of the objectives of the training is learning to intelligently use the technical manuals associated with the equipments. Training effectiveness depends on conscientious and consistent use of the assignments and schematics in the pertinent technical manuals. All completed assignments should be reviewed with the trainee at the first opportunity.

EQUIPMENT FAULTS

The Fault Applicability List in the Lesson Plan lists the faults/fault insertion devices required in this course. When desirable, additional faults may be selected from the Fault Applicability List.

INSTRUCTION SHEETS, EXAMINATIONS, QUIZZES

Instruction Sheets, consisting of Information Sheets, Job Sheets, Assignment Sheets, Problem Sheets, and Diagram Sheets are an integral part of the course and aid trainees in achieving the topic learning objectives. It is necessary to see that these activities are accurately completed.

Answers to questions on the sheets are provided on the Answer Sheet at the back of each Lesson Plan. Students should be instructed to write only on Trainee Name Page, Job Sheets, Diagram Sheets, and Problem Sheets. New Trainee Name Pages, Job Sheets, Diagram Sheets, and Problem Sheets will be reproduced and inserted so the Trainee Guide and Instruction Sheets may be used in the next course.

HOW TO USE THE LESSON PLAN - Continued.

Quizzes and examinations are administered to monitor trainee comprehension at the completion of significant areas of instruction.

DIVISION OF COURSE MATERIALS INTO FUNCTIONAL PARTS

The course material in the Lesson Plan has been divided into parts to support PPP tables as assigned by the corresponding Table Assignment Charts. It has been further divided into sections to support instruction on theory, operation, preventive maintenance, and corrective maintenance. The sequence of instruction is based on an analysis of the tasks for trainee performance and on the requirements for prerequisite knowledge or skills required for instruction on the more complex equipments.

TRAINING MATERIAL SUPPORT PROGRAM

The Training Material Support Program has been established for the purpose of improving the curriculum and other training materials. It is each instructor's responsibility to become familiar with this program as outlined in the applicable management documentation. You are to submit all your suggestions for improvement through a Change Recommendation as outlined in the applicable management documentation. These suggestions should include discrepancies found or any comments that you feel will improve training. There will be no changes in this curriculum until authorized by the Chief of Naval Education and Training.

SAFETY PRECAUTIONS

Voltages present in the equipment are extremely dangerous. The delicacy of some equipment and the stringent ventilation requirements for solid-state electronic circuits must be continuously stressed. Safety must be part of each day of training so that the trainee will develop safe working habits. Practice and Teach Safety!

LESSON PLAN

ALLOCATION OF INSTRUCTIONAL TIME

Part No.	Section No.	Topic No.	Classroom Hours	Laboratory Hours	Topic Totals
S1273/1	1	1	1.00	0.00	
		2	4.00	0.00	
		3	3.00	0.00	
		Section Total	8.00	0.00	8.00
S1273/1	2	1	0.00	5.00	
		Section Total	0.00	5.00	5.00
S1274/1	1	1	2.00	0.00	
		2	2.00	0.00	
		Section Total	4.00	0.00	4.00
S4291	1	1	1.00	0.00	
		2	1.00	0.00	
		3	1.00	0.00	
		Section Total	3.00	0.00	3.00
S4291	2	1	1.00	0.00	
		Section Total	1.00	0.00	1.00
S4291	3	1	0.00	2.00	
		Section Total	0.00	2.00	2.00

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ALLOCATION OF INSTRUCTIONAL TIME - Continued.

Part No.	Section No.	Topic No.	Classroom Hours	Laboratory Hours	Topic Totals
S1277/2	1	1	1.00	0.00	
		Section Total	1.00	0.00	1.00
S1277/3	1	1	0.00	2.00	
		Section Total	0.00	2.00	2.00
S1277/3	2	1	1.00	0.00	
		Section Total	1.00	0.00	1.00
S1277/3	3	1	0.00	2.00	
		2	0.00	0.00	
		Section Total	0.00	2.00	2.00
S3706/3	1	1	1.00	0.00	
		Section Total	1.00	0.00	1.00
S3706/4	1	1	0.00	2.00	
		2	0.00	2.00	
		Section Total	0.00	4.00	4.00
S4292/2	1	1	1.00	0.00	
		Section Total	1.00	0.00	1.00

LESSON PLAN

ALLOCATION OF INSTRUCTIONAL TIME - Continued.

Part No.	Section No.	Topic No.	Classroom Hours	Laboratory Hours	Topic Totals
S4292/2	2	1	0.00	2.00	
		2	0.00	5.00	
		Section Total	0.00	7.00	7.00
S1274/3	1	1	0.00	2.00	
		2	1.00	0.00	
		Section Total	1.00	2.00	3.00
S1273/4	1	1	0.00	2.00	
		Section Total	0.00	2.00	2.00
S2789	1	1	1.00	0.00	
		2	1.00	0.00	
		3	11.00	0.00	
		4	2.00	0.00	
		Section Total	15.00	0.00	15.00
S2789	2	1	0.00	5.00	
		Section Total	0.00	5.00	5.00
S2789	3	1	1.00	0.00	
		2	1.00	0.00	
		Section Total	2.00	0.00	2.00

LESSON PLAN

ALLOCATION OF INSTRUCTIONAL TIME - Continued.

Part No.	Section No.	Topic No.	Classroom Hours	Laboratory Hours	Topic Totals
S2789	4	1	0.00	2.00	
		Section Total	0.00	2.00	2.00
S2789	5	1	0.00	5.00	
		2	0.00	11.00	
		Section Total	0.00	16.00	16.00
		Final Eval		0.00	0.00
		Instructional Time Total			119.00
		Testing Time Total			1.00
		Review Time Total			0.00
		Course Total			120.00

Note

Classroom and laboratory hours shown reflect the time used during curriculum pilot with an actual class size of 10 and a student/instructor ratio for laboratory periods of 10:1. These times may vary slightly at different activities due to different class loading or available resources. Actual times should be reflected on each activity's course master schedule.

LESSON PLAN

COURSE MASTER SCHEDULE

A-113-0125

WEEK 1
DAY 1

Length of period : 50 minutes

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1273/1-1-1	Class	1	General, Physical, and Documentation Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-2	Class	2	Functional and Interface Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-2	Class	3	Functional and Interface Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-2	Class	4	Functional and Interface Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-2	Class	5	Functional and Interface Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-3	Class	6	Operational Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-3	Class	7	Operational Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/1-1-3	Class	8	Operational Description of the Gun Weapon System (GWS) MK 34	10:1	

DAY 2

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1273/1-2-1	Lab	9	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(2/1)
S1273/1-2-1	Lab	10	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(2/1)

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COURSE MASTER SCHEDULE - Continued.

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1273/1-2-1	Lab	11	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(2/1)
S1273/1-2-1	Lab	12	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(2/1)
S1273/1-2-1	Lab	13	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(2/1)
S1274/1-1-1	Class	14	General, Physical, and Documentation Description of Gun Computer System (GCS) MK 160	10:1	
S1274/1-1-1	Class	15	General, Physical, and Documentation Description of Gun Computer System (GCS) MK 160	10:1	
S1274/1-1-2	Class	16	Functional and Interface Description of Gun Computer System (GCS) MK 160	10:1	

DAY 3

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1274/1-1-2	Class	17	Functional and Interface Description of Gun Computer System (GCS) MK 160	10:1	
S4291-1-1	Class	18	General, Physical, and Documentation Description of the Gun Console (GC)	10:1	
S4291-1-2	Class	19	Functional and Interface Description of the Gun Console (GC)	10:1	
S4291-1-3	Class	20	Operational Description of the Gun Console (GC)	10:1	
S4291-2-1	Class	21	Operational Description of the Gun Console (GC)	10:1	
S4291-3-1	Lab	22	Basic Operation and Casualty Operation of the Gun Console (GC)	10:1	(5/1)
S4291-3-1	Lab	23	Basic Operation and Casualty Operation of the Gun Console (GC)	10:1	(5/1)
S3706/1-1-1	Class	24	General, Physical and Documentation Description of the Recorder Reproducer (RCRP) Set MK 27	10:1	

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COURSE MASTER SCHEDULE - Continued.

DAY 4

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S3706/1-1-2	Class	25	Functional and Interface Description of the Recorder Reproducer (RCRP) Set MK 27	10:1	
S3706/1-1-3	Class	26	Operational Description of the Recorder Reproducer (RCRP) Set MK 27	10:1	
S3706/1-2-1	Lab	27	Operation of the Recorder Reproducer (RCRP) Set MK 27	10:1	(5/1)
S3706/1-2-1	Lab	28	Operation of the Recorder Reproducer (RCRP) Set MK 27	10:1	(5/1)
S3706/1-3-1	Class	29	Operational Description of the Recorder Reproducer (RCRP) Set MK 27	10:1	
S4292/1-1-1	Class	30	General, Physical and Documentation Description of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	
S4292/1-1-2	Class	31	Functional and Interface Description of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	
S4292/1-1-3	Class	32	Operational Description of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	

DAY 5

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S4292/1-2-1	Lab	33	Basic Operation of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	(5/1)
S4292/1-2-1	Lab	34	Basic Operation of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	(5/1)
S1277/1-1-1	Class	35	General, Physical, and Documentation Description of the Gun Mount Control Panel (GMCP) MK 437	10:1	
S1277/1-1-2	Class	36	Functional and Interface Description of the Gun Mount Control Panel (GMCP) MK 437	10:1	

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COURSE MASTER SCHEDULE - Continued.

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1273/2-1-1	Class	37	Operational Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/2-1-2	Class	38	Operational Description of the Gun Weapon System (GWS) MK 34	10:1	
S1273/2-2-1	Lab	39	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(5/1)
S1273/2-2-1	Lab	40	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(5/1)

WEEK 2
DAY 1

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1273/2-2-1	Lab	41	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(5/1)
S1273/2-2-1	Lab	42	Basic Operation of the Gun Weapon System (GWS) MK 34	10:1	(5/1)
S1273/3-1-1	Lab	43	Preventive Maintenance of the Gun Weapon System (GWS) MK 34	10:1	(5/1)
S1273/3-1-1	Lab	44	Preventive Maintenance of the Gun Weapon System (GWS) MK 34	10:1	(5/1)
S1274/2-1-1	Class	45	Operational Description of Gun Computer System (GCS) MK 160	10:1	
S1274/2-2-1	Lab	46	Operation of Gun Computer System (GCS) MK 160	10:1	(2/1)
S1274/2-2-1	Lab	47	Operation of Gun Computer System (GCS) MK 160	10:1	(2/1)
S1274/2-2-1	Lab	48	Operation of Gun Computer System (GCS) MK 160	10:1	(2/1)

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COURSE MASTER SCHEDULE - Continued.

DAY 2

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1274/2-2-1	Lab	49	Operation of Gun Computer System (GCS) MK 160	10:1	(2/1)
S1274/2-2-1	Lab	50	Operation of Gun Computer System (GCS) MK 160	10:1	(2/1)
S1274/2-2-2	Class	51	Maintenance Description of Gun Computer System (GCS) MK 160	10:1	
S1274/2-3-1	Lab	52	Casualty Operation of Gun Computer System (GCS) MK 160	10:1	(5/1)
S1274/2-3-1	Lab	53	Casualty Operation of Gun Computer System (GCS) MK 160	10:1	(5/1)
S3706/2-1-1	Lab	54	Operation of the Recorder Reproducer (RCRP) Set MK 27	10:1	(5/1)
S3706/2-1-1	Lab	55	Operation of the Recorder Reproducer (RCRP) Set MK 27	10:1	(5/1)
S1277/2-1-1	Class	56	Operational Description of the Gun Mount Control Panel (GMCP) MK 437	10:1	

DAY 3

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1277/3-1-1	Lab	57	Basic Operation of the Gun Mount Control Panel (GMCP) MK 437	10:1	(5/1)
S1277/3-1-1	Lab	58	Basic Operation of the Gun Mount Control Panel (GMCP) MK 437	10:1	(5/1)
S1277/3-2-1	Class	59	Maintenance Description of Gun Mount Control Panel (GMCP) MK 437	10:1	
S1277/3-3-1	Lab	60	Preventive Maintenance of Gun Mount Control Panel (GMCP) MK 437	10:1	(5/1)

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COURSE MASTER SCHEDULE - Continued.

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1277/3-3-1	Lab	61	Preventive Maintenance of Gun Mount Control Panel (GMCP) MK 437	10:1	(5/1)
S1277/3-3-2	Lab	62	Basic Corrective Maintenance of Gun Mount Control Panel (GMCP) MK 437	10:1	(5/1)
S1277/3-3-2	Lab	63	Basic Corrective Maintenance of Gun Mount Control Panel (GMCP) MK 437	10:1	(5/1)
S3706/3-1-1	Class	64	Maintenance Description of the Recorder Reproducer (RCRP) Set MK 27	10:1	

DAY 4

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S3706/4-1-1	Lab	65	Preventive Maintenance of the Recorder Reproducer (RCRP) Set MK 27	10:1	(5/1)
S3706/4-1-1	Lab	66	Preventive Maintenance of the Recorder Reproducer (RCRP) Set MK 27	10:1	(5/1)
S3706/4-1-2	Lab	67	Basic Corrective Maintenance of the Recorder Reproducer (RCRP) Set MK 27	10:1	(5/1)
S3706/4-1-2	Lab	68	Basic Corrective Maintenance of the Recorder Reproducer (RCRP) Set MK 27	10:1	(5/1)
S4292/2-1-1	Class	69	Maintenance Description of Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	
S4292/2-2-1	Lab	70	Preventive Maintenance of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	(5/1)
S4292/2-2-1	Lab	71	Preventive Maintenance of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	(5/1)
S4292/2-2-2	Lab	72	Basic Corrective Maintenance of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	(2/1)

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COURSE MASTER SCHEDULE - Continued.

DAY 5

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S4292/2-2-2	Lab	73	Basic Corrective Maintenance of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	(2/1)
S4292/2-2-2	Lab	74	Basic Corrective Maintenance of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	(2/1)
S4292/2-2-2	Lab	75	Basic Corrective Maintenance of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	(2/1)
S4292/2-2-2	Lab	76	Basic Corrective Maintenance of the Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)	10:1	(2/1)
S1274/3-1-1	Lab	77	Preventive Maintenance of the Gun Computer System (GCS) MK 160	10:1	(5/1)
S1274/3-1-1	Lab	78	Preventive Maintenance of the Gun Computer System (GCS) MK 160	10:1	(5/1)
S1274/3-1-2	Class	79	Basic Corrective Maintenance of the Gun Computer System (GCS) MK 160	10:1	
S1273/4-1-1	Lab	80	Basic Corrective Maintenance of Gun Weapon System (GWS) MK 34	10:1	(5/1)

WEEK 3

DAY 1

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck
S1273/4-1-1	Lab	81	Basic Corrective Maintenance of Gun Weapon System (GWS) MK 34	10:1	(5/1)
S2789-1-1	Class	82	General and Documentation Description of the Optical Sight System (OSS) MK 46	10:1	
S2789-1-2	Class	83	Physical Description of the Optical Sight System (OSS) MK 46	10:1	
S2789-1-3	Class	84	Functional and Interface Description of the Optical Sight System (OSS) MK 46	10:1	
S2789-1-3	Class	85	Functional and Interface Description of the Optical Sight System (OSS) MK 46	10:1	
S2789-1-3	Class	86	Functional and Interface Description of the Optical Sight System (OSS) MK 46	10:1	

COURSE LEARNING OBJECTIVES

Upon successful completion of this course, the trainees will have acquired the following knowledge and skills and be able to:

Knowledge:

1. Describe the theory and associated documentation necessary to support and understand the performance of casualty/degraded/abnormal operational tasks and operational tasks requiring advanced analysis, all routine preventive maintenance, and documented fault isolation and repair without going into detailed logic, circuit analysis, individual program flow diagrams, or detailed mechanical component breakdown of the
   a. Gun Weapon System (GWS) MK 34
   b. Gun Computer System (GCS) MK 160
   c. Gun Mount Control Panel (GMCP) MK 437
   d. Optical Sight System (OSS) MK 46
   e. Recorder Reproducer (RCRP) Set MK 27
   f. Gun Console (GC)
   g. Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)

Skills:

1. Perform normal operational procedures with supervision on the
   a. Gun Mount Control Panel (GMCP) MK 437
   b. Gun Console (GC)
   c. Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)

2. Perform all operational procedures with supervision on the
   a. Gun Weapon System (GWS) MK 34
   b. Gun Computer System (GCS) MK 160
   c. Optical Sight System (OSS) MK 46
   d. Recorder Reproducer (RCRP) Set MK 27

3. Perform preventive maintenance procedures with supervision on the
   a. Gun Weapon System (GWS) MK 34
   b. Gun Computer System (GCS) MK 160
   c. Gun Mount Control Panel (GMCP) MK 437
   d. Optical Sight System (OSS) MK 46
   e. Recorder Reproducer (RCRP) Set MK 27
   f. Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)

COURSE LEARNING OBJECTIVES - Continued.

Skills:

4. Perform documented fault isolation and repair procedures to the authorized maintenance level, with supervision, on the
   a. Gun Weapon System (GWS) MK 34
   b. Gun Computer System (GCS) MK 160
   c. Optical Sight System (OSS) MK 46
   d. Recorder Reproducer (RCRP) Set MK 27
   e. Gun Console Computer (GCC) and Gun Mount Processor (GMP) AN/UYK-44(V)

PART S1273/1

GUN WEAPON SYSTEM (GWS) MK 34

Section 1: INTRODUCTION TO THE GUN WEAPON SYSTEM (GWS) MK 34

LESSON PLAN

A-113-0125

1. GENERAL, PHYSICAL, AND DOCUMENTATION DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

LAB PERIODS: 0
CLASS PERIODS: 1

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. State the purpose of the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

2. Describe the modification differences of the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

3. Describe the organization, content, and use of the technical documentation provided for use with the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

   a. SW221-A1-MMO-010

4. Define the abbreviations, terms, and symbols used with the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

5. State the purpose of the major components of the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

   a. Gun Computer System (GCS) MK 160
   b. Optical Sight System (OSS) MK 46
   c. Gun System MK 45

6. Describe the major components of the Gun Weapon System (GWS) MK 34 including name, nomenclature, physical appearance, reference designators, and location to the detail required to support normal operation.

   a. Gun Computer System (GCS) MK 160
   b. Optical Sight System (OSS) MK 46
   c. Gun System MK 45

7. State the operational characteristics and capabilities of the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

8. Describe the controls, displays, indicators, and alarms of the Gun Weapon System (GWS) MK 34, including location and positions to the detail required to support normal operation.

9. State the security requirements of the Gun Weapon System (GWS) MK 34 to the detail required to support normal operation.

Trainee Preparation

A. Trainee Support Materials:
   1. None

B. Reference Publications:
   1. None

Instructor Preparation

PART S1273/2

GUN WEAPON SYSTEM (GWS) MK 34

Section 1: THEORY OF THE GUN WEAPON SYSTEM (GWS) MK 34

LESSON PLAN

1. THEORY OF THE GUN WEAPON SYSTEM (GWS) MK 34

A-113-0125

1. OPERATIONAL DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

LAB PERIODS: 0
CLASS PERIODS: 1

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. Describe the personnel and equipment safety precautions that are to be observed during maintenance of the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

2. Define the maintenance philosophy for the Gun Weapon System (GWS) MK 34, including the maintenance policy and management plan to the detail required to support preventive and documented corrective maintenance.

   a. Preventive maintenance
   b. Corrective maintenance

3. Describe the preventive maintenance procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

4. Describe the operational tests and diagnostic programs contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

5. Describe the recognition and interpretation of malfunction indications of the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

6. Describe the systematic fault isolation procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

7. Describe the disassembly, repair, and reassembly procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

8. Describe the post-repair procedures contained in prescribed maintenance documentation for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

9. Describe alignment, adjustment, and calibration procedures for the Gun Weapon System (GWS) MK 34 to the detail required to support preventive and documented corrective maintenance.

Trainee Preparation

A. Trainee Support Materials:
   1. None

B. Reference Publications:
   1. None

Instructor Preparation

A. Review Assigned Trainee Material.

LESSON PLAN

1. THEORY OF THE GUN WEAPON SYSTEM (GWS) MK 34

1. OPERATIONAL DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

B.   Reference Publications:
1.   MIP 4813/008 OPNAVINST 4790 (Series)
2.   SW221-A1-MMO-010
3.   SW224-A8-MMO-010

C.   Training Materials Required:
1.   None

1. THEORY OF THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

1. OPERATIONAL DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

DISCUSSION POINT	RELATED INSTRUCTOR ACTIVITY
1. Personnel and equipment safety precautions.	1. Reference SW221–A1–MMO–010 Safety Summary.
2. GWS maintenance philosophy.	2. Reference SW224–A8–MMO–010 Paragraph 6-2. The GWS maintenance philosophy is created by NAVSUP Instruction, the level of installed COTS, and through the input of the is-service and design engineering agents.
a. Preventive maintenance	a. Reference SW221–A1–MMO–010 Chapter 5.
b. Corrective maintenance	b. Reference SW221–A1–MMO–010 Chapter 6.
3. GWS preventive maintenance procedures.	3. Reference MIP 4813/008 OPNAVINST 4790 (Series) and review GWS MRs.

LESSON PLAN

1. OPERATIONAL DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

DISCUSSION POINT	RELATED INSTRUCTOR ACTIVITY
4. GWS operational tests and diagnostic programs.	4. Reference SW221–A1–MMO–010 Paragraph 6-3. Reference SW224-A8-MMO-010, Paragraph 6-3.3.3.2; Table 6-15 through 6-15F, Table 6-17, Table 6-19 Figures 6-10 through 6-15, Figures 6-19 through 6-29.
5. GWS malfunction indications.	5. Reference SW221–A1–MMO–010 Table 6-1.
6. GWS systematic fault isolation.	6. Reference SW221–A1–MMO–010 Table 6-1.
7. GWS disassembly, repair, and reassembly.	7. The GWS is made up of three constituent systems. Refer to the corresponding technical documentation for the system in which the fault is indicated.
8. GWS post-repair.	8. The GWS is made up of three constituent systems. Refer to the corresponding technical documentation for the system in which the fault is indicated.

LESSON PLAN

1. THEORY OF THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

1. OPERATIONAL DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

DISCUSSION POINT   RELATED INSTRUCTOR ACTIVITY

9.   GWS adjustment, and calibration procedures.   9.   Alignment procedures for the OSS are located in SW210-A1-
                                                           MMO-010. Alignment procedures for the Gun Mount MK 45
                                                           MOD 4 are located in SW323-F4-MMO-010. GCS alignment
                                                           procedures are located in SW224-A8-MMO-010.

10. Review and Summary

11. Assignment   11. Make study assignments if required.

LESSON PLAN

1. THEORY OF THE GUN WEAPON SYSTEM (GWS) MK 34

A-113-0125

2. OPERATIONAL DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

LAB PERIODS: 0
CLASS PERIODS: 1

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. Describe the personnel and equipment safety precautions that are to be observed during operation of the Gun Weapon System (GWS) MK 34 to the detail required to support casualty/degraded/abnormal/not-full-mission capable modes of operation.

2. Describe the Gun Weapon System (GWS) MK 34 casualty, degraded, and abnormal mode/s of operation to the detail required to support casualty/degraded/abnormal/not-full-mission capable modes of operation.

Trainee Preparation

A. Trainee Support Materials:
   1. None

B. Reference Publications:
   1. None

Instructor Preparation

A. Review Assigned Trainee Material.

B. Reference Publications:
   1. SW221-A1-MMO-010

C. Training Materials Required:
   1. None

LESSON PLAN

<u>1. THEORY OF THE GUN WEAPON SYSTEM (GWS) MK 34</u>   A-113-0125

2. OPERATIONAL DESCRIPTION OF THE GUN WEAPON SYSTEM (GWS) MK 34

DISCUSSION POINT	RELATED INSTRUCTOR ACTIVITY
1. Personnel and equipment safety precautions.	1. Reference SW221–A1–MMO–010 Safety Summary.
2. GWS casualty, degraded, and abnormal modes.	2. Reference SW221–A1–MMO–010 Paragraph 3-5.
3. Review and Summary	
4. Assignment	4. Make study assignments if required.

A-113-0125

Section 2: OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34

2. OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

1. BASIC OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34   LAB PERIODS: 4
                                                                    CLASS PERIODS: 0

Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. Adhere to personnel and equipment safety precautions during operation of the Gun Weapon System (GWS) MK 34 in accordance with casualty/degraded/abnormal/not-full-mission operational procedures.

2. Perform the Gun Weapon System (GWS) MK 34 casualty, degraded, and abnormal mode/s of operation in accordance with casualty/degraded/abnormal/not-full-mission operational procedures.

Trainee Preparation

A. Trainee Support Materials:
    1. None

B. Reference Publications:
    1. None

Instructor Preparation

A. Review Assigned Trainee Material.

B. Reference Publications:
    1. SW210-A1-MMO-010
    2. SW221-A1-MMO-010
    3. SW224-A8-MMO-010

C. Training Materials Required:
    1. Trainee Guide
    2. References:
        a. SW210-A1-MMO-010
        b. SW221-A1-MMO-010
        c. SW224-A8-MMO-010
    3. Equipment:
        a. Equipment listed in Job Sheet S1273/2–2–1–1

2. OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34   A-113-0125

1. BASIC OPERATION OF THE GUN WEAPON SYSTEM (GWS) MK 34

DISCUSSION POINT	RELATED INSTRUCTOR ACTIVITY
1. Safety	1. Reference SW221–A1–MMO–010 Safety Summary.
2. Personnel and equipment safety precautions.	2. Review Training Time Out (TTO) and all lab safety procedures.
3. GWS casualty, degraded, and abnormal modes.	3. Direct trainee to perform Job Sheet S1273/2–2–1–1.
4. Critique	
5. Assignment	5. Make study assignments if required.

PART S1273/3

GUN WEAPON SYSTEM (GWS) MK 34

Section 1.   PREVENTIVE MAINTENANCE OF THE GUN WEAPON SYSTEM (GWS) MK 34 (P1)

LESSON PLAN

Section 1: PREVENTIVE MAINTENANCE OF THE GUN WEAPON SYSTEM (GWS) MK 34

RESOURCE REQUIREMENTS LIST

COURSE: Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD
               1 Differences Course

A. Texts

Doc. No.	Title	Per Tr.	Per Inst.	Per Cl.
A-113-0125	Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course Lesson Plan. Prepared by PEO IWS3C.		1	
A-113-0125	Gun Computer System (GCS) MK 160 MOD 8/Optical Sight System (OSS) MK 46 MOD 1 Differences Course Trainee Guide. Prepared by PEO IWS3C.	1	1	

B. References

Doc. No.	Title	Per Tr.	Per Inst.	Per Cl.
MIP 4801/006 OPNAVINST 4790 (Series)	Preventive Maintenance Requirements for Gun Weapon System (GWS) MK 34 MOD 0 & 1	1	1	1
MIP 4813/007 OPNAVINST 4790 (Series)	Preventive Maintenance for Optical Sight System (OSS) MK 46 MOD 0 & 1	1	1	1
MIP 4813/008 OPNAVINST 4790 (Series)	Preventive Maintenance for Gun Computer System (GCS) MK 160 (MOD)	1	1	1
OPNAVINST 5510.10 (Series)	Information and Personnel Security Program Regulation	1	1	1
SE610-PV-MMO-010	Organizational Level Maintenance for Data Processing Set (DPS) AN/UYK-44(V)	1	1	1
SE610-PV-SUP-030	Technical Manual Supplement for Data Processing Set (DPS) AN/UYK-44(V)	1	1	1
SE685-CA-MMO-05A	Maintenance Manual for Command and Decision Console OJ-719(V)9/AN/UYQ-70(V)	1	1	1

RESOURCE REQUIREMENTS LIST - Continued.

Doc. No.	Title	Per Tr.	Per Inst.	Per Cl.
SE686-CA-MMO-050	Maintenance Manual for Command and Decision Console OJ-719(V)/UYQ-70(V)	1	1	1
SW210-A1-MMO-010	Technical Manual Optical Sight System MK 46 MOD 1	1	1	1
SW210-A1-MMO-020	Technical Manual Optical Sight System MK 46 MOD 1	1	1	1
SW221-A1-MMO-010	Maintenance Manual for Gun Weapon System MK 34 MOD 1	1	1	1
SW224-A8-MMO-010	Maintenance Manual for Gun Computer System MK 160 MOD 8	1	1	1
SW224-AA-MMO-A10	Technical Manual for Recorder Reproducer MK 27 MOD 1	1	1	1

C. Equipment

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	Command and Decision Console OJ-719(V)/UYQ-70(V) (p/o GCS MK 160 MOD 8)	7244436	$275,000 .00		SE686-CA-MMO-050			1
2.	Control and Display Console (CDC) MK 132 MOD 2 (p/o OSS MK 46 MOD 1)	006040525			SW210-A1-MMO-010/020			1
3.	Gun Computer System (GCS) MK 160 MOD 8	No Number			SW224-A8-MMO-010			1

RESOURCE REQUIREMENTS LIST - Continued.

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
4.	Gun Console Computer (GCC) AN/UYK-44(V) (EP/OSM) with Expansion Adapter Group (EAG) OF-174(V) (p/o GCS MK 160 MOD 8)	7221614-01	$495,000.00		SW224-A8-MMO-010, SE610-PV-MMO-010, SE610-PV-SUP-030			1
5.	Gun Mount Control Panel (GMCP) MK 437 MOD 1	7244531	$70,000.00		SW224-A8-MMO-010			1
6.	Gun Mount Processor (GMP) AN/UYK-44(V) (EP/OSM) (P/o GCS MK 160 MOD 8	7221614-01	$335,000.00		SW224-A8-MMO-010			1
7.	Optical Sight System (OSS) MK 46 MOD 1	0-006040005	$1,700,000.00		SW210-A1-MMO-010/020			1
8.	Recorder Reproducer (RCRP) MK 27 MOD 1 (p/o GCS MK 160 MOD 8)	7244867-1	$120,000.00		SW224-AA-MMO-010			1

D. **Films/Videotapes/Videodiscs**

Designator	Title	Running Time	Per Cl.
None			

RESOURCE REQUIREMENTS LIST - Continued.

E.   Graphics
1.   Transparencies

Transparency No.	Title		Per Cl.	Source		Figure No.
None						

2.   Slides.

Slide No.	Title		Per Cl.	Source		Figure No.
None						

3.   Wall Charts.

Wall Chart No.	Title		Per Cl.	Source		Figure No.
None						

F.   Hand Tools

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	General Purpose Hand Tools	N/A	$150.00		N/A	1	1	1

G.   Prefaulted Modules

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	S1277 #1 (GMCP) Failed Power Supply, Gun Mount Control Panel (GMCP) MK 437 MOD 1	20010006-015			SW224-A8-MMO-010	1	1	1
2.	S1277 #2 (GMCP) Failed Velocimeter Faile-Safe CCA	7625460	$2,000.00		SW224-A8-MMO-010	1	1	1

RESOURCE REQUIREMENTS LIST - Continued.

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
3.	S1277 #3 (GMCP) Failed Indicating Fuze Holder	FHL32W-11	$80.00		SW224-A8-MMO-010	1	1	1

H. Support Equipment

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	AEGIS Display System (ADS) Emulator (Briggs Box)	N/A	$72,000.00		None	1	1	1
2.	Gun Computer System Training Facility AN/UYK-44 (V) EP/OSM	7221614-01	$335,000.00		SE610-PV-MMO-010, SE610-PV-SUP-030	1	1	1
3.	Gun Mount Interface Tester (GMIT) Desktop Computer	N/A	$10,000.00		N/A	1	1	1
4.	Vacuum Cleaner, General Purpose	N/A	$100.00		None	1	1	1

I. Test Equipment

Item No.	Nomenclature	Part No.	Unit Cost	CAGE	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	Multimeter, Electronic, Digital, Fluke Corporation		$240.00		N/A	1	1	1

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RESOURCE REQUIREMENTS LIST - Continued.

J.   **Support Materials**
Instruction Sheets. All instruction sheets (i.e., Assignment Sheets, Job Sheets, etc.) are A-113-0125 series.

Identification No.	Instruction Sheet Type	Title	Per Tr.	Per Inst.	Per Cl.
	(All instruction sheets for this course are contained within Trainee Guide A-113-0125.)				

PROFILE ITEM-TO-TOPIC OBJECTIVE ASSIGNMENT CHART

Table	Item	TOS	Vol	Part	Sect	Topic	TLO	Test Item No.	Table	Item	TOS	Vol	Part	Sect	Topic	TLO	Test Item No.
S1273	1-1-1	T1		S1273/1	1	1	1		S1273	1-6-1-b	T2		S1273/2	1	1	2	
S1273	1-1-2	T1		S1273/1	1	1	5		S1273	1-6-2	T2		S1273/2	1	1	3	
S1273	1-1-2-a	T1		S1273/1	1	1	5		S1273	1-6-3	T2		S1273/2	1	1	4	
S1273	1-1-2-b	T1		S1273/1	1	1	5		S1273	1-6-4	T2		S1273/2	1	1	5	
S1273	1-1-2-c	T1		S1273/1	1	1	5		S1273	1-6-5	T2		S1273/2	1	1	6	
S1273	1-1-3	T1		S1273/1	1	1	4		S1273	1-6-6	T2		S1273/2	1	1	7	
S1273	1-1-4	T1		S1273/1	1	1	7		S1273	1-6-7	T2		S1273/2	1	1	8	
S1273	1-1-5	T1		S1273/1	1	1	2		S1273	1-6-8	T2		S1273/2	1	1	9	
S1273	1-1-6	T1		S1273/1	1	1	9		S1273	1-6-9	T2		S1273/2	1	1	1	
S1273	1-2-1	T1		S1273/1	1	1	6		S1273	1-7-1	T1		S1273/1	1	1	3	
S1273	1-2-2	T1		S1273/1	1	1	8		S1273	1-7-1-a	T1		S1273/1	1	1	3	
S1273	1-3-1	T1		S1273/1	1	2	3		S1273	1-7-1-b	T1		S1273/1	1	1	3	
S1273	1-3-2	T1		S1273/1	1	2	4		S1273	1-7-1-c	T1		S1273/1	1	1	3	
S1273	1-4-1	T1		S1273/1	1	2	1		S1273	1-7-1-d	T1		S1273/1	1	1	3	
S1273	1-4-2	T1		S1273/1	1	2	2		S1273	2-1-1	O1		S1273/1	2	1	2	
S1273	1-4-2-a	T1		S1273/1	1	2	2		S1273	2-1-1-a	O1		S1273/1	2	1	2	
S1273	1-4-2-b	T1		S1273/1	1	2	2		S1273	2-1-1-b	O1		S1273/1	2	1	2	
S1273	1-5-1	T1		S1273/1	1	3	2		S1273	2-1-1-c	O1		S1273/1	2	1	2	
S1273	1-5-2	T1		S1273/1	1	3	3		S1273	2-1-2	O1		S1273/1	2	1	3	
S1273	1-5-2-a	T1		S1273/1	1	3	3		S1273	2-1-3	O2		S1273/2	2	1	2	
S1273	1-5-2-b	T1		S1273/1	1	3	3		S1273	2-1-4	O1		S1273/1	2	1	4	
S1273	1-5-2-c	T1		S1273/1	1	3	3		S1273	2-1-5	O1		S1273/1	2	1	1	
S1273	1-5-3	T1		S1273/1	1	3	4		S1273	2-1-5	O2		S1273/2	2	1	1	
S1273	1-5-4	T2		S1273/2	1	2	2		S1273	2-2-1	P1		S1273/3	1	1	2	
S1273	1-5-5	T1		S1273/1	1	3	5		S1273	2-2-2	C1		S1273/4	1	1	2	
S1273	1-5-6	T1		S1273/1	1	3	1		S1273	2-2-3	C1		S1273/4	1	1	3	
S1273	1-5-6	T2		S1273/2	1	2	1		S1273	2-2-4	C1		S1273/4	1	1	4	
S1273	1-6-1	T2		S1273/2	1	1	2		S1273	2-2-5	C1		S1273/4	1	1	5	
S1273	1-6-1-a	T2		S1273/2	1	1	2		S1273	2-2-6	C1		S1273/4	1	1	6	

PROFILE ITEM-TO-TOPIC OBJECTIVE ASSIGNMENT CHART - Continued.

Table	Item	TOS	Vol	Part	Sect	Topic	TLO	Test Item No.
S1273	2-2-7	C1		S1273/4	1	1	7	
S1273	2-2-8	P1		S1273/3	1	1	1	
S1273	2-2-8	C1		S1273/4	1	1	1	
S1274	1-1-1	T1		S1274/1	1	1	1	
S1274	1-1-2	T1		S1274/1	1	1	5	
S1274	1-1-2-a	T1		S1274/1	1	1	5	
S1274	1-1-2-b	T1		S1274/1	1	1	5	
S1274	1-1-2-c	T1		S1274/1	1	1	5	
S1274	1-1-2-e	T1		S1274/1	1	1	5	
S1274	1-1-2-f	T1		S1274/1	1	1	5	
S1274	1-1-2-g	T1		S1274/1	1	1	5	
S1274	1-1-3	T1		S1274/1	1	1	4	
S1274	1-1-4	T1		S1274/1	1	1	7	
S1274	1-1-5	T1		S1274/1	1	1	2	
S1274	1-1-6	T1		S1274/1	1	1	9	
S1274	1-2-1	T1		S1274/1	1	1	6	
S1274	1-2-1-a	T1		S1274/1	1	1	6	
S1274	1-2-1-b	T1		S1274/1	1	1	6	
S1274	1-2-1-c	T1		S1274/1	1	1	6	
S1274	1-2-1-e	T1		S1274/1	1	1	6	
S1274	1-2-1-f	T1		S1274/1	1	1	6	
S1274	1-2-1-g	T1		S1274/1	1	1	6	
S1274	1-2-2	T1		S1274/1	1	1	8	
S1274	1-3-1	T1		S1274/1	1	2	3	
S1274	1-3-2	T1		S1274/1	1	2	4	
S1274	1-4-1	T1		S1274/1	1	2	1	
S1274	1-4-2	T1		S1274/1	1	2	2	
S1274	1-4-2-a	T1		S1274/1	1	2	2	
S1274	1-4-2-b	T1		S1274/1	1	2	2	

Table	Item	TOS	Vol	Part	Sect	Topic	TLO	Test Item No.
S1274	1-5-1	T1		S1274/2	1	1	2	
S1274	1-5-2	T1		S1274/2	1	1	3	
S1274	1-5-2-a	T1		S1274/2	1	1	3	
S1274	1-5-2-b	T1		S1274/2	1	1	3	
S1274	1-5-2-c	T1		S1274/2	1	1	3	
S1274	1-5-3	T1		S1274/2	1	1	4	
S1274	1-5-4	T2		S1274/2	2	1	4	
S1274	1-5-5	T1		S1274/2	1	1	5	
S1274	1-5-6	T1		S1274/2	1	1	1	
S1274	1-5-6	T2		S1274/2	2	1	1	
S1274	1-6-1	T2		S1274/2	2	2	2	
S1274	1-6-1-a	T2		S1274/2	2	2	2	
S1274	1-6-1-b	T2		S1274/2	2	2	2	
S1274	1-6-2	T2		S1274/2	2	2	3	
S1274	1-6-3	T2		S1274/2	2	2	4	
S1274	1-6-4	T2		S1274/2	2	2	5	
S1274	1-6-5	T2		S1274/2	2	2	6	
S1274	1-6-6	T2		S1274/2	2	2	7	
S1274	1-6-7	T2		S1274/2	2	2	8	
S1274	1-6-8	T2		S1274/2	2	2	9	
S1274	1-6-9	T2		S1274/2	2	2	1	
S1274	1-7-1	T1		S1274/1	1	1	3	
S1274	1-7-1-c	T1		S1274/1	1	1	3	
S1274	2-1-1	O1		S1274/2	2	1	3	
S1274	2-1-1-a	O1		S1274/2	2	1	3	
S1274	2-1-1-b	O1		S1274/2	2	1	3	
S1274	2-1-1-c	O1		S1274/2	2	1	3	
S1274	2-1-2	O1		S1274/2	2	1	5	
S1274	2-1-3	O2		S1274/2	3	1	2	

FAULT APPLICABILITY LIST

PART	SECT	TOS	EQUIPMENT	FUNCTION FAULTED	FAULT NO.	DOCUMENT
S4292/2	2	P1 / C1	Gun Console Computer (GCC) AN/UYK-44(V) (EP/OSM) with Expansion Adapter Group (EAG) OF-174(V) (p/o GCS MK 160 MOD 8)	Inoperative Clock	S4292/2-2-2-1	SE610-PV-MMO-010
S1274/3	1	C1	Gun Computer System (GCS) MK 160 MOD 8	Power Supply Failure	S1274/3-1-2-1*	MIP 4801/006 OPNAVINST 4790 (Series)

Note 1: The PART and SECT columns indicate the most appropriate location within the curriculum to use the fault.

Note 2: The asterisk in the Fault No. column indicates that fault is required for use in the curriculum.

Note 3: Faults approved for dual use are noted in the TOS column.

TAB A-6

TRAINEE GUIDE

INSTRUCTOR CHECK _____   SAT

Step 3. Return the equipment to its original operating condition.

INSTRUCTOR CHECK _____   SAT

TRIDENT Exterior Communications System (ECS) Control, Monitor, and Test Subsystem (CMT) Subsystem

TRAINEE GUIDE

August 1990

TRAINEE NAME PAGE

TRAINEE GUIDE

NAME _____

CLASS NUMBER _____

LIST OF EFFECTIVE ELEMENTS

Element No.	Change In Effect	Element No.	Change In Effect
Title Page	Original	F0147-7-1-2	Original
Trainee Name Page	Original		
List of Effective Elements	Original		
Letter of Promulgation	Original		
Change Record	Original		
Safety/Hazard Awareness Notice	Original		
Security Awareness Notice	Original		
Table of Contents	Original		
How to Use Your Trainee Guide	Original		
Course Learning Objectives	Original		
Course Master Schedule	Original		
F0147-1-1-1	Original		
F0147-1-2-1	Original		
F0147-1-2-2	Original		
F0147-5-3-1	Original		
F0147-7-1-1	Original		

LETTER OF PROMULGATION

CHANGE RECORD

Number and Description of Change	Entered By	Date

SAFETY/HAZARD AWARENESS NOTICE

All personnel involved in operation or maintenance of electronic equipment must be thoroughly familiar with the electronic equipment safety precautions contained in Electronic Installation and Maintenance Book, General, NAVSEA SE000-00-EIM-100, Section 3, and Naval Ships' Technical Manual, Chapter 300, S9086-KC-STM-010/CH-300, Section 2. In addition, attention is directed to the Navy Safety Program Instructions, OPNAVINST 5100.19 (series) and 5100.23 (series), and the safety training requirements contained in NPDCINST 5100.1 (series).

This equipment employs voltages, which are dangerous and may be fatal if contacted by operating or maintenance personnel. There are mechanical safety devices associated with this equipment that must be maintained in a constant state of readiness to preclude causing injury to personnel and/or damage to equipment. Extreme caution must be exercised when working with or handling this equipment. Some components are extremely heavy. Rigid pre-inspections must be made to handling equipment to ensure their safety and safety summaries must be read to the handling teams prior to conducting dangerous evolutions. Hazard awareness dictates that this equipment must always be viewed as an integral part of a system and not as a component. While every practical precaution has been incorporated into this equipment, it is not possible or practical to try to list every condition or hazard that you may encounter. Therefore, all operating or maintenance personnel must at all times observe as a minimum, the following:

DON'T SERVICE OR ADJUST ALONE

Under no circumstances will a person operate or maintain equipment without the immediate presence or assistance of another person capable of rendering aid. Unless under direct supervision of a qualified person, no person shall operate or maintain equipment for which he is unqualified.

DON'T TAMPER WITH INTERLOCKS

Reliance on interlock circuits to remove power from the equipment is never to be assumed. Until operation of the interlock is verified, equipment is assumed to be in the hazardous mode of operation. Under no circumstances will any access gate, door, or interlock switch be removed, bypassed, or modified in any way by other than authorized maintenance personnel and then only after observing proper tag-out procedures.

REPORT ALL HAZARDS

If at any time you detect a hazard, it is your responsibility to report the hazard to ensure that it is corrected. If at any time you detect a "new" or "suspected new" hazard, particularly due to equipment installation, modification, or repair, it is your responsibility to ensure that a SAFETYGRAM is submitted to the Naval Safety Center, Norfolk, VA, in accordance with OPNAVINST 5102.1 (series). This will ensure that this hazard will be investigated, publicized, or corrected, as required.

SAFETY/HAZARD AWARENESS NOTICE - Continued

Additionally, SSPINST 3100.1 (series) requires SWS personnel to submit special check TFRs when a potential or actual unsafe condition is noticed that could cause injury to personnel and/or damage to equipment. When a problem/failure occurs involving the safety of personnel or equipment and it cannot be immediately resolved by command/technical assistance on-site, the TFR data shall be transmitted to SSP and others by Naval Message.

SAFETY - "TRAINING TIME OUT"

In any training situation when a student or instructor expresses concern for personal safety, it is an indication that a need for clarification of procedures or requirements exists and a "Training Time Out" shall be called. An individual should verbally call "TRAINING TIME OUT" (TTO) if they detect a hazardous condition during any teaching session (lab or theory), or raise a clenched fist to indicate a "TRAINING TIME OUT" (TTO) if the verbal command cannot be heard. Training activities will be suspended until the hazardous situation has been examined and additional explanation and instruction has been provided to allow safe resumption of training. Caution should be used to ensure a halt to a procedure does not result in additional hazards. TTO follow-up procedures will be performed in accordance with CNPDCINST 5100.1 (Series).

PRE-MISHAP PLAN

The Pre-Mishap plan explains the procedures to follow and essential telephone numbers to call in case of an accident or emergency. It is located by the emergency exit in the laboratory.

SECURITY AWARENESS NOTICE

In the Event that classified information is added to this document as a result of instructor personalization, the document shall be marked and handled in accordance with the regulations of the latest edition of the Departmen of the Navy Supplement to the DoD Information Security Program Regulation OPNAVINST 5510.1

TABLE OF CONTENTS

HOW TO USE YOUR TRAINEE GUIDE

TRAINEE GUIDE

This publication is now in your custody and is for your use while learning theory of operation, adjustment, alignment, and maintenance of <ENTER YOUR OWN DESCRIPTIVE TEXT HERE>.

You may not mark any pages in this book except for Job Sheets, Diagram Sheets, Problem Sheets, and Trainee Name Page.

Upon completion of this course of instruction return this Trainee Guide to your instructor.

OTHER PUBLICATIONS

This publication supersedes NAVEDTRA 34067. Reference publications, OP 3665 series, contain most of the information needed for this equipment but were not prepared for training use.

This Trainee Guide was prepared to guide your training on this equipment and prepare you to use the equipment OPs in maintaining <ENTER YOUR OWN DESCRIPTIVE TEXT HERE>.

Several other pertinent publications will be referred to frequently during the course.

PRESENTATION OF COURSE MATERIAL

The course material on <ENTER YOUR OWN DESCRIPTIVE TEXT HERE> is divided into sections and topics, presented in a logical sequence. Adjustment, alignment, troubleshooting, and efficient use of maintenance aids (OPs and test equipment) is stressed. The knowledge and skills to be acquired are stated for each topic so that you can check your progress.

Assignments in OP 3665 series and other publications are given for study. The effectiveness of this Trainee Guide depends upon the conscientious accomplishment of the reading and study assignments in the reference publications.

WRITTEN AND PERFORMANCE TESTS

A testing program consisting of written and practical performance tests will be administered by the instructor.

SAFETY PRECAUTIONS

Voltages present in <ENTER YOUR OWN DESCRIPTIVE TEXT HERE> are extremely dangerous. Read the Safety Precautions carefully and be aware of dangerous voltages when working on the equipment. Practice safety while learning and while maintaining equipment. Take time to be safe.

SECURITY

HOW TO USE YOUR TRAINEE GUIDE - Continued

In the event that classified information is added to the Trainee Guide as a result of trainee notes, the Trainee Guide shall be marked and handled in accordance with the regulations of the latest edition of the Department of the Navy (DON) Information Security Program (ISP) Regulation (SECNAV M-5510.36).

COURSE LEARNING OBJECTIVES

Upon successful completion of this course, the trainee will have acquired the following knowledge and skills and will be able to:

KNOWLEDGE:

1. State the purpose, function and location, and describe the documentation of the Trident Exterior Communications System (ECS)

2. Describe the theory and associated documentation necessary to support and understand the performance of casualty/degraded/abnormal operational tasks and operational tasks requiring advanced analysis, all routine preventive maintenance, and documented fault isolation and repair without going into detailed logic, circuit analysis, individual program flow diagrams, or detailed mechanical component breakdown of the
    a.   Data Switching Subsystem
    b.   Trident Exterior Communications System (ECS) Support System Power Distribution Group
    c.   Towed Buoy Antenna AN/BRR-6

3. Describe the theory and associated documentation necessary to support all corrective maintenance without going into signal or electrical flow, computer instructions, or detailed mechanical component breakdown except for those mechanical or logic elements or circuits unique to the equipment or program of the Trident Exterior Communications System (ECS)

SKILL:

1. Perform normal operational procedures with supervision on the
    a.   Trident Exterior Communications System (ECS) Support System Power Distribution Group
    b.   Towed Buoy Antenna AN/BRR-6

2. Perform all operational procedures with supervision on the
    a.   Trident Exterior Communications System (ECS)
    b.   Data Switching Subsystem

3. Perform preventive maintenance procedures with supervision on the
    a.   Trident Exterior Communications System (ECS)
    b.   Data Switching Subsystem
    c.   Trident Exterior Communications System (ECS) Support System Power Distribution Group
    d.   Towed Buoy Antenna AN/BRR-6

4. Perform documented fault isolation and repair procedures to the authorized maintenance level, with supervision, on the Trident Exterior Communications System (ECS)

COURSE MASTER SCHEDULE

A-111-4251
Length of period : 50 minutes

WEEK 1
Day 1

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck Ratio
	Special	1	Introduction to Course and Training Facility	12:1	
F0147-1-1	Class	2	General & Physical Physical Description of the Trident Exterior Communications System (ECS)	12:1	
F0147-1-2	Class	3	Functional & Interface Description of the Trident Exterior Communications System (ECS)	12:1	
F0147-2-1	Class	4	Operational Description of the Trident Exterior Communications System (ECS)	12:1	
F0147-2-2	Lab	5	Basic Operation of the Trident Exterior Communications System (ECS)	12:1	6/2
F0147-2-2	Lab	6	Basic Operation of the Trident Exterior Communications System (ECS)	12:1	6/2
F0147-3-1	Class	7	General & Physical Description of the Trident Exterior Communications System (ECS)	12:1	
F0147-3-2	Class	8	Functional & Interface Description of the Trident Exterior Communications System (ECS)	12:1	

Day 2

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck Ratio
F0147-4-1	Class	9	Operational Description of the Trident Exterior Communications System (ECS)	12:1	
F0147-4-2	Lab	10	Operation of the Trident Exterior Communications System (ECS)	12:1	6/2
F0147-4-2	Lab	11	Operation of the Trident Exterior Communications System (ECS)	12:1	6/2
F0147-5-1	Class	12	Maintenance Description of the Trident Exterior Communications System (ECS)	12:1	
F0147-5-2	Lab	13	Preventive Maintenance of the Trident Exterior Communications System (ECS)	12:1	6/2
F0147-5-2	Lab	14	Preventive Maintenance of the Trident Exterior Communications System (ECS)	12:1	6/2
F0147-5-3	Lab	15	Basic Corrective Maintenance of the Trident Exterior Communications System	12:1	6/2

COURSE MASTER SCHEDULE - Continued

			(ECS)		
F0147-5-3	Lab	16	Basic Corrective Maintenance of the Trident Exterior Communications System (ECS)	12:1	6/2

Day 3

F0147-6-1	Class	17	Maintenance Description of the Trident Exterior Communications System (ECS)	12:1	
F0147-7-1	Class	18	General, Physical, Functional Interface & Documentation, Description of the Trident Exterior Communications System (ECS) Support System Power Distribution Group	12:1	
F0147-8-1	Class	19	Operational Description of the Trident Exterior Communications System (ECS) Support System Power Distribution Group	12:1	
F0147-8-2	Lab	20	Basic Operation of the Trident Exterior Communications System (ECS) Support System Power Distribution Group	12:1	6/2
F0147-8-2	Lab	21	Basic Operation of the Trident Exterior Communications System (ECS) Support System Power Distribution Group	12:1	6/2
F0147-9-1	Class	22	Maintenance Description of the Trident Exterior Communications System (ECS) Support System Power Distribution Group	12:1	
F0147-9-2	Lab	23	Preventive Maintenance of the Trident Exterior Communications System (ECS) Support System Power Distribution Group	12:1	6/2
F0147-9-2	Lab	24	Preventive Maintenance of the Trident Exterior Communications System (ECS) Support System Power Distribution Group	12:1	6/2

Day 4

F0147-10-1	Class	25	General, Physical, Functional, Interface & Documentation Description of the Data Switching Subsystem	12:1	
F0147-11-1	Class	26	Operational Description of the Data Switching Subsystem	12:1	
F0147-11-2	Lab	27	Basic Operation of the Data Switching Subsystem	12:1	6/2
F0147-11-2	Lab	28	Basic Operation of the Data Switching Subsystem	12:1	6/2
F0147-12-1	Class	29	General , Physical, Functional & Interface Description of the Data Switching Subsystem	12:1	

COURSE MASTER SCHEDULE - Continued

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck Ratio
F0147-13-1	Class	30	Operational Description of the Data Switching Subsystem	12:1	
F0147-13-2	Lab	31	Operation of the Data Switching Subsystem	12:1	6/2
F0147-13-2	Lab	32	Operation of the Data Switching Subsystem	12:1	6/2

Day 5

F0147-14-1	Class	33	Maintenance Description of the Data Switching Subsystem	12:1	
F0147-14-2	Lab	34	Preventive Maintenance of the Data Switching Subsystem	12:1	6/2
F0147-14-2	Lab	35	Preventive Maintenance of the Data Switching Subsystem	12:1	6/2
F0147-15-1	Class	36	General, Physical, Functional Interface & Documentation, Description of the Towed Buoy Antenna AN/BRR-6	12:1	
F0147-16-1	Class	37	Operational Description of the Towed Buoy Antenna AN/BRR-6	12:1	
F0147-16-2	Lab	38	Basic Operation of the Towed Buoy Antenna AN/BRR-6	12:1	6/2
F0147-16-2	Lab	39	Basic Operation of the Towed Buoy Antenna AN/BRR-6	12:1	6/2
	Special	40	Performance Test (P-8)	12:1	6/2

WEEK 2
Day 1

Topic No.	Type	Period	Topic Title	Ratio	BottleNeck Ratio
F0147-17-1	Class	41	General, Physical, Functional ,& Interface Description of the Towed Buoy Antenna AN/BRR-6	12:1	
F0147-17-2	Class	42	Operational Description of the Towed Buoy Antenna AN/BRR-6	12:1	
F0147-18-1	Class	43	Maintenance Description of the Towed Buoy Antenna AN/BRR-6	12:1	
	Special	44	Knowledge Test (K-11)	12:1	
F0147-18-2	Lab	45	Preventive Maintenance of the Towed Buoy Antenna AN/BRR-6	12:1	6/2
F0147-18-2	Lab	46	Preventive Maintenance of the Towed Buoy Antenna AN/BRR-6	12:1	6/2
	Special	47	Course Summary and Review	12:1	

COURSE MASTER SCHEDULE - Continued

	Specia l	48	Course Summary and Review	12:1	

Day 2

	Specia l	49	Comprehensive Test	12:1	
	Specia l	50	Comprehensive Test	12:1	
	Specia l	51	Performance Test	12:1	3/2
	Specia l	52	Performance Test	12:1	3/2
	Specia l	53	Performance Test	12:1	3/2
	Specia l	54	Performance Test	12:1	3/2
	Specia l	55	Graduation	12:1	

INFORMATION SHEET F0147-1-1-1

SAFETY POLICY FOR CONDUCTING TRAINING

A. INTRODUCTION

1. This information sheet is designed to provide you with an understanding of Navy policy regarding training safety.

2. This information sheet covers "Training Time Out" procedures that are to be used during the conduct of this course.

B. REFERENCES

1. CNETINST 1500.20 (Series), Safety Policy and Procedures for Conducting Training

C. INFORMATION

1. The mission of the Navy dictates the need for an aggressive training program to prepare personnel to perform professionally and competently in many high risk activities under diverse and possible adverse conditions. Potentially high risk training includes, but is not limited to, training requiring exposure to potentially hazardous conditions involving the environment (water entry, temperature extremes), atmosphere (fire fighting, use of solvents), explosives (weapons), electrical mechanical or hydraulic training devices or equipments.

2. It is the policy of the Chief of Naval Education and Training (CNET) to provide required training under controlled conditions, within practical and realistic limits, to obtain desired training outcomes while maintaining the maximum margin of safety. Included in this policy is the requirement that in the event a trainee is apprehensive of his personal safety while undergoing training, that concern shall be addressed.

3. TRAINING TIME OUT (TTO)

1. Any time a trainee or Instructor has apprehension concerning his personal safety or that of another, he shall verbally signal "TRAINING TIME OUT" to stop the exercise and receive or provide additional instruction as appropriate in accordance with CNETINST 1500.20 series.

OUTLINE SHEET F0147-1-2-1

GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

A. INTRODUCTION

This lesson will show how the AN/BRR-6 operates and its effect on
the system as a whole.

B. TOPIC LEARNING OBJECTIVES

Upon successful completion of this topic, you will be able to:

1. Describe how the ECS works (functional operation). Include types of signals, signal flow,
    modes, inputs and outputs, sequence of events, and protective devices to support normal
    operation.
2. Describe the functions of each control and indicator in each position, condition, and color to
    support normal operation.
3. Describe each program, subprogram, and routine used with the ECS. Include name,
    program number, and assumptions and constraints imposed to support normal operation.
    a. CP
    b. MP
    c. VLF
    d. On-line test
    e. Off-line utility package
4. Describe the functional interface between the ECS and related external equipment to
    support normal operation.
    a. Power sources
    b. Input signals
    c. Output signals
    d. Control signals

C. Topic Outline

1. ECS functional operation.

2. Functions of each control

    a. Position

    b. Condition

    c. Color

3. Functions of each indicator in each.

    d. Position

    e. Condition

    f. Color

4. Program, subprogram, and routine used with the ECS.

    a. CP

    b. MP

    c. VLF

    d. On-line test

    e. Off-line utility package

5. Functional interface

    a. Power sources

    b. Input signals

    c. Output signals

    d. Control signals

ASSIGNMENT SHEET F0147-1-2-2

GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

A. INTRODUCTION

This lesson will show how the AN/BRR-6 operated and its effect on the system as a whole.

B. TOPIC LEARNING OBJECTIVES

Upon successful completion of this topic, you will be able to:

1. Describe how the ECS works (functional operation). Include types of signals, signal flow, modes, inputs and outputs, sequence of events, and protective devices to support normal operation.
2. Describe the functions of each control and indicator in each position, condition, and color to support normal operation.
3. Describe each program, subprogram, and routine used with the ECS. Include name, program number, and assumptions and constraints imposed to support normal operation.
   a. CP
   b. MP
   c. VLF
   d. On-line test
   e. Off-line utility package
4. Describe the functional interface between the ECS and related external equipment to support normal operation.
   a. Power sources
   b. Input signals
   c. Output signals
   d. Control signals

C. STUDY ASSIGNMENT

1. Study EE125-FA-MMF-010/E110-BRR-6, FOMM Technical Manual Support Volume for Radio Receiving Set AN/BRR-6, Volumn 1 glossary; tables 1-1 and 2-1 through 2-7; paragraphs 1-1, 1-2, 1-2.1 through 1-2.12, and 1-3

2. Study NAVSEA S9SSB-X9-SSM-84E/(U)726V6P3B7E-1, Exterior Communications System - Normal Operating Procedures OI 637-11, paragraph 1-1. through 1-6; and figures 2-1 trough 2-8, 51-, and 5-3.

D. STUDY QUESTIONS

1.   How may units comprise the BRR-6?

2.   What is the frequency range of the BRR-6?

3.   What is the maximum speed allowable for towing the buoys?

4.   What is the maximum speed for launching a buoy?

5.   Is it good practice to stream the buoyant cable and fly a buoy at the same time?

6.   How many buoys are associated with each BRR-6?

7.   What is the minimum depth for launching a buoy?

8.   How much cable does each cable have?

9.   What does FOMM mean?

10. Which units of the BRR-6 are located in the IRR?

11. Which units of the BRR-6 are located in the Command and Control Center?

12. How many antennas are associated with the Towed Buoy?

13. What is the purpose of the Depth and Destruct Canister? Where is it located?

14. Which unit controls all the buoy electronics?

15. How close to the surface must the buoy be before Unit 10 can take over depth control?

16. How does Unit 9 (Towed Buoy antenna Control Unit) communicate with the buoy electronics?

17. Where are the tow cable cutters located?

18. Where does the BRR-6 receive its 115 vac 60 Hz power from?

19.   Do the navigation center signals go through the AIS
       cabinet in the IRR?

PROBLEM SHEET F0147-5-3-1

POWER SUPPLY PP-7474/BSC-1 TROUBLESHOOTING DOCUMENTATION

A. INTRODUCTION

This Problem Sheet will help you become proficient at
troubleshooting the Power Supply PP-7474/BSC-1 using the
authorized technical documentation.

B. EQUIPMENT

        None

C. REFERENCES

    1.   EE109-AL-MMO-010/W153-DSS, Data Switching Subsystem Operation and Maintenance
          Instructions, Volume 1

D. PROBLEM

Using the authorized technical documentation, list in logical order
the troubleshooting steps required to isolate the problem.

D. GIVEN

Each PP-7474/BSC-1 Power Supply malfunction can be identified and
isolated using the authorized technical documentation.

E. INITIAL CONDITIONS

An operator of the Data Switching Subsystem reports that the system
will power up but will not remain online.

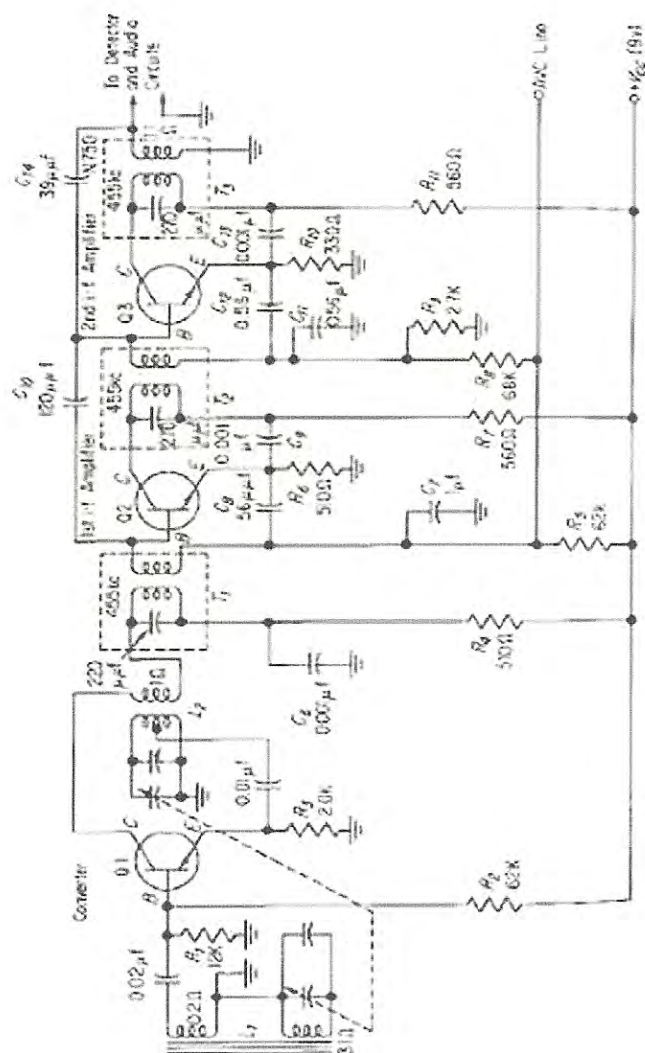F. REQUIRED RESPONSES

        1. Locate the symptom index

        _____

        2. Locate the symptom

        _____

3.   Where are the recommended tests and inspections located?

_____

_____

4.   Locate the "Troubleshooting and Diagnosing" chapter.

_____

5. Once the problem has been identified, the technical
   documentation and the steps required to correct the
   problem.

_____

_____

_____

DIAGRAM SHEET F0147-7-1-1

261B SCHEMATIC DIAGRAM

JOB SHEET F0147-7-1-2

POWER SUPPLIES PP-7474/BSC-1 AND PP-7475/BSC-1 ADJUSTMENT PROCEDURES

A. INTRODUCTION

    1. This job sheet will aid you in becoming proficient in
performing adjustments on the Power Supply PP-7474/BSC-1 to
support documented corrective maintenance.

    2. You will be evaluated on your observance of safety
precautions during performance of this job sheet. In addition,
strict adherence to documented procedures will be closely
monitored.

B. EQUIPMENT

    1.   Digital Multimeter, Fluke Model 8600A-01
    2.   AN/BSC-1 Trainer

C. REFERENCES

    1.   EE109-AL-MMO-010/W153-DSS, Data Switching Subsystem Operation and Maintenance
          Instructions, Volume 1

D. SELF-TEST QUESTIONS

E. JOB STEPS

Step 1. Perform the power supply voltage checks as described in
        paragraphs 6-2.a through 6-2.a(4) and table 6-2. Record your
        readings in the spaces provided. Inform the instructor of
        any out of tolerance readings.

PS1: _____   PS2: _____   PS3: _____

                INSTRUCTOR CHECK _____   SAT

Step 2. Perform the power supply voltages adjustments as described
        in paragraphs 6-2.a(5) through 6-2.a12) to correct the power
        supply(s) which are not within the specified tolerances.

TAB A-7

TEST PACKAGE

TESTING PLAN
FOR
TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)
MODEL CURRICULA

A-111-4251 REV A

PREPARED BY

TRIDENT TRAINING FACILITY, BANGOR
SILVERDALE, WA 98315-5400

PREPARED FOR

DEPUTY FOR SHORE/TECHNICAL TRAINING (CNET T2)
250 DALLAS STREET
PENSACOLA, FLORIDA 32508-5220

1 MAY 1990

A-7-2

MODEL CURRICULA
TESTS AND METHODS

The purpose of this Testing Plan is to establish procedures that will be used in evaluating the trainee's performance on attaining the objectives of the course. Performance for the A-111-4251 REV A course is measured by the following:

1. Written Progress Test
2. Performance Test
3. Practical Work

- Tests are as follows:

Written Progress Test: A written test with a minimum of 30 questions is administered at the end of Section 1, Topic 4. The following TLO's must be tested: 1-1-2, 1-1-4, 1-2-2, 1-2-4, 1-2-6, 1-2-8, 1-3-2, 1-3-4, 1-3-5, 1-4-2, and 1-4-3. Additional TLO's may be selected for testing to make up a test with a minimum of 30 questions.

Performance Test: A skill test is administered at the end of Section 2, Topic 1 utilizing Job Sheet F0/147-2-1-1 and Administrator Guide (minimum score of 70 percent is required).

Performance Test: A skill test is administered at the end of Section 3, Topic 1 utilizing Job Sheet F0/147-3-1-1 and Administrator Guide (minimum score of 70 percent is required).

Written Progress Test: A written test with a minimum of 30 questions is administered at the end of Section 4, Topic 5. The following TLO's must be tested: 4-1-2, 4-2-1, 4-2-3, 4-3-2, 4-3-3, 4-3-4, 4-3-5, 4-4-2, 4-5-3, 4-5-4, 4-4-5, 4-4-6, and 4-5-8. Additional TLO's may be selected for testing to make up a test with a minimum of 30 questions.

Performance Test: A skill test is administered at the end of Section 5, Topic 1 utilizing Job Sheet F0/147-5-1-1 and Administrator Guide (minimum score of 70 percent is required).

A-7-3

FOR TRAINING USE ONLY

TESTS AND METHODS (CONT)

Written Progress Test: A written test with a minimum of 30 questions is administered at the end of Section 6, Topic 3. The following TLO's must be tested: 6-1-2, 6-2-2, 6-3-2, 6-3-3, 6-3-4, 6-3-5, and 6-3-7. Additional TLO's may be selected for testing to make up a test with a minimum of 30 questions.

Performance Test: A skill test is administered at the end of Section 7, Topic 1 utilizing Job Sheet F0/147-7-1-1 and Administrator Guide (minimum score of 70 percent is required).

TESTING CONSTRAINTS

There are no constraints which prevent achievement of all course objectives.

PERFORMANCE TEST PROCEDURES AND NUMERICAL GRADE

Performance tests are administered individually. Performance tests are given to evaluate the trainee's overall skills taught in the course. The instructor/evaluator uses checklists and rating scales to evaluate the trainee. The standard for the performance tests is 70 percent. All critical steps must be performed without error. Trainees will be allowed one retake. Prior to the retake, the instructor will provide specific feedback to the trainee as to his or her performance on the failed test to allow the trainee to correct any problems. Additional practice may be required of the trainee prior to retaking the test. Trainees who are not able to meet the standard after the retest will be recommended for an Academic Review Board. Performance tests will be critiqued.

MINIMUM PASSING GRADE

All tests are criterion-referenced in that they measure the trainees' actual knowledge or performance against criteria derived from learning objectives. The minimum grade for the A-111-4251 REV A course is 70 percent, based on evaluation of the learning objectives and determination that the minimum passing grade needs to be at or above the point of average understanding.

A-7-4

FOR TRAINING USE ONLY

WEIGHTING CRITERIA FOR COMPUTING FINAL COURSE GRADES

```
Comprehensive Tests    30% X (Trainee's Grades) = _____
Performance Tests      60% X (Trainee's Grades) = _____
Practical Work         10% X (Trainee's Grades) = _____
                            Total = Final Course Grade:_____
```

WRITTEN PROGRESS TEST PROCEDURES

Written Progress tests are administered to the entire class. Results of the tests are used to evaluate the trainee's progress in the course. The minimum passing grade is 70 percent.

PRACTICAL WORK GRADES

Practical work grades for the course consist of graded homework and assignment sheets. The practical work grades will be averaged and will count as a percentage of the final grade as indicated on the Weighting Criteria area of this testing plan. If problem areas occur during practical work they will be remediated during class.

REMEDIATION

A trainee who scores at or above the minimum passing score will be immediately remediated in class to their specific problem areas. A trainee who scores below the minimum passing score will be subject to instructor oral remediation and night study. In addition the trainee will be retested as soon as possible. Trainees will be allowed one retake. Trainees who fail the retake will be recommended for an Academic Review Board.

Test to Objective to PPP Line Item Comparison

Part	Section	Lesson Topic	Objective	PPP Table	Test	Number	Version
F0147	1	4.1.4	1	1-6-1a	5020	12	1
F0147	1	4.1.4	2	1-6-3	5020	45	1
F0147	1	4.1.4	3	1-6-11	6112	10	3
F0147	3	4.1.1	1	2-2-2	5020	30	1
F0147	3	4.1.1	2	2-2-10	6112	15	3

TEST SCHEDULE

Period	Test Number
40	5020
55	6112
80	7103

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

A-111-4251

WRITTEN TEST ADMINISTRATORS GUIDE

WRITTEN TEST NO. 121A

OPERATIONAL DESCRIPTION OF THE DSS

August 1991

WRITTEN TEST ADMINISTRATOR'S GUIDE

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

A-111-4251

I. Instructions To Administrator

    A. Prior to the start of testing:

        1. Cover or Remove all training materials that could
           assist the trainees in answering test items.

        2. Inform trainees that they have 50 minutes for the
           test.

        3. Provide pencils and scratch paper as necessary.

        4. Read the test instructions to the trainees.

        5. Provide pertinent reference documentation.

        6. Honor local instruction pertinent to testing as
           applicable.

    B. After completing the test:

        1. Collect and inventory all testing material.

        2. Check test for marks made by trainees.

        3. Review test with trainees.

        4. Evaluate any test challenged by trainees.

        5. Apply local instructions as necessary.

II. EVALUATION INSTRUMENT: N/A

III. GRADING CRITERIA: As per NAVEDTRA 135, Appendix B7,
Translation of the Raw Score on a Written Test to a Grade.

A-7-8

FOR TRAINING USE ONLY

IV. INSTRUCTIONS TO THE TRAINEE

    A.   This is a completion or short answer test.
    B.   On the answer sheet print your name and social security number.
    C.   Anyone caught cheating fails and is subject to disciplinary action.
    D.   The time to take this test is 50 minutes.
    E.   This test completes Your Knowledge Course Learning Objective 1.

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

A-111-4251

WRITTEN TEST ADMINISTRATORS GUIDE

WRITTEN TEST NO. 121A

OPERATIONAL DESCRIPTION OF THE DSS

August 1991

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM

SECTION/TOPIC 1.1   TEST #11111
Date: October 1991 Revised

1. The function of the Power Distribution Group is to
_____.

2. List the major functional areas of the Power Distribution
Group.

    a.

    b.

    c.

    d.

    e.

3. The function of the AN/BRR-6 is to _____.

4. List the function of each to support normal operation of the
AN/BRR-6.

    a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-
        18A/BRR-6 (Kings Bay)

    b. Receiver Group OR-197/BRR-6

    c. Special Purpose Electrical Cable Assembly CX-130/53/
        BRR-6

    d. Buoy Cradle MT-490/5/BRR-6

    e. Reeling Machine RL-275/BRR-6

    f. Sensor Group OA-890/6/BRR-6

    g. Buoy Door Sensing Switch

    h. Buoy Control Indicator C-10/256A/BRR-6

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM

    i.   Antenna Control Indicator C-10/257/BRR-6

    j.   Buoy Depth Control Indicator C-10/258A/BRR-6

    k.   Relay Assembly RE-1115/BRR-6

    l.   Interconnecting Box J-3461/BRR-6

    m.   Towed Array Control Indicator Panel

> Questions 5 - 29 omitted for this example

4. Describe preventive maintenance procedures for the following:

    a.   Control, Monitor, and Test (CMT) Subsystem

        (1) Interface Unit J-3565/BSC-1 (Message Interface Unit)

        (2) Interface Unit J-3566/BSC-1 (Digital Interface Unit)

        (3) Interface Unit J-3568/BSC-1 (HASP/Magnetic Tape Unit
                                interface)

        (4) Recorder-Reproducer Control C-10/447/BSC-1

        (5) Recorder-Reproducer Unit RD-442/BSC-1

        (6) Comparator CM-50/7/BSC-1

    b.   Data Switching Subsystem (DSS)

        (1) SA-2199/BSC-1, SA-220/0//BSC-1, and SA-220/1/BSC-1
Switching Units

        (2) Signal Data Converter C-3510/B/U

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FOR TRAINING USE ONLY

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM

    c. Very Low Frequency/Low Frequency (VLF/LF) Subsystem

        (1) Radio Receiver R-210/9/BSC-1

        (2) Radio Receiver R-2320//UAR

        (3) Digital Data Processor C-10/71B/W

        (4) Digital Data Demodulator MD-1191/WAR-B

        (5) Electrical Equipment Enclosure C-8410//WAR-B

        (6) Power Supply PP-80/98/BSC-1

    d. High Frequency/Ultra High Frequency (HF/UHF) Subsystem

        (1) Radio Receiver-Transmitter R-110/7(V)12/WAC-3(V)

        (2) Voice Switch Unit Control C-10/975

        (3) Command Center Telephone Terminal

    e. Support Subsystem

        (1) Teleprinter T-624/U

        (2) Power Distribution Group

        (3) Audio Tape Recorder CMS 10/22

        (4) AN/BSC-1 Electronic Equipment Air Coolers subsystems
and Equipment

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

A-111-4251

PERFORMANCE TEST ADMINISTRATORS GUIDE

PERFORMANCE TEST NO. 121A

OPERATIONAL DESCRIPTION OF THE DSS

AUGUST 1991

PERFORMANCE TEST ADMINISTRATOR'S GUIDE

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

A-111-4251

I. <u>Instructions To Administrator</u>

    A. Prior to the start of testing:

       1. This job sheet will aid you in becoming proficient in performing adjustments on the Power Supply PP-7474/BSC-1 to support documented corrective maintenance.

       2. You will be evaluated on your observance of safety precautions during performance of this job sheet. In addition, strict adherence to documented procedures will be closely monitored.

       3. Inform trainees that they have 50 minutes for the test.

       4. Provide pencils and scratch paper as necessary.

       5. Provide pertinent reference documentation

       6. Honor local instruction pertinent to testing as applicable.

     EQUIPMENT

       1. AN/BSC-1 Trainer

       2. Test Equipment

        a. Digital Multimeter, Fluke Model 8600A-01, SCAN/SCAT 4212

       3. Tools

        a. Flat-tip screwdriver, 8-inch, 5/16-inch tip, LA 1613

    b. Offset screwdriver, NSN 5120-00-287-2130

    c. Open end wrench, 1/2-inch, 4-inch, LA 2516

    d. Phillips screwdriver, No. 2, 8-inch, LA 2838

  B. After completing the test:

    1. Collect and inventory all tools.

    2. Shut down all power supplies.

    3. Review test with trainees.

    4. Evaluate any test area challenged by trainees.

    5. Apply local instructions as necessary.

II. Evaluation Instrument

  A. Job sheet No. 4-5-1-1

  B. Steps: There are 2 steps to be evaluated: PE checks and PE adjustments.

  C. Description of errors: The most common error made by the trainee is reading multimeter wrong.

III. Grading Criteria

  A. Step 1 = checklist evaluation as satisfactory/unsatisfactory on the reading.

  B. Step 2 = Rating scale based on time, accuracy (+/-5%), safety, use of equipment, and procedures.

IV. Instructions to the Trainee

  A. Remember TTO Procedures. There is a 50-minute time limit.

  B. This job sheet will aid you in becoming proficient in performing adjustments on the Power Supply PP-7474/BSC-1 to support documented corrective maintenance.

C. You will be evaluated on your observance of safety precautions during performance of this job sheet. In addition, strict adherence to documented procedures will be closely monitored.

Performance Record Sheet

Name: _____

SSN: _____

Class No: _____

Start Time: _____

Stop Time: _____

Score: _____

JOB SHEET F0147-5-1-1

**POWER SUPPLIES PP-7474/BSC-1 AND PP-7475/BSC-1
ADJUSTMENT PROCEDURES**

A. INTRODUCTION

1. This job sheet will aid you in becoming proficient in performing adjustments on the Power Supply PP-7474/BSC-1 to support documented corrective maintenance.

2. You will be evaluated on your observance of safety precautions during performance of this job sheet. In addition, strict adherence to documented procedures will be closely monitored.

B. EQUIPMENT

1. AN/BSC-1 Trainer

2. Test Equipment

    a. Digital Multimeter, Fluke Model 8600A-01, SCAN/ SCAT 4212

3. Tools

    a. Flat-tip screwdriver, 8-inch, 5/16-inch tip, LA 1613

    b. Offset screwdriver, NSN 5120-00-287-2130

    c. Open end wrench, 1/2-inch, 4-inch, LA 2516

    d. Phillips screwdriver, No. 2, 8-inch, LA 2838

C. REFERENCES

1. EE109-AL-MMO-010/W153-DSS, Data Switching Subsystem Operation and Maintenance Instructions, Volume 1

JOB SHEET F0147-5-1-1
NOTES

The adjustment procedures for the Power Supply PP-7474/BSC-1 are identical to the adjustment procedures for the Power Supply PP-7475/BSC-1.

D. JOB STEPS

Step 1. Perform the power supply voltage checks as described in paragraphs 6-2.a through 6-2.a(4) and table 6-2. Record your readings in the spaces provided. Inform the instructor of any out of tolerance readings.

PS1: _____   PS2: _____   PS3: _____

Note: Instructor mark SAT/UNSAT.

INSTRUCTOR CHECK _____
SAT

Step 2. Perform the power supply voltage adjustments as described in paragraphs 6-2.a(5) through 6-2.a(12) to correct the power supply(s) which are not within the specified tolerances.

Use a 10 point rating scale:

a. Procedures_____
b. Safety_____
c. Accuracy_____
d. Use of equipment_____

INSTRUCTOR CHECK _____
SAT

Step 3. Return the equipment to its original operating condition.

INSTRUCTOR CHECK _____
SAT

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FOR TRAINING USE ONLY

TAB A-8

PILOT COURSE MONITORING REPORT

PILOT COURSE MONITORING REPORT

LOCATION: TRITRAFAC BANGOR
TITLE: Trident Exterior Communications System
PERIOD OF REPORT: 17 Mar – 22 May 91
CIN: A-111-4251

MONITORS/REPRESENTING: ETCS Trueman (Pilot Team Chairman)
         TRITRAFAC, BANGOR
         ETC Upton (Course Monitor)
         TRITRAFAC, BANGOR

I. ADMINISTRATION

 A. Facilities. The present facility at TRITRAFAC, BANGOR is large enough to accommodate 24 trainees. However, since the equipment utilized for the follow-on course can only accommodate 12 trainees, it is recommended that the Exterior Communications System class size be held to a maximum of 12 trainees.

 B. Safety: TTO and specific safety hazards were called out before each laboratory.

 C. Security: Not applicable as this course is unclassified.

 D. Allocation: This course can be taught in 9 weeks, as planned, with a total of 360 contact hours.

 E. Critique Sheets (Summary of trainee comments)

  1. Overall, trainee comments were favorable regarding the course content and the instructors.

  2. Trainees felt the skills and knowledge acquired from the course would be directly applied on the job.

  3. A number of trainees felt the course should have been a week longer in order to slow the pace down and provide more time for studying before the tests.

II. CURRICULUM VALIDATION

 A. Lesson Plan

1. This command scheduled a pilot and taught this course from 28 January to 10 April 1991. However, shortly into the pilot, the course monitors and LT Duncan, Deputy for Shore/Technical Training (NETC T2), all agreed that the lesson materials should be revised and a second course pilot conducted.

2. The following changes were made to the lesson materials prior to the repilot:

a. The revised Training Level Assignment (TLA) dated 4 December 1991 was utilized vice the TLA dated 8 November 1990.

b. More information supporting each of the main headings was included in the Lesson Plan. The informational bullets were included to assist the instructors in personalizing their Lesson Plan and in teaching the course.

c. Topics were resequenced for better teach ability and flow.

d. The Resource Requirements list was revised to accurately reflect required training materials.

e. PPP line items from Logistics Leadership and Management Table B0/ 61 were not included in the Lesson Plan. These items will be taught in General Military Training (GMT).

B.   Trainee Guide

1. The Trainee Guide was revised to correspond with the Lesson Plan and study questions on the reading assignments were included. The instructors reviewed the assigned study questions at the start of each day.

2. Due to the short turnaround time, the Trainee Guide used in the pilot was a cut-and-paste revision of the previous Trainee Guide.

3. It was decided that the trainees should write in the Trainee Guide and take it with them to their next command. While this will result in higher printing costs, it was determined that the revised Trainee Guide contains a considerable amount of valuable information that the trainees could use at their next command.

C. Equipment/Tools: All equipment and tools were adequate except the AN/ASM-4D Multimeter input impedances too low and gives inaccurate readings. Digital Voltmeter replacement will be required.

D. Instructional Media Materials: All transparencies will be screened for readability at 20 feet from the screen.

E. Instruction: The instructors were prepared to teach all of the lessons and the lessons were well presented, which kept the interest level high throughout the course.

F. Testing: Only one version of the test series was completed in time for the pilot. The course-testing officer has been tasked to develop alternate test series for the course.

III. INSTRUCTIONAL ACCURACY/ADEQUACY: Not applicable

IV. MINORITY REPORTS: None

V. OTHER: As the Monitoring Team Chairman, I recommend that this course be revised as is indicated by the redlined Lesson Plan. I recommend that all subsequently scheduled classes be taught using the redlined Lesson Plan until smooth copies are promulgated.

TAB A-9

EXERCISE CONTROLLER GUIDE

NOT SUPPORTED BY A LESSON PLAN

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TRIDENT COMMON NAVIGATION TECHNICIAN

COMPUTER BASED TRAINER

EXERCISE CONTROLLER GUIDE

1 JUNE 1996

PUBLISHED BY DIRECTION OF COMMANDER, NAVAL EDUCATION AND TRAINING COMMAND

A-9-3
FOR TRAINING USE ONLY

LIST OF EFFECTIVE PAGES

Exercise/ Page No.	Change in Effect	Exercise/ Page No.	Change in Effect	Exercise/ Page No.	Change in Effect	Exercise/ Page No.	Change in Effect
Title Page	Original	E3110-1	Original				
ii	Original	(1) thru (5)	Original				
Letter of Promulgation	Original						
iv thru xii	Original						
E3100-1	Original						
E3100-2	Original						
E3100-3	Original						
E3100-4	Original						
E3100-5	Original						
E3100-6	Original						
E3100-7	Original						
E3100-8	Original						
E3100-9	Original						
E3100-10	original						

CHANGE RECORD

	Number and Description of Change	Entered by	Date

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HAZARD AWARENESS NOTICE

All personnel involved in operation or maintenance of electronic equipment must be thoroughly familiar with the electronic equipment safety precautions contained in Electronic Installation and Maintenance Book, General, NAVSEA SE000-00-EIM-100, Section 3, and Naval Ships' Technical Manual, Chapter 300, S9086-KC-STM-010/CH-300, Section 2. In addition, attention is directed to the Navy Safety Program Instructions, OPNAVINST 5100.19 (series) and 5100.23 (series), and the safety training requirements contained in NETCINST 5100.1 (series).

This equipment employs voltages which are dangerous and may be fatal if contacted by operating or maintenance personnel. There are mechanical safety devices associated with this equipment that must be maintained in a constant state of readiness to preclude causing injury to personnel and/or damage to equipment. Extreme caution must be exercised when working with or handling this equipment. Some components are extremely heavy. Rigid pre-inspections must be made for handling equipment to ensure their safety, and safety summaries must be read to the handling teams prior to conducting dangerous evolutions. Hazard awareness dictates that this equipment must always be viewed as an integral part of a system and not as a component. While every practical precaution has been incorporated into this equipment, it is not possible or practical to try to list every condition or hazard that you may encounter. Therefore, all operating or maintenance personnel must at all times observe as a minimum, the following:

DON'T SERVICE OR ADJUST ALONE

Under no circumstances will a person operate or maintain equipment without the immediate presence or assistance of another person capable of rendering aid. Unless under direct supervision of a qualified person, no person shall operate or maintain equipment for which they are unqualified.

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HAZARD AWARENESS NOTICE

DON'T TAMPER WITH INTERLOCKS

    Reliance on interlock circuits to remove power from the equipment is never to be assumed. Until operation of the interlock is verified, equipment is assumed to be in the hazardous mode of operation. Under no circumstances will any access gate, door, or interlock switch be removed, bypassed, or modified in any way by other than authorized maintenance personnel and then only after observing proper tag-out procedures.

REPORT ALL HAZARDS

    If at any time you detect a hazard, it is your responsibility to report the hazard to ensure that it is corrected. If the hazard is detected during a teaching session, verbally call a "TRAINING TIME OUT" (TTO), raise a clenched fist if the verbal TTO signal cannot be heard. Stop any exercise if a trainee indicates a TTO. If at any time you detect a "new" or "suspected new" hazard, particularly due to equipment installation, modification, or repair, it is your responsibility to ensure that a SAFETYGRAM is submitted to the Naval Safety Center, Norfolk, VA in accordance with OPNAVINST 5102.1 (series). This will ensure that this hazard will be investigated, publicized, or corrected, as required. Additionally, SSPINST 3100.1 (series) requires SWS personnel to submit special check TFRs when a potential or actual unsafe condition is noticed that could cause injury to personnel and/or damage to equipment. When a problem/failure occurs involving the safety of personnel or equipment and it cannot be immediately resolved by command/technical assistance on-site, the TFR data shall be transmitted to SSP and others by Naval Message.

INFORM TRAINEES OF THEIR RESPONSIBILITY FOR SAFETY

    Inform trainees to verbally call a TTO if they detect a hazardous condition during any teaching session (lab or theory), or to raise a clenched fist to indicate a TTO if the verbal command cannot be heard.

E3100-1 COMPUTER BASED TRAINER INTRODUCTION

E3100-2 INERTIAL NAVIGATION PRINCIPLES

E3100-3 GLOBAL POSITIONING SYSTEM PRINCIPLES

E3100-4 CORRELATION VELOCITY PRINCIPLES

E3100-5 EM LOG CALIBRATION

E3100-6 NSS FIX TAKING

E3100-7 ESGN CALIBRATION

E3100-8 ESGN STARTUP

E3100-9 DUAL ESGN RETURN TO NAVIGATE

E3100-10   ESG AT-SEA REINITIALIZATION

E31110-1   ESGN ADVANCED FAULT ISOLATION

HOW TO USE THE EXERCISES

INTRODUCTION TO THE EXERCISE CONTROLLER GUIDE

This Exercise Controller Guide (ECG) is a compilation of independent exercises to be used with the Computer Based Trainer. Each exercise provides scenarios and selected procedures to accomplish specific, predetermined training objectives.

The exercises are designed to provide an effective means to develop and reinforce those skills required as a basic navigation watch stander. Each exercise supports a controller-to-trainee relationship (to be used by controller to conduct both individual or team training and assessment). The core of the ECG is a series of training exercises which can be used to sequentially represent a normal refit period and/or patrol period.

EXERCISE SELECTION

The key to using the ECG is of the process of selecting the exercises for use in training. Two methods are available for use by the school's instructional staff: the prescribed order identified by formal courseware or by use of the Exercise Selection Index (ESI).

The exercise selection by A-193-0375, A-193-0378, A-193-0379, A-193-0389, and A-193-0390 has been designed to represent those tasks, which would normally be executed/encountered during refit and patrol periods. The order of selection established will expose the trainee to those tasks, in the proper sequence, necessary to perform a refit and patrol.

The exercises contained in this ECG are used in conjunction with formal and informal courses of instruction: TRIDENT Common Navigation Technician Conversion (A-193-0375), TRIDENT Navigation Operator (A-193-0378), TRIDENT Navigation Maintenance (A-193-0379), ESGN Theory and Maintenance I (A-193-0389), ESGN Theory and Maintenance II (A-193-0390), and responsive training.

Many exercises may be applicable for use in other curricula and will be identified at a later date.

Exercise selection utilizing the index is an alternate method of selecting one or more exercises for a training program. Depending on the program and its purpose, exercises on a particular type of operational task or training level may be included which are suited to the individuals being trained. This method is useful when needed training emphasis is known.

EXERCISE SELECTION INDEX

EXERCISE NUMBER	EXERCISE OBJECTIVE	EXERCISE SCENARIO	SYS/SYBSYSTEM CONFIGURATION	EXER LENGTH (MIN)	TRNG LEVEL (TOS)	DIFF INDEX
E3100-1	To provide training necessary for students to operate the Computer Based Trainer Student Workstation	Computer Based Trainer Introduction	Computer Based Trainer	30	1	Basic
E3100-2	To provide training necessary for students to describe the inertial navigation principles used in the Navigation Subsystem	Inertial navigation Principles	Computer Based Trainer	60	T1	Basic
E3100-3	To provide training necessary for students to describe the three Global Positioning System (GPS) segments and concepts of GPS fix taking	Global Positioning System Principles	Computer Based Trainer	60	T1	Basic
E3100-4	To provide training necessary for students to describe the NSS Correlation SONAL principles used in the Navigation Subsystem for the D5 Weapon System	Correlation Velocity Principles	Computer Based Trainer	60	T1	Basic
E3100-5	To provide training necessary for students to perform normal and abnormal EM Log calibration procedures	EM Log Calibration	Computer Based Trainer	30 or 45	01 or 02	Basic or Advanced

EXERCISE TITLE SHEET

EXERCISE NO.	TITLE		SHEET
E3100-6	NSS FIX TAKING		X of 5

		Exercise Length (Min)
OBJECTIVE:		
		Training Level (TOS)
1. To provide training necessary for students to perform basic and advanced NSS fix taking procedures		
		Difficulty Index 01 or 02

REQUIREMENTS:	TRAINING APPROACH: Basic or Advanced
1. Equipment:	
a. Computer Based Trainer	This exercise demonstrates the operational tasks associated with NSS fix taking.
b. Parallel Rule	
c. Scotch Tape	
d. Tracing Paper	
	SPECIAL INSTRUCTIONS:
2. Publications:	
a. OD 61600, Vols. 1,3, and 4	
b. OP 4637, Vol. 5, Parts 1 and 2 (Kings Bay)	Instructors must have the Computer Based Trainer set up and students logged on as called out in Exercise E3100-1.
	Students must have completed Exercise E3100-1 prior to beginning this exercise. Inform the students that the Map Record Number (MRN) for this exercise is 55.

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EXERCISE TITLE SHEET (Continued)

EXERCISE NO.	TITLE:		Sheet
E3100-6	NSS FIX TAKING		xi of 5
OBJECTIVE:			Exercise Length (Min)
			Training Level (TOS)
			Difficulty Index
REQUIREMENTS:		TRAINING APPROACH:	
C. OP 4671, Vol 3, Parts 1 and 2 (Bangor)		SPECIAL INSTRUCTIONS:	
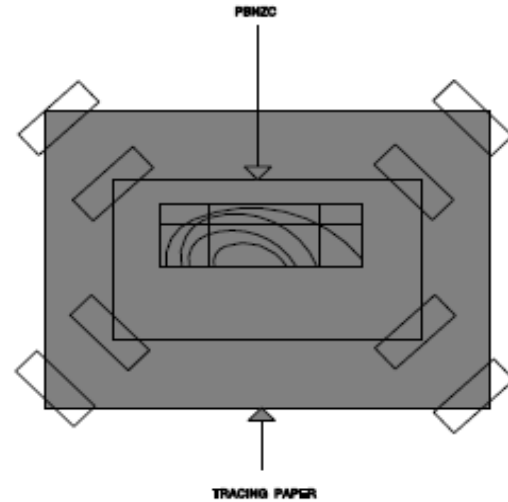
EXERCISE DATA SHEET

EXERCISE NO.	TITLE:	Sheet
E3100-6	NSS FIX TAKING	Xii of 5

A. Datasheet Index - Required for each student (Basic or Advanced)

   1. Zone Evaluation Datasheet (ZED) (Blank)

   2. Precise Bathymetric Navigation Zone (U) PBNZC LANT 12-123 (Kings Bay) or Precise Bathymetrics Navigation Zone (U) PBNZC PAC 12-123 (Bangor)

B. Typical Chart Layout at Student Workstation (Advanced)

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FOR TRAINING USE ONLY

EVENT-ACTIVITIES SHEET

EXERCISE NO.	TITLE:		Sheet
E3100-6	NSS FIX TAKING		Xiii of 5

Time	Event	Controller Activity	Operator Activity
Pre-comex	1. Class Options	1. Select **Lesson Options** and then **Class** From the Instructor's Status Monitoring Screen. On the Lesson Options screen, Select: a. under the Class group, the appropriate Class number b. under the Lesson group, **NSS Fix Taking** c. under the Options group, **Basic** or **Advanced** and **Enable lesson**	
Pre-0 comex	2. PBNZC Setup	2. For the Advanced option, direct the students To set up the PBNZC as illustrated on the Exercise Data Sheet.	2. Set up PBNZC.
Pre-comex	3. Course Selection	3. Refer to the Special Instructions on the Exercise Title Sheet of this exercise. Direct the students to select **Operation** for course selection.	3. Select **Operation**.

EVENT-ACTIVITIES SHEET (Continued)

EXERCISE NO. E3100-6	TITLE: NSS FIX TAKING		Sheet xiv of 5
Time	Event	Controller Activity	Operator Activity
T+0	4. Comex NSS Fix Taking	4. Direct the students to perform the exercise by selecting **NSS Fix Taking.**	4. Select **NSS Fix Taking.**
T+10	5. Set & Drift Compensation	5. For the Advanced Option, direct the students to plot the ship's position on the PBNZC as they transit the Feature Area and to notify CONN if a course change is required.	5. Plot Ship's position on the PBNZC.
T+90	6. Main Menu	6. Direct the students to return to the Main Menu upon completion of the lesson.	6. **EXIT** to the Main Menu upon completion of the lesson.
T+ as re-quired	7. Student Log Off	7. If required, direct the students to log off.	7. **EXIT** to the Log on screen.

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MASTER MATERIALS LIST

MASTER MATERIALS LIST

Course: TRIDENT Common Navigation Technician Computer Based Trainer

Class Size: Maximum of 10

A.   TEXTS

Navy No.	Title	Per Tr.	Per Inst.	Per Cl.
ECG-N5	TRIDENT Common Navigation Technician Computer Based Trainer Exercise Controller Guide prepared by Chief of Naval Education and Training		1	

B.   REFERENCES

Navy No.	Title	Per Tr.	Per Inst.	Per Cl.
OD 61600	TRIDENT SWS Common Navigation Standard Operating Procedures (CONFIDENTIAL DOCUMENT)	1	1	
OP 4637, Vol. 5, Part 1 Navigation Equipment (Kings Bay)	Navigation Training System for TRIDENT SWS Common	1		
OP 4637, Vol. 5, Part 2 Navigation Equipment (Kings Bay)	Navigation Training System for TRIDENT SWS Common	1	1	

B.   REFERENCES (Continued)

Navy No.	Title	Per Tr.	Per Inst.	Per Cl.
OP 4671, Vol. 3, Part 1 Navigation Equipment (Bangor)	Navigation Training System for TRIDENT SWS Common	1		
OP 4671, Vol. 3, Part 2 Navigation Equipment (Bangor)	Navigation Training System for TRIDENT SWS Common 1	1		
0652-026-7, Vol. 3, Parts 1 and 3	ESGN Mk 1 Mod 0 Description and Fault Isolation Support Data	1	1	
0652-026-8	ESGN Mk 1 Mod 0 Fault Isolation and Repair	1	1	
0652-027-4	ESGN Mk 1 Mod 0 Operation and Preventive Maintenance	1	1	
0652-031-5, Vol. 2, Parts 1, 2, and 4	TRIDENT SWS Common Navigation Subsystem	1	1	

MASTER MATERIALS LIST

C. EQUIPMENT

Item No.	Nomenclature	Part No.	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	Computer Based Trainer					1
2.	Parallel Rule			1		
3.	Scotch Tape					1
4.	Tracing Paper (roll)					1

D. OTHER

Item No.	Description	Per Tr.	Per Inst.	Per Cl.
1.	AAA Setup Datasheet (filled in)	1	1	
2.	Berthing Locations List	1	1	
3.	Data Ident: A_-2601, ESGN Optical Alignment Terms (filled in)	1	1	
4.	Data Ident: A_-2602, Polar Gyro Parameters Datasheet (blank)	1	1	
5.	Data Ident: A_-2602, Polar Gyro Parameters Datasheet (filled in)	1	1	
6.	Data Ident: A_-2603, Equatorial Gyro Parameters Datasheet (blank)	1	1	

MASTER MATERIALS LIST

G.   OTHER (Continued)

Item No.	Description	Per Tr.	Per Inst.	Per Cl.
7.	Data Ident: A_-2603, Equatorial Gyro Parameters Datasheet (filled in)	1	1	
8.	Data Ident: A_-2604, ESG Test Stand Parameters Datasheet (blank)	1	1	
9.	Data Ident: A_-2604, ESG Test Stand Parameters Datasheet (filled in)	1	1	
10.	Data Ident: A_-2605, EMA Calibration Worksheet (blank)	1	1	
11.	Data Ident: A_-2606, EMA/Platform/Optical Parameters Datasheet (blank)	1	1	
12.	Data Ident: A_-2606, EMA/Platform/Optical Parameters Datasheet (filled in)	1	1	
13.	Precise Bathymetric Navigation Zone (U) PBNZC LANT 12-123 (Kings Bay)	1	1	
14.	Precise Bathymetric Navigation Zone (U) PBNZC PAC 12-123 (Bangor)	1	1	
15.	Worksheet 2-1, Optical Calibration Case Mirror to ORA Worksheet (blank)	1	1	
16.	Worksheet 2-2, Optical Calibration U Mirror Worksheet (blank)	1	1	
17.	Worksheet 92-1 (blank)	1	1	
18.	Zone Evaluation Datasheet (ZED) (blank)	1	1	

MASTER MATERIALS LIST (Continued)

G.   OTHER (Continued)

Item No.	Description	Per Tr.	Per Inst.	Per Cl.
7.	Data Ident: A_-2603, Equatorial Gyro Parameters Datasheet (filled in)	1	1	
8.	Data Ident: A_-2604, ESG Test Stand Parameters Datasheet (blank)	1	1	
9.	Data Ident: A_-2604, ESG Test Stand Parameters Datasheet (filled in)	1	1	
10.	Data Ident: A_-2605, EMA Calibration Worksheet (blank)	1	1	
11.	Data Ident: A_-2606, EMA/Platform/Optical Parameters Datasheet (blank)	1	1	
12.	Data Ident: A_-2606, EMA/Platform/Optical Parameters Datasheet (filled in)	1	1	
13.	Precise Bathymetric Navigation Zone (U) PBNZC LANT 12-123 (Kings Bay)	1	1	
14.	Precise Bathymetric Navigation Zone (U) PBNZC PAC 12-123 (Bangor)	1	1	
15.	Worksheet 2-1, Optical Calibration Case Mirror to ORA Worksheet (blank)	1	1	
16.	Worksheet 2-2, Optical Calibration U Mirror Worksheet (blank)	1	1	
17.	Worksheet 92-1 (blank)	1	1	
18.	Zone Evaluation Datasheet (ZED) (blank)	1	1	

PROFILE ITEM-TO-EXERCISE OBJECTIVE ASSIGNMENT CHART

TABLE	ITEM/ SUBITEM	TRNG LEVEL (TOS)	ECG VOL	EXERCISE NO.	EXER OBJ	TABLE	ITEM/ SUBITEM	TRNG LEVEL (TOS)	ECG VOL	EXERCISE NO.	EXER OBJ
E3100	1-1-5										
	a	T1		E3100-2	1	E3110	2-2-1	C1		E3110-1	1
	b	T1		E3100-3	1	E3110	2-2-1	C2		E3110-1	1
	d	T1		E3100-4	1	E3110	2-2-3	C1		E3110-1	1
	2-1-1	01				E3110	2-2-3	C2		E3110-1	1
	b	02		E3100-6	1	E3110	2-2-4	C1		E3110-1	1
	b	01		E3100-6	1	E3110	2-2-4	C2		E3110-1	1
	e	01		E3100-5	1	E3110	2-2-5	C1		E3110-1	1
	e	01		E3100-7	1	E3110	2-2-6	C1		E3110-1	1
	2-1-2	02		E3100-5	1	E3110	2-2-7	C1		E3110-1	1
	2-1-2	02		E3100-7	2	E3110	2-2-9	C2		E3110-1	1
	2-1-2	02		E3100-8	1	E3110	2-2-10	C1		E3110-1	1
	2-1-2	02		E3100-9	1	E3110	2-2-10	C2		E3110-1	1
	2-1-2	02		E3100-10	1						

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TAB A-10

EXERCISE CONTROLLER GUIDE

SUPPORTED BY A LESSON PLAN

TORPEDOMAN TRAINING

INSTRUCTOR GUIDE

1 JUNE 1996

This example shows that the CCA has authorized use of the Optional Name—INSTRUCTOR GUIDE.

PUBLISHED BY COMMANDER, NAVAL EDUCATION AND TRAINING COMMAND,
LEARNING AND DEVELOPMENT DIVISION (N7)

A-10-2

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LIST OF EFFECTIVE PAGES

Page No.	Change in Effect	Page No.	Change in Effect	Page No.	Change in Effect	Page No.	Change in Effect
Title Page	Change 5	2C01-1-2-1, 2C01-1-2-2	Change 3	2C06-1-1-4 thru 2C06-1-1-14	Change 3	M203-1-2-3 thru M203-1-2-13	Change 4
ii thru iiB	Change 5	2C01-1-2-3, 2C01-1-2-4	Change 5	2C06-1-1-15, 2C06-1-1-16	Change 5	M203-1-2-14 thru M203-1-2-18	Change 3
Letter of Promulgation	Original	2C01-1-2-5 thru 2C01-1-2-21	Change 3	2C06-1-1-17 thru 2C06-1-1-24	Change 3	M203-1-3-1 thru M203-1-3-22	Change 3
iv	Original	2C01-1-2-22	Change 4				
v	Change 3	2C01-1-2-23 thru 2C01-1-2-28	Change 3	Tab Part M203	Change 3	M203-1-4-1 thru M203-1-4-6	Change 3
vi	Change 4			M203-1-1	Change 4		
vii	Change 3	Tab Part 2C06	Change 3	M203-1-2	Change 3	M203-1-5-1, M203-1-5-2	Change 5
viii thru xxvi	Change 5	2C06-1-1, 2C06-1-2	Change 3	M203-1-1-1, M203-1-1-2	Change 5	M203-1-5-3 thru M203-1-5-5	Change 3
Tab Part 2C01	Change 5	2C06-1-1-1 thru 2C06-1-1-3	Change 5	M203-1-1-3 thru M203-1-1-12	Change 3	M203-1-5-6, M203-1-5-7	Change 5
2C01-1-1, 2C01-1-2	Change 3			M203-1-2-1, M203-1-2-2	Change 5	M203-1-5-8	Change 3
2C01-1-1-1 thru 2C01-1-1-18	Change 5						

FOR TRAINING USE ONLY

LIST OF EFFECTIVE PAGES (Continued)

Page No.	Change in Effect	Page No.	Change in Effect	Page No.	Change in Effect	Page No.	Change in Effect
M203-1-6-1 thru M203-1-6-4	Change 3						
M203-1-7-1 thru M203-1-7-6	Change 3						
(1) thru (18)	Change 5						iii

CHANGE RECORD

Number and Description of Change	Entered by	Date

A-10-5

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COURSE LEARNING OBJECTIVES

Upon successful completion of this course, the trainees will acquire the following knowledge and skills and be able to:

Knowledge		Skills

1. State the purpose, function, and location and describe the documentation of the:
    a. Torpedo Launching System
    b. MK 48 Torpedo Ancillary Equipment
    c. Ordnance Handling Equipment
		1. Perform all operational procedures with supervision on the:
		    a. Torpedo Launching System
		    b. MK 48 Torpedo and Related Equipment:
		        (1) OTTO fuel spill procedures
		        (2) Hot Run
		    c. Ordnance Handling Equipment

2. Describe the theory necessary to support and understand the performance of all operational tasks, and basic corrective maintenance without going into detailed logic, circuit analysis, individual program flow diagrams, or detailed mechanical component breakdown of the:
    a. Torpedo Launching System
    b. MK 48 Torpedo and Ancillary Equipment
    c. Ordnance Handling Equipment
		2. Perform documented fault isolation and repair procedures with supervision on the:
		    a. MK 48 Torpedo and Related Equipment
		    b. Torpedo Launching System
		    c. Ordnance Handling Equipment

TORPEDO LAUNCHING SYSTEM

This part contains information from PPP tables 2CO1, 2CO6, and M2O3.

SECTION 1.   THEORY AND OPERATION OF TORPEDO LAUNCHING SYSTEM (t1, T2, O1, O2)

CHANGE 5
A-123-0001

A-10-7

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_____

SECTION 1. THEORY AND OPERATION OF THE TORPEDO LAUNCHING SYSTEM (TLS)

FOR TRAINING USE ONLY

1-2. THEORY OF THE TORPEDO LAUNCHING SYSTEM   A-123-0001

TOPIC 2. GENERAL, PHYSICAL, FUNCTIONAL INTERFACE, AND OPERATIONAL DESCRIPTION AND OPERATIONS OF THE TORPEDO LAUNCHING SYSTEM

<u>Topic Learning Objectives</u>

Upon successful completion of this topic, the trainee will be able to:

1. State the purpose of the Torpedo Launching System to support normal operation.

2. State the components of the Torpedo Launching System to support normal operation, including the function of each.

    a. MK 68 Torpedo Tube
    b. Defensive Weapons Launch Console (DWLC)
    c. MK 17 Torpedo Ejection Pump (TEP)
    d. Guidance Wire Streamed Detector System

3. State the security requirements for the Torpedo Launching System to support normal operation.

4. Define the abbreviations, terms, and symbols used with the Torpedo Launching System to support all operations.

5. State the operational characteristics, capabilities, and limitations of the Torpedo Launching System to support all:

    a. Modes of operation
    b. Types of weapons/devices

6. Describe all major and associated components of the Torpedo Launch System to support all operations.

    a. Barrel
    b. Breech door and breech door mechanism
    c. Muzzle door and muzzle door mechanism
    d. Slide valve
    e. Stop mechanism
    f. Interlock mechanism
    g. Turbine ejection system
    h. Control valves
    i. Shutter door assembly
    j. Port/stbd miscellaneous valve position panels
    k. Indicator panel
    l. Ejection pump fuse panel
    m. Port/stbd torpedo tube fuse panels
    n. Weapon Launch Console MK 96 Mod 0
    o. Port/stbd torpedo tube control panels
    p. Power supply sections
    r. Guidance wire streamed detector

2CO1-1-2-1

FOR TRAINING USE ONLY

TOPIC 2. GENERAL, PHYSICAL, FUNCTIONAL INTERFACE, AND OPERATIONAL DESCRIPTION AND
OPERATIONS OF THE TORPEDO LAUNCHING SYSTEM

7. Describe the functional operation of the Torpedo
Launching System to support all operations,
including control, sequential operation, and
indications.

    a. Prelaunch
    b. Launch
    c. Postlaunch

8. Describe the function of each control, indicator,
and actuator of the Torpedo Launching System in
each position, condition, and color to support all
operations. Include name, reference designator and
indications.

9. Describe the physical and functional interface
between the Torpedo Launching System and other
equipment/subsystem and systems to support all
operations to include:

    a. Power Sources
    b. Pneumatics
    c. Hydraulics
    d. Water
    e. Valves
    f. Manifolds

10. Describe authority, and regulations, and personnel
and equipment safety precautions which are to be
observed during all operations of the Torpedo
Launching System. Include Electrostatic Discharge.

11. Describe normal operational tasks of the Torpedo
Launching System as contained in applicable
documentation.

    a. Prelaunch procedures
    b. Launch procedures
    c. Postlaunch procedures

12. Describe indications which should or may occur
during all operations of the Torpedo Launching
System as contained in applicable documentation,
including alarms and indicators.

13. Describe tasks for casualty operation of the
Torpedo Launching System as contained in applicable
documentation.

14. Perform tasks for operation of the Torpedo
Launching System to include prelaunch, launch, and
postlaunch procedures to support normal operations.

15. Recognize and interpret all indications occurring
during the performance of the operating procedures
and perform appropriate operator actions to support
all operations.

2CO1-1-2-1

A-10-10

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TOPIC 2.   GENERAL, PHYSICAL, FUNCTIONAL INTERFACE, AND OPERATIONAL DESCRIPTION AND OPERATIONS OF THE TORPEDO LAUNCHING SYSTEM

16.   Perform tasks for casualty operation of the Torpedo Launching System.

17.   Describe Training Safety to include Training Time Out (TTO).

Trainee Preparation

A.   Trainee Support Material:

1.   None

B.   Reference Publications:

1.   None

C.   Reference Drawings:

1.   None

Instructor Preparation

A.   Review Assigned Trainee Material.

B.   Reference Publications:

1.   NAVSEA OD 44979, Vol. 4
2.   NAVSEA OD 4288, Vol. 1

3.   NAVSEA S9SSB-X9-SSM-BEO/(U)726V2P3C9 (SSM V2P3C9)
4.   NAVSEA S9SSB-X9-SSM-RDO/(U)726V6P3B3B (SSM V6P3B3B)
5.   NAVSEA 0987-LP-059-6010
6.   OPNAVINST 5510.1 Series
7.   NAVSEA OD 44979 Vol. 1, Part 1
8.   COMSUBLANT/PACINST C8500.4 Series
9.   NAVSEA SW282-DO-MMO-010/FCS MK 118/0
10.   NAVSEA SW519-AA-MMA-010/TTCC
11.   NAVSEA S9558-AA-MMA-030
12.   NAVSEA S9558-AA-MMA-060
13.   NAVSEA S9558-AA-MMA-100
14.   NAVSEA 0947-LP-247-1010
15.   CNTECHTRA-ST1, Vol. 39
16.   CNETINST 1500.20

C.   Training Materials Required:

1.   ECG-W1

2.   Publications:

a.   NAVSEA OD 44979, Vol. 4
b.   NAVSEA OP 4288, Vol. 1
c.   NAVSEA S9SSB-X9-SSM-BEO/(U)726V2P3C9 (SSM V2P3C9)

2CO1-1-2-1

TOPIC 2.   GENERAL, PHYSICAL, FUNCTIONAL INTERFACE, AND OPERATIONAL DESCRIPTION AND
OPERATIONS OF THE TORPEDO LAUNCHING SYSTEM

d.   NAVSEA S9SSB-X9-SSM-RDO/(U)726V6P3B3B   5.   Equipment:
(SSM V6P3B3B)
e.   NAVSEA 0987-LP-059-6010   a.   Torpedo Tube Trainer Laboratory
f.   NAVSEA OD 44979, Vol. 1   b.   Stop Watch
g.   NAVSEA SW519-AA-MMA-010/TTCC   c.   Simpson 260 or Fluke

3.   Films:

a.   MK17/0 Ejection System
b.   Electrostatic Discharge (ESD)

4.   Transparencies:

a.   2C01-1-1-1
b.   2C01-1-1-2
c.   2C01-1-1-3
d.   2C01-1-1-4
e.   2C01-1-1-5
f.   2C01-1-1-6
g.   2C01-1-1-7
h.   2C01-1-1-8
i.   2C01-1-1-9
j.   2C01-1-1-10
k.   2C01-1-1-11

2CO1-1-2-1

A-10-12

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1-2.   THEORY OF THE TORPEDO LAUNCHING SYSTEM

TOPIC 2.   GENERAL, PHYSICAL, FUNCTIONAL INTERFACE, AND OPERATIONAL DESCRIPTION AND OPERATIONS OF THE TORPEDO LAUNCHING SYSTEM

DISCUSSION POINT	RELATED INSTRUCTOR ACTIVITY
11. Safety precautions	11. Refer to SSM V2P3C9, paragraph 3.1. Reference NAVSEA OP 4288 Vol. 1, pages xi and xii and CNETINST 1500.20.
a. Personnel	
(1) TTO signals (verbal/gestures) (2) Mishap Plan	
	NOTE
	Take class to lab to perform exercises in ECG-W1, insure required tools and equipment are in lab.
b. Equipment	
	NOTE
	Stress Safety.
12. Operation	

2CO1-1-2-1

A-10-13

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**TOPIC 2.   GENERAL, PHYSICAL, FUNCTIONAL INTERFACE, AND OPERATIONAL DESCRIPTION AND
OPERATIONS OF THE TORPEDO LAUNCHING SYSTEM**

DISCUSSION POINT   RELATED INSTRUCTOR ACTIVITY

  a. Startup/infrequent modes   a. Refer to SSM V6P3B3B, OI V6P3B3B, OI 631-12.
      of operation   Direct trainee to perform ECG-W1 Exercises.

  (1) Initial conditions

NOTE:

The RIA ties the Discussion
Point to be covered to a specific
procedure to be followed onboard
(approved operational procedure)
with the exercise being performed
in the Lab/Trainer

     (a) Recognize/interpret
          indications

  (2) Startup

     (a) Recognize/interpret
          indications

2CO1-1-2-1

TOPIC 2.   GENERAL, PHYSICAL, FUNCTIONAL INTERFACE, AND OPERATIONAL DESCRIPTION AND OPERATIONS OF THE TORPEDO LAUNCHING SYSTEM

DISCUSSION POINT   RELATED INSTRUCTOR ACTIVITY

    (a)   Recognize/interpret   (a)   Direct trainees to perform ECG-W1
         indications   Exercises.

  c.   Casualty

    (1)   Jettison   (1)   Refer to NAVSEA OD 44979, Vol. 4, OPs 3.5 9.2.
                                   and Direct trainees to perform ECG-W1
                                   Exercises.

    (a)   Recognize/inter-
         pret indications

2CO1-1-2-1

A-10-15

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TOPIC 2.   GENERAL, PHYSICAL, FUNCTIONAL INTERFACE, AND OPERATIONAL DESCRIPTION AND OPERATIONS OF THE TORPEDO LAUNCHING SYSTEM

DISCUSSION POINT   RELATED INSTRUCTOR ACTIVITY

13. Review and summary

14. Critique

2CO1-1-2-1

A-10-16

INSTRUCTOR GUIDE

MASTER MATERIAL LIST

Course: Defensive Weapons Ordnance Subsystem Replacement

Class Size: As per the Formal Schools Catalog

A.   TEXTS

Navy No.	Title	Per Man	Per Inst.	Per Cl.
A-123-0001	Torpedoman Training IG		1	
ECG-W1	Exercise Controller Guide ECG		1	

B. REFERENCES

Navy No.	Title	Per Man	Per Inst.	Per Cl.
NETCINST 5100.1	(NETCINST 5100.1 Title)		1	
COMSUBPACINST 4855.1	Quality Assurance Manual		1	1
COMSUBLANT/PACINST C8500.4	Convention Weapons Manual		1	
TTF-9112/TTF-8203	Instructor/Maintenance Handbook for Torpedo Tube Trainer Laboratory		1 of each	
MIP 7500 series MRCs	Torpedo Mk 48		1	1
CNTECHTRA - ST1, Vol. 39	Fault Insertion Guide - Torpedo Launching System		1	
NWP 72-1 (C)	Submarine Torpedo Reference Manual		1	

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MASTER MATERIAL LIST (Continued)

C GRAPHICS

Transparency No.	Title	Per Cl.	Sources	Figure No.
M203-1-3-3	Hydraulics	1	NAVSEA OP 4023	8-2
M203-1-3-4	Tube Exit	1	NAVSEA OP 4020	3-11
M203-1-3-5	Warhead Arming (C)	1	NAVSEA OP 4020	3-1
M203-1-3-6	Pre-enable run (C)	1	NAVSEA OP 4020	3-13
M203-1-3-7	MK 21 Safing Explorer Top	1	TTF Original	

    2.   Wall Charts

Wall Chart No.	Description	Per Cl.		Figure No.

None

D. SUPPORT MATERIALS

1. ECG-W1 Exercises. All instruction sheets (i.e., Problem Sheets, Information Sheets, etc.) are A-123-0001, series. (All instruction sheets for this course are contained within problem guide, A-123-0001).

PROFILE ITEM-TO-TOPIC OBJECTIVE ASSIGMENT CHART

TABLE	ITEM	TOS	VOL	PART	SECT		LRNG OBJ
2C01	1-1-1	T1		2C01	1	2	1
	1-1-2	T1			1	2	2
	1-1-3	T1			1	2	4
	1-1-3	T2			1	2	4
	1-1-4	T1			1	2	5
	1-1-4	T2			1	2	5
	1-1-5	T1			1	2	3
	1-2-1	T1			1	2	6
	1-2-1	T2			1	2	6
	1-2-2	T1			1	2	8
	1-2-2	T2			1	2	8
	1-3-1	T1			1	2	7
	1-3-1	T2			1	2	7
	1-3-2	T1			1	2	8
	1-3-2	T2			1	2	8
	1-4-1d	T1			1	2	9
	1-4-1d	T2			1	2	9
	1-4-1e	T1			1	2	9
	1-4-1e	T2			1	2	9
	1-4-2a	T1			1	2	9
	1-4-2a	T2			1	2	9
	1-4-2d	T1			1	2	9
	1-4-2d	T2			1	2	9
	1-4-2e	T1			1	2	9
	1-4-2e	T1			1	2	9
	1-4-2f	T1			1	2	9
	1-5-1	T1			1	2	10
	1-5-1	T2			1	2	10

TABLE	ITEM	TOS	VOL	PART	SECT	TOPIC	LRNG OBJ
2CO1 (Cont)	1-5-2	T1			1	2	11
	1-5-3	T1			1	2	12
	1-5-3	T2			1	2	12
	1-5-4	T2			1	2	13
	1-5-6	T1			1	2	10
	1-5-6	T2			1	2	10
	1-7-1	T1			1	1	1
	2-1-1	01			1	2	14
	2-1-2	01			1	2	15
	2-1-2	02			1	2	15
	2-1-3	02			1	2	16
	2-1-5	01			1	2	17
	2-1-5	02			1	2	17
2CO6	1-1-1	T1		2CO6	1	1	1
	1-1-2c	T1			1	1	2
	1-1-2d	T1			1	1	2
	1-1-2e	T1			1	1	2
	1-1-2f	T1			1	1	2
	1-1-3	T1			1	1	3
	1-1-3	T2			1	1	3
	1-1-4	T1			1	1	4
	1-1-4	T2			1	1	4
	1-1-5	T1			1	1	5
	1-2-1c	T1			1	1	2
	1-2-1c	T2			1	1	2
	1-2-1d	T1			1	1	2
	1-2-1d	T2			1	1	2
	1-2-1d	T1			1	1	2

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EXERCISE CONTROLLER GUIDE

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LIST OF EFFECTIVE PAGES

Page No.	Change in Effect	Page No.	Change in Effect	Page No.	Change in Effect	Page No.	Change in Effect
Title Page	Change 5	(1), (2)	Change 3				
ii	Change 5	(3) thru (6)	Change 5				
Letter of Promulgation	Original	(7)	Change 3				
iv thru vi	Change 3						
vii thru xii	Change 5						
1 thru 4	Change 3						
5, 6	Change 5						
7	Change 3						
8	Change 5						
W2CO2-1	Change 3						
W2C02-3	Change 5						
W2CO1-1	Change 3						
W2CO2-2	Change 3						

A-10-21

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HAZARD AWARENESS NOTICE

All personnel involved in operation or maintenance of electronic equipment must be thoroughly familiar with the electronic equipment safety precautions contained in Electronic Installation and Maintenance Book NAVSEA 0967-LP-000-0100, Section 3, and NSTM, Electronics, Chapter 400, NAVSEA S9086-ND-STM-000/CH 400, Section 2. In addition, attention is directed to the Accident Prevention Manual, OPNAVINST 5101.2 (series), and Safety procedures for Conducting training in arduous or potentially high-risk activities, NETC 5100.1 (series).

This equipment employs voltages which are dangerous and may be fatal if contacted by operating or maintenance personnel. Extreme caution must be exercised when working with this equipment. Hazard awareness dictates that this equipment must always be viewed as integral part of a system and not as a component. While every practical precaution has been incorporated into this equipment, it is not possible or practical to try to list every condition or hazard that you may encounter. Therefore, all operating or maintenance personnel must at all times observe as a minimum, the following:

DON'T SERVICE OR ADJUST ALONE

Under no circumstances will a person operate or maintain equipment without the immediate presence or assistance of another person capable of rendering aid. Unless under direct supervision of a qualified person, no person shall operate or maintain equipment for which he is not qualified.

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HAZARD AWARENESS NOTICE (Continued)

DON'T TAMPER WITH INTERLOCKS

Reliance on interlock circuits to remove power from the equipment is never to be assumed. Until operation of the interlock is verified, equipment is assumed to be in the hazardous mode of operation. Under no circumstances will any access gate, door, or interlock switch be removed, bypassed, or modified in any way by other than authorized maintenance personnel and then only after observing proper tag-out procedures.

REPORT ALL HAZARDS

If at any time you detect a hazard, it is your responsibility to report the hazard to ensure that it is corrected. If at any time you detect a "new" or "suspected new" hazard, particularly due to equipment installation modification or repair, it is your responsibility to ensure that a SAFETYGRAM is submitted to the Naval Safety Center, Norfolk, VA, in accordance with OPNAVINST 5102.1 (series). This will ensure that this hazard will be investigated, publicized, or corrected as required.

SAFETY SUMMARY

The following paragraphs summarize, for the benefit of the Weapons Department and qualified launcher personnel, the safety rules and general safety precautions for the operation of pyrotechnics, countermeasures, evasion devices, and their launcher systems. Familiarity with and adherence to the applicable safety rules and safety precautions are mandatory for all personnel involved in the operation and maintenance of the system. Specific safety precautions are contained in the checklists and operating procedures, as appropriate.

HAZARD AWARENESS NOTICE (Continued)

1. SAFETY STANDARDS

    The following safety standards apply to all phases of operations involving the devices and their launcher systems. The controls and rules are designed to provide positive measures to:

    a. Ensure that a launched device is precluded from striking the firing ship.

    b. Prevent an inadvertent/accidental launching.

    c. Ensure the disposition, handling, launching, and aborting operations of the device launcher system will be such as to minimize the risk of injury to personnel and or equipment.

2. MK 48 SAFETY PRECAUTIONS

    a. Explosive Precautions

        (1) These units contain high explosives. Do not strike or drop high explosive components. No sparks, open flames, or other sources of ignition are to be present when working with high explosives.

        (2) The arming device contains an explosive charge and must be handled with care. The explosive charge is relatively insensitive, but the arming device should not be subjected to physical shocks or unnecessary handling.

        (3) The warhead contains high explosives. Observe all precautions for handling explosives. An armed exploder must NOT be removed from the torpedo. If the exploder is armed, it must be removed by EOD personnel only. (Refer to NWP-72-1.)

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HAZARD AWARENESS NOTICE (Continued)

(4) If the exploder tube feeler index is not in the SAFE position and flush with the exploder head, rotate the Manual Safety Switch to the RECOVER position and notify EOD personnel.

(5) A safety screw can be installed in the exploder only if the tube feeler is in the SAFE position. If the safety screw is not available or cannot be installed, reject the exploder.

b. OTTO FUEL PRECAUTIONS

(1) For any OTTO fuel detector reading in excess of 0.2 ppm, OTTO fuel spill procedures must be implemented.

(2) Food, drink, and tobacco are not permitted in OTTO fuel spill areas.

(3) Organic cartridge respirators or oxygen breathing apparatus are not to be used in combating OTTO fuel-associated casualties, including cleanup of spills or combustion by-products.

(4) A minimum of two people will be present during operations involving OTTO fuel.

(5) OTTO fuel, a monopropellant, has a flash point of 265 degree F and does not require oxygen to sustain ignition.

(6) (MK 48) Exhaust gases from a HOT RUN MK 48 are extremely toxic and constitute personnel hazards by inhalation, ingestion, and skin absorption.

c. ADDITIONAL MK 48 SAFETY PRECAUTIONS

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EXERCISE CONTROL GUIDE

HAZARD AWARENESS NOTICE (Continued)

(1) Mechanical Precautions. To preclude the possibility of the torpedo engine lubricating oil draining out of the sump, the MK 48 torpedo shall not be rotated in excess of 90 degrees, except for defueling.

(2) Operating Precautions. Under no circumstances will fire control transmission checks be conducted on a MK 48 torpedo outside the torpedo tube.

3. HANDLING PRECAUTIONS

a. Handling equipment shall never be loaded to its maximum rated capacity and must be inspected prior to use.

b. Hooks used in handling procedures must have safety latches or be moused.

c. Do not allow weapon to be unrestrained, in any direction, at any time.

d. At no time will a device be unloaded through the breech without specific permission of the commanding officer.

4. ELECTRICAL PRECAUTIONS

a. Personnel must be grounded immediately prior to touching an electrical connector or wire connected to the weapon. Personnel must momentarily ground themselves by making bare skin-to-metal contact with the weapon.

A-10-26

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HAZARD AWARENESS NOTICE (Continued)

b.   Personnel working with or near high voltages should be familiar with the methods of artificial respiration.

c.   Inspect all electrical connectors for bent pins and other physical damages. Always engage and disengage electrical connectors by holding the connector, never the wire.

d.   Operating personnel observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high-voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the OFF position, due to charges retained by capacitors. To avoid casualties, always remove power and discharge and ground a circuit before touching it.

e.   Under no circumstances should any person reach into or enter the enclosure for the purpose of servicing or adjusting the equipment, except in the presence of someone who is capable of rendering aid.

5.   HIGH PRESSURE AIR PRECAUTIONS

a.   Pressurized air leaks produce a jet of high velocity air, which normally cannot be seen. Care must be taken to avoid the path of one of these jets. Exposing any part of the body to high velocity air can cause serious bodily injury.

b.   Do not stand in the way of relief valve or bleed discharge ports. Exposing any part of the body to high velocity air can cause serious bodily injury.

HAZARD AWARENESS NOTICE (Continued)

c. Open all HP air valves slowly whenever the differential pressure across the valve exceeds 200 psig. Avoid a pressurization rate in excess of 200 psig per minute to prevent the possibility of compression ignition or a shock wave that could rapture a pipe or fitting.

6. TOXIC MATERIAL PRECAUTIONS

a. Vapors of most cleaning agents are toxic if inhaled in large quantities for extended periods. Use toxic cleaning agents sparingly and in well-ventilated areas. Be sure that cleaning agent containers are kept closed, except when actually in use. Wash hands thoroughly with soap and warm water after using cleaning agents.

b. Use flammable cleaning agents and paints sparingly and only in well-ventilated areas. Be sure no sparks, open flames, or other source of ignition are present when materials, which are flammable, are being used.

7. GENERAL GUIDANCE. Use of personnel listed in personnel tables is not required, unless so indicated. The combined tasks of Supervisor, Reader, Tool Handler, and Workers may be performed by a minimum of two personnel, providing procedures are performed properly and the Reader/Worker Routine will be enforced when applicable. Upon completion of an evolution, complete work-log/form entries as required by the Type Commander.

8. WARNINGS. The following WARNINGS are repeated from the technical documentation for protection of personnel.

EXERCISE CONTROL GUIDE

HAZARD AWARENESS NOTICE (Continued)

_____
WARNING

ALL HOOKS WITHOUT SAFETY LATCHES MUST BE MOUSED.

_____
WARNING

WEAPON MUST BE RESTRAINED AT ALL TIMES.

_____
WARNING

VERIFY OTTO FUEL DETECTOR IS RUNNING FOR THIS OP (OP1.20)

_____
WARNING

THE MK 15 OTTO FUEL DETECTOR SHALL OPERATE CONTINUOUSLY DURING ALL MK 48
TORPEDO HANDLING EVOLUTIONS.

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EXERCISE CONTROL GUIDE

HAZARD AWARENESS NOTICE (Continued)

_____
WARNING

IF THE PRESENCE OF OTTO FUEL IS DETECTED, DISCONTINUE EVOLUTION.

_____
WARNING

WHEN OPERATING RAMMER, VERIFY ALL PERSONNEL ARE CLEAR OF AREA AND ARE AWARE RAMMER IS IN MOTION.

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FOR TRAINING USE ONLY

INTRODUCTION

1.   INTRODUCTION TO TRAINING SYSTEM

1-1 THE FUNCTIONAL OBJECTIVE OF THE TORPEDOMAN

   Team Trainer is to provide refresher training in Normal, and Casualty Operations, During Battlestations Torpedo and Battlestations Missile.

   The purpose of this training is to refine and integrate individual Team Member performance into a concerted performance. This is accomplished by emphasizing previously acquired individual Skills/ Knowledge, interteam communication. Recognition of Emergency situations that threaten the ships ability to defend itself.

1-2 TRAINING SYSTEM DISCUSSION

   The Training System for the Torpedoman Team Trainer consists of (1) Torpedo Tube Lab, (2) MK 48s, MK 70 Moss System, IG, PG, and ECG. The following paragraphs describe capabilities and limitations of the Torpedo Tube Lab. Summarizes ECG composition, organization, use, maintenance, and describes associated training matter duties.

1-2.1   TORPEDO TUBE LAB

   The purpose of the Torpedo Tube trainer is to provide a simulated Torpedo environment in which Battlestations can be conducted.

   Intended use is to refresh Reload Party and Torpedoman on procedures and working as a team. Recognition of Casualties, Communications, and decision making.

1-2.2   DISCUSSION

   To achieve optimum training and evaluation of the Torpedomen and Reload Party. The training simulates actual operation and equipment necessary in developing, and refining Reload in torpedo tube casualty skills.

   The Trainer consists of the following Major Areas:

   a.   Torpedo Tube
   b.   Handling Platform
   c.   Classroom

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FOR TRAINING USE ONLY

INTRODUCTION (CONTINUED)

1-2.2 (con't)

The Instructor Panel in the training area enables the Instructor to control problem fault modules and monitor operations.

2. EXERCISE SECTION

2-1 BACKGROUND

This section presents a procedure for selection of Training Exercise contained in this volume. the Exercise Selection Index provides a matrix of training considerations within a specific Exercise.

2.2 DISCUSSION

The details regarding the specific procedures for Exercise Selection are as follows:

2-2.1   EXERCISE SELECTION BY INDEX

Exercise Selection utilizing the Index is the method for selecting the exercise for a training session. With the Index criteria presented, specific Indexing criteria follow with a brief explanation of each Indexing criterion:

a. The exercise Objective specifies the detailed purpose of the particular Exercise with regards to the Torpedo Team Trainer proficiency.

b. The Exercise Scenario column provides synopsis of conditions under which the Exercise is to be performed.

c. The System/Subsystem configuration column specifies the equipment line-up readiness condition or mode of operation required to conduct the exercise.

d. Exercise Length is a guideline only, safety procedures are of utmost concern and Exercise Length is variable.

e. The Training Level (TOS) column specifies the TOS for each Exercise.

f. The Difficulty Index indicates the degree of exercise difficulty relative to the appropriate TOS. It is helpful in selecting exercises appropriate to the proficiency of the Torpedo Room Team Members.

INTRODUCTION (CONTINUED)

3.   LOCALLY PREPARED EXERCISE

3-1   BACKGROUND

    This section presents procedures for local development of the training exercises. This volume provides a cross section of training exercises ready for immediate use within the Training Plan. Optimal use of training system may result in the need for additional materials beyond the limit number of training exercises provided. A portion of this need can be resolved through local training exercise development. This will accomplish two functions: tailor exercises to specific training requirements, and increase the initial exercise library.

3-2   DISCUSSION

    Locally prepared exercise should make a significant contribution to the effectiveness of the Torpedo Team training and extend the versatility of the training system. Exercise must be carefully developed by using an organized approach based on a structure to achieve training. The exercise presented involves extensive developmental and background efforts.

The component parts with exercises are:

a.   Exercise objectives.
b.   Set-up Requirements.
c.   Exercise Scenario and Tactical Background.
d.   Exercise Events.

    An overall consideration which determines these components are used with an exercise, and where training should be emphasized, is the training approach. This relationship between the training approach and the component parts of an exercise will be defined in the paragraph following. For uniformity, it is highly recommended that the format of exercises in this ECG be used for locally prepared exercises.

3-3   EXERCISE DEVELOPMENT

    The following guidelines for specific exercises development explain the training approach concept and its role in developing the components within the exercise.

FOR TRAINING USE ONLY

INTRODUCTION (CONTINUED)

3-3 (con't)

    For each exercise, a training approach must be defined which tells the Instructor exactly how he will administer the exercise. The exercise objective must be determined coincident with the selection of a training approach. The exercise objective defines the well as the object of the training. Exactly what training as to be accomplished must be defined. It is not advisable to include other training aspects within the same training, but to concentrate the objective to the need.

3-3.1   EXERCISE SET-UP

    Once the training approach and the exercise objective have been defined, the actual exercise set-up must be developed. this includes such consideration as:

    a.   Exercise length - Expected time to accomplish the objective
    b.   Own ship limitations
    c.   Student expertise

3-3.2   EXERCISE SCENARIO

    The tactical situation and environment provides the setting in which the training will occur, and must complement the exercise objective. In establishing the exercise environment, it must be kept in mind how the actual external environment (depth, Speed, Trim) is expected to affect the training, and what limits should be established for this.

    Exercise Scenario should include:

    a.   Assumed OpArea or location.

    b.   Assumed ship operation or evolution

3-3.3   EXERCISE EVENTS

    The exercise events are the logical step-by-step method by which the exercise presents the training problem to the operators. They include:

    a.   Precomex events which are normally for briefing the operators on the assumed tactical situation versus the training problem, setting up equipment and trainer inputs, and performing items such as placing damage control gear in the trainer.

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INTRODUCTION (CONTINUED)

3-3.3 (con't)

b.   Comex is a point in the exercise at which the trainer function is started and target injection occurs.

c.   Training Events are the principal events required to accomplish the intended training. The specific number of events is based on the requirements of the objectives.

d.   Finex is when the trainer is secured, and no further exercises occur.

e.   Review occurs upon completion of the training section. The specifics of this review are a function of the Training approach for the particular exercise.

Generally, the instructor may review what training was considered important, how it was or was not achieved, and the approach to correct less-then-effective areas of operation. A question and answer period may also occur at this time.

3-3.4 EXERCISE SUBMITTAL

When developing exercises specific to individual training devices, include trainer type in requirements section of the Exercise Title Sheet. submit proposed Exercise to Course Curriculum model Manager for approval and issue of Interim Change to incorporate. All Interim Changes will be included in the next Change or Revision.

4.   OPERATIONAL TRAINER SAFETY INSTRUCTIONS

4-1 SAFETY DISCUSSION

Safety is the utmost importance in the operation of the training device. Trainees are encouraged to work quickly, but carefully in the trainer to avoid injuries, all trainees will be briefed on trainer safety precautions prior to the training session.

4-1.1   TRAINER SAFETY GUIDELINES

Trainer safety is of the utmost importance, and as such, the following requirements will be adhearded to.

INTRODUCTION (CONTINUED)

4-1.1 (con't)

a. All personnel involved in the operation of the trainer will complete the following.

    (1) Know the location of the first aid equipment.

    (2) Complete the basic first aid course.

    (3) Be qualified to perform cardiopulmonary recitation.

b. All operators will complete a qualification program for the trainer operation.

c. A minimum of one operator will be present for all training sessions.

d. All students attending the 5 day trainer session will complete the course in its entirety.

e. Prior to students training, an orientation brief and walk-through of the trainer will be conducted by the instructor and cover at a minimum, the following:

    (1) Drop On Request (DOR)

    (2) Training Time Out (TTO)

    (3) Location of all first aid equipment.

    (4) Casualty plan for injured.

    (5) Location of communication equipment.

    (6) Location and responsibility of supervisor, operators safety observers.

    (7) All safety precautions associated with the handling of hazardous materials.

f. All students will wear steal-toe shoes during the trainer section.

g. Operators review system line-up checks for all normal and emergency systems necessary to support safe training.

h. Operators review prior to each training section, all actions required in the event of personnel casualty, to include first aid, notification of appropriate supervisors, and personal evacuation methods and routes.

INTRODUCTION (CONTINUED)

i. At the minimum, whenever any of the following
conditions exsist, the operator and/or safety
observer will terminate the training section
until the unsafe conditions are corrected.

EXERCISE SELECTION GUIDE						
EXERCISE NUMBER	EXERCISE OBJECTIVES	EXERCISE SCENARIO	SYS/SUB CONFIG.	EXERCISE LENG.(MIN)	TRAIN. LEV.(TOS)	DIFFICULTY INDEX
W2C02-1	PROVIDE TRAINING IN CASUALTY PROCEDURES DURING BATTLESTATION TORPEDO ON MK 48 TORPEDO.	OTTO FUEL LEAK FROM MK 48	N/A	VARIABLE 120 MINS. MAX.	O2	INTERMEDIATE
W2C02-3	PROVIDE TRAINING IN MK-48 HOT RUN CASUALTIES OPERATIONS.	START AT BATTLESTATIONS MISSILE PROCEDURES		VARIABLE 120 MINS. MAX.	O2	AVERAGE
W2CO1-1	PROVIDE TRAINING IN TORPEDO TUBE LOADING	START AT BATTLESTATION MISSILE	N/A	VARIABLE 120 MINS. MAX.	O2	AVERAGE
W2CO2-2	PROVIDE TRAINING IN TORPEDO A-CABLE REPLACEMENT.	LARGE WARSHIP CLOSING FIRING POINT PROCEDURES.	N/A	VARIABLE 120 MINS. MAX.	C1	AVERAGE

8.

EXERCISE TITLE SHEET

EXERCISE NO. W2CO1-1	TITLE: TORPEDO TUBE OPERATIONS	Sheet 1 of 3
OBJECTIVE: TO PROVIDE TORPEDO ROOM TRAINING ON TORPEDO TUBES AND HANDLING		EXERCISE LENGTH: (MIN) 60 MIN
		TRAINING LEVEL (TOS) 02
		DIFFICULTY INDEX AVERAGE

REQUIREMENTS:	APPROACH:

1. EQUIPMENT
   a. TORPEDO LAB
   b. Mk 48 w/s
   c. MANUAL HANDLING EQUIPMENT
	TO PROVIDE HANDS ON TORPEDO TUBE AND MANUAL HANDLING PROCEDURES

	SPECIAL INSTRUCTIONS: MONITOR SAFETY DURING MANUAL LOADING PROCEDURES. SPECIAL ATTENTION SMOOTHNESS OF GRIP HOIST OPERATIONS.

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EXERCISE TITLE SHEET

EXERCISE NO. W2C01-1	TITLE: TORPEDO TUBE OPERATIONS		Sheet 2 of 3
TIME	EVENT	CONTROLLER ACTIVITY	OPERATOR ACTIVITY
PRECOMEX	1. TORPEDO LAB SET-UP	1. TORPEDO TUBE LAB READY FOR OPERATION AS PER OPERATING INSTRUCTIONS.	1. READ SAFETY SUMMARY
PRECOMEX	2. SCENERIO BACKGROUND	2. BRIEF TEAM SHIP AT ALERT BATTLESTATION MISSLE . TONALS IN THE WATER.	2. TEAM IN THE CLASSROOM
PERCOMEX	3. SCENERIO SET-UP	3. TMD IN TORPEDO TUBE # 1. TT# 1 AND 2 READY IN ALL RESPECTS. STATION UNDER-WAY WATCH 1,2,OR 3.	3. TMOW MANNED ALL BOOKS IN LAB AND TOOLS SET-UP FOR UNDERWAY.
T+0	4. BATTLESTATIONS MISSLE	4. MAN BATTLESTATION MISSLE. TONALS IN THE WATER.	4. TORPEDO RELOAD PARTY STANDING BY. TT# 1 AND 2 READY.
T+5	5. FIRING POINT PRECEDURES	5. WARM UP POWER FIRING POINT PRECEDURES	5. TORPEDO ROOM READY
T+10	6. LAUNCH TT# 2	6. LAUNCH TT# 2. TORPEDO IN THE WATER.	6. ROOM SUPERIVISOR: DIRECTS RIGGING OF THE TORPEDO ROOM.
T+15	7. TORPEDO IMPACT	7. TORPEDO IMPACT. LOSS OF HYD. LAUNCH TT# 1 (SECURE HYD. SUPPLY AS PER VALVE LINE-UP INSTRUCTION.	7. ROOM SUPERIVISOR ACTIONS RECOGN-OF LOSS OF HYDS. AND RECOMMENDA-TIONS.

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EXERCISE TITLE SHEET

EXERCISE NO. W2C01-1	TITLE: TORPEDO TUBE OPERATIONS		Sheet 3 of 3
TIME	EVENT	CONTROLLER ACTIVITY	OPERATOR ACTIVITY
T+20	8. RELOAD	8. RELOAD TT# 1.	8. TORPEDO RELOADS ABILITY TO RELOAD WITHOUT HYDS.
T+25	9. DISTANT EXPLOSION	9. DISTANT EXPLOSION HULL BREAK-UP.	9. NO ACTION.
FINEX	10. FINEX	10. UPON COMPLETION OF MANUAL TUBE LOADING. SECURE SCENERIO RESTOW ROOM AND CRITIQUE SCENERIO.	10. RELOAD PARTY RESTOW TORPEDO LAB.

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EXERCISE TITLE SHEET

EXERCISE NO. W2CO2-1	TITLE: MK 48 CASUALTY OPERATIONS	Sheet 1 of 4
OBJECTIVE: TO PROVIDE TRAINING IN RECOGNITION OF MK 48 OTTO FUEL SPILL AND CLEAN-UP PROCEDURES		EXERCISE LENGTH: (MIN) 60 MIN
		TRAINING LEVEL (TOS) 02
		DIFFICULTY INDEX INTERMEDIATE

REQUIREMENTS:
 	
1. EQUIPMENT
 	
  a. TORPEDO TUBE LAB
  b. Mk 48 EXERCISE (OTTO FUEL SPILL TRAINER)
	APPROACH:
	
	PROVIDE STUDENTS WITH BATTLESTATION PROCEDURES, VARIOUS TORPEDO TUBE AND HANDLING EVOLUTIONS. TO CONCLUDE WITH OTTO FUEL II SPILL.

	SPECIAL INSTRUCTIONS: Monitor phone communications to control, and Face To Face communications. Concentrate on Procedurel Compliance/Familiarity.

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EXERCISE TITLE SHEET

EXERCISE NO. W2C02-1	TITLE: MK 48 CASUALTY OPERATIONS	Sheet 2 of 4
TIME	**EVENT**	**CONTROLLER ACTIVITY**	**OPERATOR ACTIVITY**

TIME	EVENT	CONTROLLER ACTIVITY	OPERATOR ACTIVITY
PRECOMEX	1. TORPEDO TUBE LAB SET-UP	1. TORPEDO TUBE LAB READY FOR OPERATION AS PER OPERATING PROCEDURES.	1. READ SAFETY SUMMARY
PRECOMEX	2. SCENARIO BACKGROUND	2. BRIEF TORPEDOMEN AND RELOAD PARTY SHIP IS ON ALERT RIGGED FOR ULTRA QUIET. TONALS IN THE WATER.	2. TEAM WILL BE IN THE CLASSROOM.
PERCOMEX	3. SCENARIO SET-UP	3. a. LOAD TMD IN THE TORPEDO TUBE #1 AS PER OD44979 VOL 7. b. SELECT 1,2,OR 3 UNDERWAY TORPEDO RM WATCH TO BE MANNED. c. SUPPLY TMOW WITH INFORMATION FOR TORPEDO ROOM STATUSBOARD.	3. TMOW MANNED AND UP-DATE STATUS-BOARD. SET-UP LAB TO SHIP.

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EXERCISE TITLE SHEET

EXERCISE NO. W2C02-1	TITLE: MK 48 CASUALTY OPERATION		Sheet 3 of 4
TIME	EVENT	CONTROLLER ACTIVITY	OPERATOR ACTIVITY
T+0	4. COMEX	4. START EXERCISE AS FOLLOWS: PASS OVER PHONE RIG SHIP FOR ULTRA QUIET, TONALS IN THE WATER.	4. TMOW RIG FOR ULTRA QUIET AND MAKE REPORT.
T+5	5. BATTLESTATIONS	5. TORPEDO IN WATER, SNAPSHOT TT# 1. MONITOR TMOW ACTIONS FOR TUBE OPER-ATIONS.	5. TMOW PREPARE TORPEDO TUBE GIVE PROPER TURNOVER TO BATTLESTATION SUPERVISOR.
T+10	6. POSTLAUNCH	6. POSTLAUNCH TT# 1, RELOAD TT# 1 WITH MK 48 TORPEDO. MONITOR POSTLAUNCH PROCEDURES.	6. STBD. TORPEDO RELOAD PARTY POST-LAUNCH AND RELOAD TT#1.

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EXERCISE TITLE SHEET

EXERCISE NO. W2C02-1	TITLE: MK 48 CASUALTY OPERATION		Sheet 4 of 4
TIME	EVENT	CONTROLLER ACTIVITY	OPERATOR ACTIVITY
T+15	7. OTTO FUEL SPILL	7. PASS THE WORD TORPEDO IMPACT, FLOODING IN THE ENGINE RM. a. AT THIS TIME SELECT A SPILL AREA FROM THE MK 48 OTTO FUEL SPILL TRAINER, GIVE COMMAND TO RELOAD TT# 1. CONDUCT OTTO FUEL SPILL DRILL.	7. OBSERVE SUPERVISOR ABILITY TO RUN CASUALTY AND CONTINUE TUBE LOADING PROCEDURES. a. OBSERVE RELOAD PARTY PORT IDENTIFIES PROPER LEAK POINTS, MAJOR OR MINOR SPILL AND OTTO FUEL SPILL PROCED- URES AND IMMEDIATE ACTIONS.
	8. OTTO FUEL SPILL CONTAINMENT AND FINAL CLEAN-UP DECONTAMINATION	8. UPON FINAL CLEAN-UP AND DECON TERMINATE THE DRILL.	8. CLEAN-UP TEAM DIDN'T CONTAMINATE THE REST OF THE BOAT CONTINUED RELOAD TT# 1.
	9. RESTOW	9. DIRECT TRAINEE TO RESTOW LAB AND HANDLING EQUIPMENT, OTTO FUEL SPILL BAG.	9. TRAINEE RESTOW LAB
	10. FINEX	10. FINEX a. BATTLESTATION SUPERVISOR CRITIQUE OVERALL EVALUATION.	10. FINEX- TEAM LEAVES TRAINER AND GOES INTO CLASSROOM FOR CRITIQUE.

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PERSONNEL PERFORMANCE PROFILE BASED
CURRICULUM DEVELOPMENT MANUAL
VOLUME III MANAGER'S GUIDE

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NAVEDTRA 131B

PERSONNEL PERFORMANCE PROFILE BASED CURRICULUM DEVELOPMENT MANUAL VOLUME III

MANAGER'S GUIDE

TABLE OF CONTENTS

ADDENDUM

LIST of ACRONYMS

AAC	Acquisition Advice Code
AG/SAG	Activity Group/Sub-Activity Group
AIM	Authoring Instructional Materials
AIM I	PPP Based Authoring Tool (Legacy)
AIM II	Task Based Authoring Tool (Legacy)
AOB	Average On Board
ASVAB	Armed Services Vocational Aptitude Battery
BCA	Business Case Analysis
CAGE	Commercial and Government Entity Code
CAIMS	Conventional Ammunition Integrated Management System
CANTRAC	Catalog of Navy Training Courses
CARIS	CNETC Automated Resource Information System
CBT	Computer Based Training
CCA	Curriculum Control Authority
CCMM	Course Curriculum Model Manager
CDA	Curriculum Developer Aid
CDP	Course Data Processing
CeTARS	Corporate enterprise Training Activity Resource System
CIN	Course Identification Number
CLO	Course Learning Objective
CM	Corrective Maintenance
CMS	Course Master Schedule
CNP	Chief of Naval Personnel
CO	Commanding Officer
COI	Curriculum Outline of Instruction
COG/NIIN/SMIC	Cognizance Code/National Item Identification Number/Special Material Identification Code
CPM	Content Planning Module
CTTL	Course Training Task List
DDA	Discussion-Demonstration Activity
DOD	Department of Defense
DOR	Drop On Request
DP	Discussion Point
DSOT	Daily System Operating Test
EO	Enabling Objective
FAL	Fault Applicability List
FC	Functional Commander
FEA	Front End Analysis
HPRR	Human Performance Requirements Review
ICW	Interactive Courseware
IETM	Interactive Electronic Technical Manual
IG	Instructor Guide
ILE	Integrated Learning Environment
IMI	Interactive Multimedia Instruction
IMM	Instructional Media Material

IPR	In Process Review
ISD	Instructional Systems Design
ITRO	Interservice Training Review Organization
JDTA	Job Duty Task Analysis
JTI	Job Task Inventory
KM	Knowledge Management
LC	Learning Center
LCMS	Learning Content Management System
LMS	Learning Management System
LO	Learning Objective
LOM	Learning Object Module
LP	Lesson Plan
LS	Learning Site
LSAR	Logistics Support Activity Record
LSO	Learning Standards Officer
LT	Lesson Topic
MCRF	Master Course Reference File
MILCON	Military Contract
MIL-STDS	Military Standards
NALC	Navy Ammunition Logistics Code
NCMR	Navy Curriculum Materials Repository
NEC	Navy Enlisted Classification
NETC	Naval Education and Training Command
NITRAS	Navy Integrated Training Resources Administration System
NKO	Navy Knowledge Online
NMETLS	Navy Mission Essential Task Lists
NOBC	Navy Officer Billet Classification
NPC	Navy Personnel Command
NTFS	Navy Training Feedback System
NTSP	Navy Training Systems Plan
OAC	Item-to-Objective Assignment Chart
O&MN	Operation and Maintenance Navy
OCCSTD	Occupational Standards
OJT	On-The-Job Training
PADDIE	Plan, Analyze, Design, Develop, Implement and Evaluate
PM	Preventive Maintenance
POA&M	Plan of Action and Milestones
POM	Program Objective Memorandum
PPP	Personnel Performance Profile
PQS	Personnel Qualification Standard
RIA	Related Instructor Activity
RIT	Revolution in Training
RRL	Resource Requirements Listing
SCORM	Shareable Content Reference Model
SME	Subject Matter Expert

SYSCOM	Systems Command
TA	Training Agency
TAM	Table Assignment Matrix
TCCD	Training Course Control Document
TD	Training Device
TDSR	Training Decision Summary Report
TG	Trainee Guide
TLA	Training Level Assignment
TLO	Terminal Learning Objective
TO	Terminal Objective
TOS	Training Objective Statement
TPC	Training Path Chart
TPP	Training Project Plan
TPS	Training Path System Plan
TRR	Training Requirements Review
TSA	Training Support Agency
TTE	Technical Training Equipment
TTO	Training Time Out
TYCOM	Type Commander
VI	Visual Information
WC	Wall Charts

INTRODUCTION

CHAPTER 1

TRAINING MATERIALS DEVELOPMENT
INTRODUCTION

INTRODUCTION

The core procedures for developing training materials following the Personnel Performance Profile (PPP) Based Curriculum Development method consists of five interrelated Stages. The five stages are preceded by planning, and followed by training materials evaluation, surveillance, and modification. A curriculum development project is a complex under taking bringing together a wide range of human and material resources for the goal of creating quality training.

- *PLANNING* identifies resources requirement and the sequence of events in the development process.
- *STAGE ONE* consists of determining job tasks, supporting skills and knowledge, and level of performance.
- *STAGE TWO* determines the skills and knowledge which must be taught and produces the course learning objectives and an instructional sequence.
- *STAGE THREE* produces the instructional materials for the instructor and the trainee.
- *STAGE FOUR* begins when the Curriculum Control Authority (CCA) has approved a course for pilot, and ends with submittal of the Pilot Course Monitoring Report.
- *STAGE FIVE* begins after the incorporation of the results of the pilot course ("red-line") into smooth curriculum and management materials, and ends with the CCA Letter of Promulgation which approves the material for use in support of Navy training.
- *EVALUATION* is the surveillance, evaluation, change, and revision of the training materials based on assessment of the training materials and the performance of the graduates in the fleet.

NAVEDTRA 131 (SERIES): PPP Based Curriculum Development is designed to guide Navy activity personnel (curriculum developers) in the development of accurate and effective training materials. This manual:

- Specifies the tasks necessary to develop and support training materials.
- Establishes the sequence of task performance.
- Assigns task performance responsibilities.

The overall process is illustrated in Figure 1-1.

NOTE

Since the initial writing of this guidance, naval training has evolved to include a variety of different training solutions that were not available in the past such as Computer Based Training (CBT), Blended Training, and the Integrated Learning Environment (ILE), just to name a few. Although this volume focus on PPP Based Curriculum Development, the foundational principles explained in this volume such as the development of test items, the piloting process, and the planning and development of a training project plan, can and should be utilized with the evolution of new training solutions.

PLANNING - CCA/Functional Commander/NETC/OPNAV
- Training Project Plan (TPP)

STAGE ONE
- PPP Table List
- New and Modified PPP Tables
- Training Path System (TPS)

STAGE TWO - CCA
- Preliminary Training Course Control Document (TCCD)

STAGE THREE
- Instructional Materials Cross Section (if required)
- Lesson Plan
- Trainee Guide
- Tests
- Other Support Materials

STAGE FOUR - CCA
- Course Pilot
- Pilot Course Monitoring Report

STAGE FIVE
- Final Curriculum
- Final TCCD
- Letter of Promulgation

EVALUATION
- Internal
- External   = Approval Authority]

FIGURE 1-1: CURRICULUM DEVELOPMENT PROCESS

SECTION 1 - TRAINING MATERIALS

   Training materials include management materials, curriculum materials, and support materials. These training materials are developed following the guidelines of this manual.

> Recognizing the complexity of training materials development and the external factors which influence curriculum development projects, this manual is to be used as a guideline, not as a prescriptive document. Waiver of any document or procedure is at the discretion of the CCA. The CCA may also require additional documents or reviews.

AUTHORING INSTRUCTIONAL MATERIALS (AIM)

AIM is a computer based training materials authoring tool developed by the Navy. Training materials developed using AIM may be different in appearance than examples shown in this manual. However, all training materials developed using AIM are compatible with the concepts of this manual and are deemed to be correctly formatted. NETC LCs, or as designated, shall use AIM II (application) for the Plan, Analyze, and Design Phases of curriculum development. The develop phase may also be used if applicable and achievable. AIM I is for PPP Based Development and AIM II is for Task Based development which is discussed in detail in NAVEDTRA 130 (series).

1.1. **Management Materials.** Management materials define training requirements and provide an overall plan for the accomplishment of these requirements. The chapters of this manual provide detailed content requirements and format conventions for the development of management materials. Management materials for training materials development include:

- TPP – Discussed in Chapter 2
- PPP Tables – Discussed in Chapter 3
- TPS – Discussed in Chapter 4
- TCCD – Discussed in Chapter 5
- Pilot Course Monitoring Report – Discussed in Chapter 7
- Testing Plan – Discussed in Chapter 8 and NAVEDTRA 135 (series)

- Audit Trail Documentation – Discussed in NAVEDTRA 135 (series)

1.2. **Curriculum Materials.** Curriculum materials include all materials required for the presentation of information and the development of skills in formal school training. Chapters in this manual contain detailed content requirements, format conventions, and development guidelines for curriculum materials. Under this definition, curriculum materials include:

- Curriculum and Support Materials – Discussed in Chapter 6.
- Implement Final Curriculum – Discussed in Chapter 8.
- Test Package – Discussed in Chapter 8 and in NAVEDTRA 135 (series).
- Other Materials helpful in the preparation and presentation of Lesson Topics (e.g., Exercise Controller Guide).

1.3. **Support Materials**. Support materials are instructional materials and other devices used in support of formal instruction, informal instruction, or for independent study. Chapter 6 of this manual provides more detail on Visual Information (VI) and Instructional Media Materials (IMM). The following are the most common support materials:

- VI includes:
  - Wall Charts (WC)
  - Films
  - Digital Video Disc
  - Graphic Media Presentations

- IMM includes:

  - On-the-Job Training (OJT) Handbook.

- Textbooks:

  - Technical Manuals to include Interactive Electronic Technical Manuals (IETM)
  - Training Devices
  - Other materials helpful in the preparation and presentation of Lesson Topics, such as a Fault Insertion Guide, or Instructor Utilization Handbook

Development of professional-looking, instructionally
effective VI materials is costly and time consuming.
NETC has been criticized for failure to properly manage
VI production to reduce duplication of effort.
Therefore, VI materials of greater complexity than what
can be produced by in-house developers must adhere to the
requirements of NETCINST 3104.1 (series) and its
supporting instructions. Use your initiative and
imagination to identify and select appropriate VI
materials; leave production to the professionals. "Free
lance" VI production is definitely discouraged and may be
contrary to regulations.

SECTION 2 - TRAINING MATERIALS SUPPORT

All training materials are maintained current and accurate by
surveillance and change efforts.

2.1. Surveillance. Constant surveillance is required to detect
changes in documentation, equipment, or procedures that impact
training materials. Procedures for identifying training
material deficiencies, for recommending changes, and for
coordinating recommended changes are given in Volume III. Some
triggers that may direct a surveillance action be taken are:

- Updated Occupational Standards
- Job Duty Task Analysis
- Rating Mergers/Consolidations
- Rating Disestablishments
- Requirements Sponsor Changes
- Naval Training System Plan Revisions
- Change to existing operating procedure or policy
- Change in Technical Directives
- Change in Navy Mission Essential Task List (NMETL)

2.2. Training Materials Modifications. There are four
categories of training materials modifications: Interim Change,
Change, Technical Change, and Revision. The definition for each
category is found in NAVEDTRA 135 (series) Chapter 4, Section
1.3. Procedures for incorporating training materials
modifications are described in the sections for those materials
in Volume III, Chapter 8 of this manual.

SECTION 3 - PROGRAM PARTICIPANTS

The following participants have vital roles in the development and support of training materials. Specific command assignments are addressed in Volume III, Chapter 1 of this manual.

3.1. Training Agency (TA): A TA is an office, bureau, command, or headquarters exercising command of, and providing support to, some major increment of the Department of the Navy's formal training effort. The Commander, NETC is a TA.

3.2. Training Support Agency (TSA): An office, command, or headquarters responsible for providing material and other forms of support to the TA. The TSA is normally a Systems Command (SYSCOM) (e.g., Naval Sea Systems Command) responsible for providing training support to the TA for a piece of equipment, a subsystem, or a system.

3.3. Learning Centers (LCs)/Functional Commander: NETC has designated LCs and/or Functional Commanders to plan, manage, and budget for training courses across broad functional areas.

3.4. Curriculum Control Authority (CCA): The CCA controls the course content and instructional methods by acting as approval authority for the curriculum. The CCA is also responsible for maintaining the curriculum through new development or revision of training materials. For courses conducted at schools under other Functional Commanders, the CCA will advise the other Functional Commanders of curriculum development/revision efforts which result in additional resource requirements, new course lengths, and/or course convening schedule requirements. Volume I of NAVEDTRA 10500, Catalog of Navy Training Courses (CANTRAC) in the Corporate enterprise Training Activity Resource System (CeTARS) identifies the CCA for existing courses. NETC LC Commanding Officers are designated as the CCA. Additionally, Type Commanders (TYCOMs), Joint Weapons Training Command, and Operational Units which develop, deliver and maintain training can also be designated as the CCA. The original intended functional control identification of the Course Identification Number's (CIN's) single letter for the most part may not always be the case due to changes in the Navy Training organization by the Revolution in Training (RIT) and or LC stand-up, merge, and disestablishments. NAVEDTRA 135 (series), Chapter 1 delineates the CCA duties and responsibilities that NETC has retained.

3.5. Course Curriculum Model Manager (CCMM). A CCMM is assigned by the CCA with the responsibility for conducting and maintaining a specific course. The CCMM initiates curriculum development and training materials modification, conducts curriculum reviews and analysis of feedback, maintains course audit trail documentation, and develops and approves changes. The CCMM normally functions as the developer for Navy in-house-developed courses. However, the CCA can also designate personnel, other than the assigned CCMM as required, to perform these functions. CCMM functions as the developer and first line of approval authority for in-house and contract developed curriculum.

3.6. Learning Site (LS): A Navy command which has a primary mission of conducting or supporting training at schools or institutions at which courses are offered. The LS has responsibility for maintaining selected audit trail documents, annually reviewing training materials in the form of a Formal Course review, making recommendations to CCMM for changes/ revisions, and maintaining training equipment and facilities.

SECTION 4 - APPLICABLE DOCUMENTS

The documents listed in Sections 5 and 6 are the primary resources to be used by activity developers in the design and development of training materials. Use of documents and manuals in effect on the date stated in the project plan is assumed. Later issues of these specifications, standards, documents, and publications, or new specifications, standards, documents, and publications, may be used subject to joint agreement of the CCA and activity curriculum developers.

SECTION 5 - STANDARDS, GENERAL

In June 1994 the Secretary of Defense (SECDEF) directed that "Performance specifications shall be used when purchasing new systems, major modifications, upgrades to current systems, and non-developmental and commercial items for programs in any acquisition category (in lieu of military specifications and standards)".

Source: SECDEF Memo, Subject: Specifications and standards - A New Way of Doing Business, of 29 June 1994. Consequently, references to military standards (MIL-STDS) have been deleted.

5.1. **Department of Defense**: DODDIR 5000.01 MIL-HDBK 502

SECTION 6 - PUBLICATIONS

6.1. Secretary of the Navy:

- SECNAVINST 5870.4 (series), Permission to Copy Material Subject to Copyright
- SECNAVINST 5510.30 (series), Department of the Navy Personnel Security Program Instruction

6.2. Chief of Naval Operations:

- OPNAVINST 1500.27 (series), Interservice Training
- OPNAVINST 1500.47 (series), Navy Training Quota Management
- OPNAVINST 1500.74 (series), Utilization of Enlisted Occupational Standards for Training and Career Development
- OPNAVINST 1500.75(series), Safety Policy and Procedures for Conducting High Risk Training
- OPNAVINST 1500.76 (series), Navy Training System Requirements, Acquisition, and Management
- OPNAVINST 3104.1 (series) Navy Visual Information (VI) Production, Replication, distribution and Management Information System Policy, Responsibilities, and Procedures
- OPNAVINST 3500.34 (series) Personnel Qualification Standards (PQS)Program
- OPNAVINST 3500.39 (series), Operational Risk Management
- OPNAVINST 5100.19 (series), Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
- OPNAVINST 5100.23 (series), Navy Occupational Safety and Health (NAVOSH) Program Manual
- OPNAVINST 5513.1 (series), Department of the Navy Security Classification Guide
- OPNAVINST 11102.2 (series), Training System Installation and Transfer
- NAVPERS 18068 (series), Vol I and Vol II Manual of Navy Enlisted Manpower and Personnel Classifications and Occupational Standards (NEOCS)

6.3. Commander, Naval Education, and Training Command:

- NETCINST 5100.1 (series), Occupational Safety and Health, Training Safety and Firefighting Training Certification Programs
- NAVEDTRA 130 (series), Task Based Curriculum Development Manual
- NAVEDTRA 131 (series), Personnel Performance Profile Based Curriculum Development Manual
- NAVEDTRA 134 (series), Navy Instructor Manual
- NAVEDTRA 135 (series), Navy School Management Manual
- NAVEDTRA 10052-AJ Bibliography for Advancement Study
- NAVEDTRA 10500, Catalog of Navy Courses (CANTRAC)
- NAVTRASYSCEN P-530, Naval Training Systems Center Guide
- NETCINST 1500.3 (series), Institutional Accreditation
- NETCINST 1500.4 (series), Interservice Training Review Organization (ITRO)
- NETCINST 1510.1 (series), Navy Training Management
- NETCINST 3104.1 (series), Visual Information (VI) Program Management
- Training Requirements Data Base Annual Report – Naval Education and Training Program Management Support Activity (NETPDTC)

6.4. Others:

- MPT&E CIOSWIT-ILE-STD-1B, Navy ILE Presentation Standards
- MPT&E CIOSWIT-ILE-GUID-3B, Navy ILE Instructional Content Style guide, Interactive Multimedia Instruction & Instructor Led Training
- DOD MILHDBK 29612.3A, DOD HDBK Development of Interactive Multimedia Instruction (IMI) (Part 3 of 5)
- MIL-PRF-29612B, Training Data Products
- MIL-HDBK 29612-1A, Guidance for Acquisition of Training Data Products and Services (Part 1 of 5)
- MIL-HDBK 29612-2A, Instructional Systems Development/Systems Approach to Training and Education (Part 5 of 5)
- MIL-HDBK 29612-4, Glossary for Training (Part 4 of 5)
- MIL-HDBK 29612-5, Advanced Distributed Learning (ADL) Products and Systems (Part 5 of 5)
- NAVSEAINST 4790.8 (series), Ships Maintenance and Material Management (3-M) Manual (Vol 1-3)

SECTION 7 - SECURITY REQUIREMENTS

Classified information will be handled in accordance with the Department of the Navy Supplement to the DOD Information Security Program Regulation (OPNAVINST 5510.1 (series)).

SECTION 8 - SAFETY REQUIREMENTS

Safety, occupational health, and hazard awareness information must be incorporated into the curricula of all appropriate training courses, as prescribed by NETCINST 5100.1 (series) and in NAVEDTRA 135 (series).

PLANNING

CHAPTER 2

TRAINING PROJECT PLAN

INTRODUCTION

Curriculum development project is a complex undertaking, bringing together a wide range of human and material resources for the goal of creating quality training. Curriculum development consists of six phases, beginning with the Plan Phase. This phase consists of gathering information and building a curriculum development plan. The output product of this phase is the Training Project Plan (TPP). When approved, the TPP becomes the authorization to undertake a course revision or a new course development project through the Pilot and Implementation Phases, and the initiation of resource requisitions. A TPP is also required to cancel a course. This chapter provides amplifying information, sources of data, and a structure for developing and assembling a TPP.

GOVERNING INSTRUCTIONS AND DIRECTIVES. Throughout this chapter, numerous instructions are cited. This ensures that actions governed by instructions are carried out per the latest directives. Accordingly, instructions cited are assumed to be the most current, and series suffixes are not used. A manager should review the instructions listed in Chapter 1 to ensure that applicable requirements are considered throughout the curriculum development process.

NETCINST 1510.1 (series), NAVEDTRA 135 (series) and amplified by OPNAV Memorandum for Distribution 7000 N1 127189 of 15 September 2008 are the primary governing requirements for a TPP, and its approval. The information in this chapter must be applied in accordance with the current issue of these references.

SECTION 1 – PLANNING FOR COURSE REVISION, NEW COURSE DEVELOPMENT OR COURSE DEACTIVATION

Most TPPs will be for revisions to existing courses – reflecting the constant introduction of new equipments, processes, and technologies into the Fleet. Although fewer in number, new course development projects respond to new requirements that cannot be met by revising an existing course. Courses are canceled when they become obsolete, or the training they provided is absorbed by other courses.

- The Plan Phase is the first of the six phases in the training materials development process. The output, the TPP, provides the blueprint and justification for the revision of an existing course, development of a new

course, or course deactivations. "Revision," for our use, is defined in NAVEDTRA 135 (series). In general, a revision means that the course mission has changed, course length is increased, or additional resources are required. A decrease in course length may also fall under the definition of a revision; the CCA will direct submittal of a TPP.

COURSE REVISION: A TPP will be developed and approved per NAVEDTRAs 135, 130 and 131.

NEW COURSE DEVELOPMENT: Completing a TPP for new course development requires establishing a Course Identification Number (CIN), Course Data Processing Code (CDP), initiating entries for the Catalog of Navy Training Courses (CANTRAC) and Corporate Enterprise and Training Activity Resource System (CeTARS), identifying preliminary resource requirements, and possibly planning for facilities requirements. This entails careful research and documentation. See NAVEDTRA 135 (series) for specific guidance of establishing a new course.

COURSE DEACTIVATION: NETCINST 1510.1 (series), NECTNOTE 1500 of 4 January 2010, and NAVEDTRA 135 (series) contain procedures for initiating and documenting the deactivation of an existing course or training program. A TPP is required.

SECTION 2 - JUSTIFICATION FOR COURSE DEVELOPMENT, REVISION, AND DEACTIVATION

There has to be a reason (or reasons) to undertake the development of a new course, the revision of an existing course, or to cancel a course. The justification for initiating these actions may come from:

- Navy Training System Requirements, Acquisition, and Management Plans, OPNAVINST 1500.76 (series):

  - Introduction of new weapons systems or engineering, or changes/modifications to existing systems
  - "Life-cycle" documents reviewed and updated annually

- Tasking by higher authority:

  - OPNAV. Introduction of new technologies, techniques, or equipment not supported by an NTSP, which can replace existing subjects, be added to an existing course, or require a new course.
  - OPNAV. Fleet manning requirements may dictate an increase (or decrease) in student throughput, which requires an adjustment in resources.
  - NETC. Addition of "by direction" topics or courses, or mandated course reductions.

- Internal course reviews and local command initiatives:

  - Course reviews or data analysis determine students are not meeting course objectives and need additional "hands on" time that can only come from extending the course length.
  - Combining, re-sequencing, or deleting subject's permits objectives to be met in less time and the decrease in instructional periods impacts instructor manning.
  - Data analysis or studies may show that a new course cans "common core" subjects which are now taught in several separate courses.

- External course reviews: Indicates problems with course content (obsolete objectives) or structure in terms of graduates not being able to perform on the job.
- Surveillance and external feedback:

  - The Navy Training Feedback System (NTFS) provides input mechanisms, data analysis, and feedback to ensure that training ashore meets Fleet requirements.
  - Job Duty Task Analysis (JDTA) is the process that NETC is maturing to list the jobs performed by an occupational field, who performs them, and the frequency of performance. A survey of jobs performed within a rating may indicate a need to revise training.
  - Human Performance Requirement Review (HPRR) consists of course reviews by Fleet, Learning Centers (LC), and Systems Command (SYSCOM) representatives to assess existing training and to identify inefficiencies, redundant or unnecessary material.

- Training Appraisal
- Updated Occupational Standards
- Enlisted Rating Mergers

SECTION 3 - TPP

The TPP presents a blueprint for curriculum development which contains course data, justifications for the course revision, new course development, or course deactivation. It includes impact statements, milestones, and resource requirements. Supportive information in developing the TPP can be found during the decision process of the project with Front End Analysis (FEA) and Business Case Analysis (BCA).

- The following paragraphs provide some general information on Training Project Plans.

Each project plan will be as unique as the project it describes. Your project may not require every item of information included in this chapter or shown in the Volume II TPP sample. Alternatively, your project plan may benefit from additional items and enclosures. The CCA and Functional Commander, working with the TPP developer, shall designate mandatory TPP elements, and possibly call for additional data which will reinforce the project plan. A sample package may be provided to guide developers, or additional requirements may be levied by command instructions. All data should be researched, referenced, and be as accurate as possible. However, the TPP is recognized as a planning document, subject to revision.

3.1. Purpose and Use of a TPP: The TPP describes all training and training support elements required to provide trained personnel to operate and maintain systems or equipments, or perform tasks and functions. It provides a Plan of Actions and Milestones (POA&M) to achieve a predetermined implementation date. A TPP describes all the factors necessary to prepare and conduct a successful training program and attain optimum use of personnel, hardware, and funds. The course revision or development described in the TPP should meet, and not exceed, the training requirement. In the case of a course deactivation, the TPP provides justification for the action and a blueprint for reallocation of resources.

3.2. Categories of Resources: Course development and, often, course revisions require resources to develop or implement the proposed course. Course deactivations may also require resources for such things as the removal and redistribution of equipment. Resources fall into four broad categories: (1) facilities, (2) funding, (3) personnel, and (4) equipment. All four categories require long lead-time planning. An approved TPP is the authority to submit requests for resources. Whenever resources are affected by unfunded requirements, OPNAV requirement per Memorandum for Distribution 7000 N1 127189 of 15 September 2008 requires that a TPP is routed to OPNAV (N15) via NETC (N7) for approval and resource allocation.

- Facilities include new construction, and modification of existing structures such as interior arrangement, power requirements, and air conditioning. Basic categories are Military Construction (MILCON) and Special Projects, with the difference being cost, approval authority, and lead time.

3.3. MILCON projects should be identified six (6) years prior to the ready for training date to ensure availability of permanent facilities. Relocatable facilities can be used as interim workaround solution, but require Commander, Navy Installation Command (CNIC) approval.

3.4. Special Projects needed to repair/renovate existing facilities or install training equipment should be identified three years prior to the ready for training date. Contact NETC (N4) for assistance.

- Funding includes all developmental and material costs anticipated for the project through the pilot convening.
- Personnel includes instructional and support personnel to conduct the course. Any increase in personnel must be identified and justified. A decrease in course length may also require a manpower adjustment.
- Equipment includes specialized items, systems, tools, or equipments required to support and conduct training.

When preparing the TPP ensure to identify any issues with berthing (including furniture), galley, or other base operating support (BOS) services requirements (bus transportation, janitorial, leased relocatable facilities, etc), particularly for those TPPs that propose an increase in Average On Board (AOB). Learning Sites (LSs) should coordinate these requirements with the local host installation prior to submitting the Training Program Plan (TPP). Stand-up of training inside the Program Objective Memorandum (POM) process may LC/LS resourcing until CNIC has an opportunity to POM for them.

Life-cycle costs for training equipment, Embedded Computer Resources (ECR), and content maintenance. Costs should include tech refresh and ITSO support for ECRs. Costs should include DLR, overhaul, and COMS costs for training equipment. Costs should include cyclic maintenance of content for Computer Based Training (CBT).

Propose how ECR requirements will be met. Is ECR requirement for a new ECR, or existing? Need to modify or improve the capability of the existing ECR? If new, who would fund the procurement/installation? If ECR requirement has been previously programmed reference documentation/coordination.

SECTION 4 - INITIATING A TPP

The decision to prepare a TPP can come from the LC/LS Commanding Officer, or Officer-in-Charge, or from higher authority.

- The Course Curriculum Model Manager (CCMM) will develop and submit the TPP for a course revision or deactivation.
- The CCA can designate an activity to be the CCMM for a new course and direct them to develop the TPP, or it may be developed by the CCA.
- When Functional Commanders in addition to the CCA are involved in teaching a course, preparation of a TPP should be coordinated with these functional commanders.

SECTION 5 - LOCATING DATA FOR COMPLETING A TPP

Any source which can be used to justify the project and identify the costs can be used in completing a TPP. Examples of some sources are:

- Technical manuals. Manuals should be used to the maximum extent possible as the basis for course content, equipment, and related material.
- Logistic Support Analysis Report (LSAR). A listing of jobs, and the detailed tasks to accomplish each job.
- Navy Training System Plans (NTSP):

  - Part II: Billet Requirements
  - Part III: Personnel and Training Requirements
  - Part IV: Training Logistic Support Requirements

- CeTARS data. Master Course Reference File (MCRF) displays out year student loading
- Resource Requirements. A composite listing of material necessary to implement the course at each site

SECTION 6 - SELECTING CURRICULUM DEVELOPMENT METHOD

The Navy uses several different methodologies, or systems, for developing training programs. The Task Based method and the PPP/Training Path System (TPS) method account for most training program development. Either system is equally capable of being used to develop all varieties of training programs. Each has characteristics and unique features that make it better suited for developing certain training programs. NAVEDTRA 130/131 (series) do not address the Navy's Integrated Learning Environment (ILE). However, the content development guidance serves as a development standard and the foundation for development in ILE.

6.1. The Task Based Method was designed for developing training programs that teach performance of a job or function in which operation or maintenance of the hardware is usually incidental or secondary to actual performance of the job. This manual – NAVEDTRA 130 (series): Task Based Curriculum Development Manual – provides details on this method.

6.2. The PPP/TPS System was originally designed for developing training programs that teach operation and maintenance of "hardware," such as equipments, subsystems, or a system. The

PPP/TPS system is advantageous where equipment or procedures are subject to frequent updating or change. NAVEDTRA 131 (series): PPP Based Curriculum Development Manual provides details on this method.

6.3. NETCINST 1510.1 (series) and NAVEDTRA 135 (series) contains guidelines for determining the system for development of training materials. Which system is selected should largely be determined by the needs, desires, and experience of those training activities which will implement and conduct the training program. It is the training activities receptiveness to the delivered training program which will largely determine whether the training program succeeds or fails.

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SECTION 7 - TPP OUTLINE

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The TPP shall contain all the data and information necessary to identify and justify the course revision or development and the resources required for the training course under consideration. Data for course deactivations is also provided. Specific elements of data and information shall include the following items where applicable. A sample TPP is provided in Volume II, Tab A of this manual.

7.1. Cover Page, to include:

- The phase "Training Project Plan for"
- Complete course title (actual or proposed), with no abbreviations
- CIN, if known. A new course development may not have a CIN assigned at the point the TPP is developed. CINs are assigned by the CCA as per NETC N73 guidance.
- The activity or organization for which the TPP is prepared. This is the sponsoring or tasking agency, usually the CCA.
- Name and address of the entity preparing the TPP
- Month and year that the TPP is prepared. This is a publication date and may differ from the transmittal or approval letter date. For a revision, the date is shown in parentheses under the original publication date.
- Security classification (if required). TPPs should be unclassified if possible. See SECNAVINST 5510.36 (series) for additional guidance on security classification.

7.2. Table of Contents. The table of contents shall be page 2, immediately after the cover page.

7.3. Course Data Pages, to include:

- The phrase "Course Data."
- Course title, with no abbreviations
- CIN, if assigned
- CDP code. This is a CeTARS identifier which will be different for each training site
- Course Status. Identify whether new start, revision, or deactivation of training
- Course Mission Statement. This is the purpose of the course, and responds to each of the questions below. Indicate if the course mission statement will change as a result of the course revision. The examples below illustrate the types of statements used to answer each question:

  WHO is to be trained? "...technicians in the IC rating (E-5 through E-7)...", "...entry level enlisted Operations Specialist...,""...Aviation Electronics Technicians, Aviation Antisubmarine Warfare Operator, and Aviation Electrician's Mate's..."

  WHAT job will the person be trained to perform? "...operation and maintenance of the Inertial Navigation System...", "...instruction and practical application in security fundamentals, basic message format, teletype typing proficiency, message tape preparation, teletypewriter circuit operating procedures, and basic safety precautions...", "..._AN/USM-484 Hybrid Test Station operational procedures, test procedures, emergency procedures, and scheduled maintenance procedures..."

  DEGREE OF QUALIFICATION or how well the person will be able to perform the job? "...to perform tasks at the apprentice (journeymen, master) level...", "...to the accuracy specified in supporting documentation..."

  WHERE will the person utilize the training? "...ashore and onboard amphibious assault (LHD-and LHA-1) class ships, in port and underway...", "...in afloat and shore communication installations...", "...in the AIMD working environment..."

CONDITIONS under which the graduate will perform on the job "...under supervision and using technical references...", "...in both field and shop conditions...", "...under all conditions of ship readiness..."

- Occupational classification. Applicable rate, rank designator, Navy Enlisted Classification (NEC), or Navy Officer Billet Classification (NOBC) of the intended input population, and the NEC, NOBC, or MOS earned by course graduates. If it is proposed that an NEC will be issued or changed as a result of the revised course, consult NAVPERS 18068 (series) for guidance.
- Prerequisites. List the prerequisites required of the trainees that are scheduled to attend the course. Prerequisites may be equipment, rate or rating specific, basic skills, or course specific. Prerequisites normally relate to prior training or skills, not ASVAB scores.
- Course overview. A listing of course subjects. Note any changes from the previous project plan. For a new course this will be a description of the skills and knowledge to be attained. This is not intended to be the equivalent of a curriculum outline, or to contain objectives. The overview helps the Training Agency see what the course will actually contain.
- Course length. Both current and planned course lengths in calendar days should be given.
- Training sites. Commands or activities where the course will be taught. This information can be combined with the CDP codes, if known. For multi-site training, an asterisk (*) may be used to indicate the CCMM.
- Number of convening's. Number of classes per year for each site, both current and planned.
- Class capacity. Specify the current and planned minimum and maximum class capacity, and if the class capacity will vary between teaching sites.
- Planned AOB, current and planned. This is:

$$\frac{\text{Course length in calendar days X Planned input X \# of Convening's}}{365}$$

- Planned input should include:

  - USN
  - Reserves of all categories
  - Other Services
  - International training students

- Annual student throughput, current and planned.

- Estimated instructor and support requirements.

  - Provide the total number of instructor and support
    personnel required, current, and/or planned. NAVEDTRA
    135 (series) describes the factors required for
    standard instructor computation. Many of the factors
    listed, such as classroom and laboratory ratios and
    instructional periods, may not be known at this point.
    If the standard computations cannot be applied,
    provide the rationale for the instructor and support
    manning figure used.

7.4. Justification. Cite specific references, correspondence,
results of conferences, NTSP, FEA, BCA, TPS data, etc., where
available.

- Reasons for and anticipated benefits of the proposed
  project:

  - Provides required training
  - Reduced course length
  - Increased student throughput
  - Impact of skill training requirements on the
    occupational classification system. A new course in
    "pipeline" training may provide an entrance or exit
    point to put graduates into the Fleet earlier
  - Reduced attrition and attendant costs by providing
    "common core" training
  - Deactivation of obsolete or redundant training

- Sources of information or data:

  - Tasking by higher authority. Cite specific
    correspondence
  - Internal review has indicated a need for training best
    met by a new course or a revision to an existing
    course

- External feedback/review. Current graduates are not able to perform on the job, or lack specific skills
- JDTA data. JDTAs are normally accomplished as part of the curriculum development Analyze phase, but existing JDTA data should be used, if available
- TPSs are normally accomplished as part of the curriculum development Design Phase, but TPS data should be used, if available

- Impact if the course development or revision is not undertaken: Clearly describe the impact on Fleet requirements and capabilities if the proposal is not undertaken. Note that this is NOT the same as "Justification." "Justification" is the authority behind the proposed revision. "Impact" refers to the consequences to the Navy of maintaining training in the current mode.

EXAMPLES:

Shortfall in numbers of trained personnel

Inability to operate or maintain updated Fleet equipment

Dollars not saved by deleting obsolete objectives and consolidating remaining objectives into a shorter course

7.5. Safety Risks and Hazardous Materials exposure. Describe anticipated safety risks and exposure to hazardous materials which are absolutely necessary for training realism. Indicate if the proposed training will be designated "high risk" and fall under the purview of OPNAVINST 1500.75 (series) and NETCINST 5100.1 (series). The incorporation of occupational safety and health considerations into training are defined in OPNAVINST 5100.23 (series), and NETCINST 5100.1 (series).

7.6. Curriculum development method recommended

- Curriculum development follows either task-based procedure (NAVEDTRA 130 (series) Task-Based Curriculum Development Manual) or PPP/TPS based procedures (NAVEDTRA 131 (series): PPP Based Curriculum Development Manual). Some of the considerations used to determine the most appropriate curriculum development method may be found in NAVEDTRA 135 (series). Training and Course Supervisors

will provide valuable assistance in determining the skills and knowledge, which will become the foundation for the training development or revision. Specify the development method recommended for use and the rationale for its selection.

- When preparing a TPP developed under ILE instructional development, this is not applicable: List training materials to be produced under the curriculum development procedure selected.

7.7. Compensation. Provide recommended sources of compensation for both manpower and funding. Identify possible course deactivations/reductions, cross utilization of instructors, etc.

7.8. Milestones. A time-phased narrative or graphic representation commencing with TPP approval, milestones shall include identification of major developmental products or events relating to the training materials development method selected, and end with implementation. Projected completion dates for each key event shall be indicated.

7.9. Resource requirements. Provide for each site a best estimate of the known and anticipated resources necessary to implement the training. For a revision, this will be the additional resources required. For a new development, this will be all resources needed to conduct the course. Identification of these resources does not constitute approval of the resources; Chief of Naval Personnel (CNP) Corporate Automated Resource Information System (CARIS) document numbers, cost account codes, and POM documentation must be forwarded:

> It is recognized that not all resource requirements may be known when the TPP is submitted. This is an initial submission, subject to revision.

- Manpower. For new courses or revisions, identify officer, enlisted and civilian billets required, the number of billets authorized, the number of compensated billets that can be provided, and the difference (if any). For deactivations, identify all billets that will be offered up. Specify differences (if any). For questions on multiservice manpower issues, contact the NETC (N5) Inter-service Training Review Organization (ITRO).

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- Funding. Identify by appropriation, such as, Operation and Maintenance Navy (O&MN), other procurement, Navy (OPN), and Activity Group/Sub-activity Group (AG/SAG) the one-time (initial) or recurring costs. For existing courses identify only the additional costs required to implement training.
- Specific expense items should be identified and include the following: Curriculum development, supplies, travel, equipment, publications, and printing.
- Contractor costs should be identified, including curricula development, instructors, and the operation and maintenance of training equipment.
- Equipment. Related end-item equipment. "Related" means those specialized items, systems, or equipments required to support and conduct training. For deactivations, identify the disposition/reassignment of equipment.
- List items, providing as much information as necessary to describe the item, such as:

  - Item name or official nomenclature
  - Part number
  - Cognizance Code/National Item Identification Number/Special Material Identification Code (COG/NIIN/SMIC) (Formerly National Stock Number)
  - Any other identifying code
  - Acquisition Advice Code (AAC)
  - Commercial and Government Entity (CAGE) code Source, Maintenance, and Recoverability (SM&R) code

NOTE

1. When identifying your items, use only the categories and codes that apply to your project. Use your command's logistic resource manager for assistance.

2. Indicate the number of items needed to support the course. Multiple training sites may require a further breakdown by site. In cases where some items are currently on hand, list the additional items needed.

3. Provide unit of issue and unit costs Technical Reference: Use when a technical reference provides source data, amplifying information, or justification for an item.

2-15

EXAMPLE: Maintenance Trainers. Normally, weapons system trainers designed to support on-equipment training, specially developed maintenance trainers, simulators/simulated trainer panels, and other simulator panels.

EXAMPLE: Technical Training Equipment (TTE). Operational equipment used for training purposes. Actual Weapon Replaceable Assemblies, Line Replaceable Units, Subsystem Replaceable Assemblies, Shop Replaceable Units, Circuit Card Assemblies, weapons pylons, engines or equipment normally a part of a weapon system.

- Test Equipment:

  - Special Purpose Electronic Test Equipment (SPETE). Test equipment designed to generate, modify, or measure a range of functional parameters for a single electronic system or equipment. For example, test equipments which perform diagnostics and troubleshooting on specific aircraft; normally provided by the SYSCOM.
  - General Purpose Electronic Test Equipment (GPETE). Electronic test equipment which may be used to test two or more equipments or systems, of basically different design, by generating, modifying, or measuring a range of electronic functions.

    EXAMPLE: Oscilloscopes, multimeters - Where GPETE is not being provided by a SYSCOM or other sponsor, the Learning Center requests the equipment. Refer to OPNAVINST 11102.2 (series) and ILE website, https://www.netc.navy.mil/ile/index.aspx. GPETE is normally a long lead-time item.

- Visual Information (VI) devices such as projectors, video playback equipment, overhead projectors, projector screens, movie projectors, television monitors, etc.

  - VI aids. Provide a summary listing containing an estimate of the VI aids required to conduct the proposed training course. OPNAVINST 3104.1 (series) is the basic reference for these items.

- Special-purpose tools, alignment jigs, and fixtures. GO/NO-GO gauges, adapters, and other tools especially designed for maintenance of weapon systems and normally listed in the technical manual.
- Common hand tools. Tools required performing the training which is not unique to the equipment.
- Consumables. Items that are required for the course, such as computer disks, special printing paper, plating materials, connector parts, rags, cotton swabs, etc. List quantity required per class. Do not include items that are provided to the students and then retrieved after class.
- Training Devices. Engine cutaways, models, inert bombs/weapons, and other devices especially prepared for demonstration and handling safety. Unless provided by an OPNAV sponsor, these items can have exceptionally long development and procurement lead-times. NAVTRASYSCEN P-530 Navy Training Systems Center Guide refers.
- Specialized maintenance trainers and operator training devices (support training but cannot be substituted for operational equipment).
- Operational and training software, if not included with the hardware. Also, if the software must be modified, the scope of the modifications shall be included. This category also includes Interactive Courseware (ICW).
- General purpose equipment dedicated to a specialized task. For example, general purpose computers "wired in" and used to control training devices.
- Support equipment (Non-Avionic). Maintenance stands, bomb skids, engine stands, mobile hydraulic and electrical power units, mobile air conditioning units, engine removal trailers, and similar materials. NOTE: This category does not include line maintenance test sets.
- Calibration standards. Calibration standard test equipment used in the calibration of electronics equipment and test sets. These items are identified by a "-CS" at the end of the part number.
- Faultable/Pre-faulted modules. Modified modules, or modules that will be modified with insertible faults or malfunctions, for use in troubleshooting and performance testing.
- Trainer-peculiar materials. Items that are used in direct support of the trainer, such as trainer-peculiar special tools or special support equipment.

- Miscellaneous materials. Special clothing, goggles, standard work benches, special furniture, equipments, and items which do not fall under any category identified above.
- Ordnance/Ammunition/Pyrotechnics. Live, dummy, or inert. List by description and identifying numbers. Per the Conventional Ammunition Integrated Management System (CAIMS), SPCCINST 8010.12 (series), include the Navy Ammunition Logistics Code (NALC) for each item. The NALC can be appended to the NSN for each item. Specify requirement per student and per class.
- Stand-alone computer systems and peripherals. For example, desktop computers and printers used to deliver instruction. Not administrative or office support equipment.
- Equipment refurbishment. Available equipment which can be used to support training after repair, overhaul, or modernization.
- Publications. Commercial, DoD, and military service publications or technical manuals required to conduct training. List by title, identification number, quantity required, and supplier.
- Training material. The type and estimated quantity of training materials needed to conduct training. This includes instructor guides, trainee guides, instruction sheets, etc. Quantities and costs should be estimated through course pilot, or until training activity funding support can be established.
- Facilities. Identify requirements for MILCON or special projects for facilities modification. These requirements are highly situation-specific. See OPNAVINST 11102.2 (series) for detailed facilities documentation requirements.

EXAMPLE: A major training device needs to be relocated by the command as part of a course development or revision project. Or, additional electrical power and cooling are needed to support new equipment being installed in an existing space. This can also include accommodations and adaptations for safety, such as vapor/gas inductors, filtration, incineration, hazardous materials storage, handling, and disposal facilities.

- Early consultation with the training activity facilities manager is essential to determine the scope of the modification or construction, the level of approval and

funding required. Funding thresholds are repairs and
construction less than 500K = Host Installation/Region
Funding.

- Repairs Greater than 500K = CNIC Special Projects
  Funding.
- Construction Greater than 500K and Less than 750K =
  CNIC Special Projects Funding.
- Construction Greater than 750K = MILCON = CNIC MILCON
  Program.

SECTION 8 - TPP APPROVAL

  A TPP is submitted via the chain of command for approval at
the appropriate level as specified in NETCNOTE 1500 of 4 January
2010, NAVEDTRA 135 (series), and OPNAV Memorandum for
Distribution 7000 N1 127189 of 15 September 2008.

> Approval of the TPP may be used as authorization for
> submission of CPATS, POM and procurement of long lead-
> time items such as major training devices.

STAGE ONE

CHAPTER 3

PERSONNEL PERFORMANCE PROFILE TABLES

INTRODUCTION

The development of equipment tables will follow the definition of operational and maintenance specifications. Development of subsystem and system tables follow, based on the equipment tables. Data gathering and analysis for task/function and background tables should begin as soon as requirements are recognized.

- A Personnel Performance Profile (PPP) table must be usable for training all groups of personnel (Coordinate, Direct, or Perform). The most serious error in PPP table development occurs when a table is developed for a specific course of instruction. This results in a table which includes a list of line items relating only to the skills and knowledge required for that course, and subsequently reduces the utility of the PPP table for other courses of instruction.
- PPP tables will be developed in accordance with guidance contained in this manual.

PPP Tables. PPP Tables list the minimum knowledge and skills required to coordinate, direct, or perform operation and maintenance. The five types of PPP Tables are:

HARDWARE (E/SS/S)	NON-HARDWARE (T/F or B/G)
Equipment	Task/Function
SubSystem	Background System

PPP TABLE PACKAGE CONTENTS. Your project may contain any combination of the above tables. Normally, several PPP tables are developed for a particular program. When completed, they are delivered to the Curriculum Control Authority (CCA) for review as a package. Use the checklist below to ensure you include all required elements.

ELEMENT	CHECK HERE
1. PPP Cover including the Date of Issue	☐
2. PPP Table Listing including:	☐
a. PPP Table Title	☐
b. Originating Activity of each PPP Table listed	☐
3. PPP Table Title Page including:	☐
a. Assigned PPP Table Number	☐
b. Latest Equipment Modification Record Number	☐
c. New Design-Drawing Number	☐
4. All Applicable E/SS/S, Task/Function, or Background PPP Tables developed or revised for the project	☐

FIGURE 3-1: PPP CHECK LIST

SECTION 1 - PPP REPOSITORY (PPP REP)

Naval Education and Training Command (NETC) has been designated as the PPP Representative. It is tasked to:

- Maintain an Automatic Data Processing (ADP) data bank of all approved and under development PPP tables
- Ensure that developers are provided timely, effective access to all PPP Tables when requested by the Training Support Agency (TSA), Training Agency (TA), or CCA
- Liaison with the CCAs for the assigning of numbers for PPP tables under development

SECTION 2 - PPP DEVELOPMENTS

- PPP tables used in support of new development or revision come from the following sources. Develop a PPP table listing identifying:

  - New tables to be developed. PPP table development is covered in Volume I, Chapter 3 of this manual.
  - Existing tables to be modified. Modifications permitted to existing tables to expedite their use in development are covered in this chapter.
  - Existing tables to be used unchanged.

Change and Revision to existing PPP tables as a maintenance action is discussed in Chapter 8.

- Establish a PPP development schedule to meet the timeline of the Training Project Plan (TPP) Milestones.
- Existing PPP tables to be used unchanged or modified for use: Tables listed as Under Development (UD) may be requested from the cognizant sponsor and utilized for development, with the understanding that such tables may not be in their final form. The requester must be added to the developer's distribution list for updates and final documents.
- Obtain from the PPP representative a table number for each new PPP table to be developed and a number for the projected Training Path System (TPS).
- Draft new PPP tables. PPP tables represent the foundation knowledge and skills upon which a course is developed. Existing tables should be used to the maximum extent possible before consideration is given to developing a table.
- Modify existing tables. The only modification permitted to existing PPP tables will be addition of sub-items to existing line items or inclusion of new knowledge and/or skill line items to meet new job task requirements which must be incorporated into the course under development.
- Submit new and modified PPP tables to CCA for review/ approval in support of further development:

  - CCA grants preliminary approval for the new and modified PPP table drafts.
  - Preliminary approval serves to establish these tables for use in further development. Subsequently, only changes mandated by changes in equipment, documentation, or operations/maintenance policy need be addressed.

- Submit all PPP tables used in developing the course as supporting documentation for the Training Course Control Document (TCCD) (see Chapter 5 of this volume for more discussion on submission of the TCCD).
- After the Course Pilot:

  - Forward newly developed and CCA-approved PPP tables to the PPP REP.
  - Final approval for new and modified PPP tables will normally come after the first curriculum supported by the tables has been successfully piloted.
  - Modified PPP tables should be forwarded to the PPP's originator.

- The PPP's originator will determine if the original
  PPP table maintained by NETC should be modified.

- PPP REP will add final or approved PPP tables to the data
  bank, removing the UD designation, indicating that the
  approved table is available for distribution:

  - PPP REP will maintain database and provide hard copy
    PPP tables to developer or as requested by the
    TA/TSA/CCA/Course Curriculum Model Manager (CCMM).
  - PPP REP will publish and distribute quarterly a list
    of PPPs that are approved and available for use.

SECTION 3 - REVIEW AND APPROVAL

  The CCA will review and approve all Navy-developed PPP
deliverables for compliance with NAVEDTRA 131B, Volume I
guidelines.

SECTION 4 - SURVEILLANCE

  The only revisions to PPP tables which will be considered
after curriculum has been developed, approved, and implemented,
are those which are necessitated by changes in equipment,
documentation, or operational/maintenance policy in the tactical
program. In general, changes or revisions to PPP tables will
cause a Technical Change, Change, or Revision to curricula.
Other than the above, routine surveillance of PPP tables is not
required or desired. Each CCMM, for courses under their
cognizance, will:

- Review PPP tables for currency, adequacy, and accuracy
  whenever a course revision or new course development is
  undertaken.
- Review technical changes to hardware or documentation and
  evaluate them for impact on existing PPP tables and
  curricula.
- Provide impact comments and/or draft PPP tables when
  appropriate changes are indicated to the TSA or CCMM as
  applicable. Each CCMM, for courses under their
  cognizance, will make recommendations and provide impact
  comments and/or draft PPP tables to the CCA when changes
  are indicated for PPP tables or related courses.

STAGE ONE

CHAPTER 4

TRAINING PATH SYSTEM

INTRODUCTION

The Training Path System (TPS) describes the breadth and depth of required training. TPSs can be developed either for pipeline/continuum training or for individual courses. Most developers will be concerned with an individual course. The TPS is the first course-specific document though it may also be a pipeline specific document. TPS development procedures are described in Volume I of this manual.

TPS Contents. Use the checklist provided below to ensure that all elements of the TPS are included in your TPS.

ELEMENT	CHECK HERE
1. Cover Page	☐
2. Table of Contents	☐
3. Introduction	☐
4. Training Objective Statements (TOS)	☐
5. Training Level Assignment (TLA) Tables	☐
6. Table Assignment Matrix (TAM)	☐
7. Training Path Chart (TPC)	☐
8. PPP Table Index	☐

SECTION 1 - DESCRIPTION AND APPLICATION OF THE TPS

- The TPS consists of the following elements:

    - TOS: The TOS describe the skills and knowledge to be learned for a specific group (Coordinate, Direct, Perform) of personnel.
    - TLA: The TLA lists specific PPP line items to be taught, where each will be taught, and the degree of training to be provided for each line item.
    - TAM: The TAM summarizes the training requirements for PPP Tables listed on the TPC by showing all TOS associated with each PPP table.
    - TPC: The TPC graphically shows a complete training path for a category of learner by listing courses in the path, and the PPP Table Index listing all PPP tables covered by each course.

SECTION 2 - TPS REPOSITORY (TPS REP)

NETC has been designated as the TPS REP. It is tasked to:

- Maintain an ADP data bank of all approved and under development TPS.
- Ensure that developers are provided timely, effective access to all TPS when requested by the Training Support Agency (TSA), Training Agency (TA), or Curriculum Control Authority (CCA).
- Liaison with the CCAs for the assigning of numbers for TPSs under development.

2.1. TPS Development Process;

- Request finalized TPS of interest from TPS REP. TPSs listed as UD may be requested from the cognizant sponsor and utilized for development, with the understanding that such TPS may not be in their final form. The requester must be added to the developers' distribution list for updates and final documents.
- Establish a TPS development schedule to meet the timeline of the Training Project Plan (TPP) Milestones.
- Obtain from the TPS REP an identifying number for the TPS to be developed.
- Draft TPS. (See Volume I, Chapter 4 for guidance on developing the TPS elements.)

  - Select or modify TOS model statements
  - Draft TLA for each PPP table listed in the PPP Table Index
  - Draft TAM
  - Draft TPC or PPP Table Index. The full TPC is required for pipeline/continuum training. If the TPS is being developed for a single course, only the PPP Table Index is required.

- Submit preliminary TPS to CCA as part of the preliminary Training Course Control Documents (TCCD) (See Chapter 5 of this volume for more discussion on submission of the TCCD.
- After the Course Pilot: CCA-approved final TPS is forwarded to the TPS REP. Final approval of TPS will normally come after the curriculum supported by the TPS has been successfully piloted. TPS REP will add TPS to

the data bank, removing the UD designation, indicating
that the approved TPS is available for distribution:

- TPS REP will maintain the database and provide hard
  copy of TPS to developer or as requested by the
  TA/TSA/CCA/Course Curriculum Model Manager (CCMM)
- TPS REP will publish and distribute quarterly a list
  of TPSs that are approved and available for use

2.2. Review and Approval. The CCA will review and approve all
Navy-developed TPS deliverables for compliance with NAVEDTRA
131B, Volume I guidelines. The CCA has the option of calling
for a review and approval of deliverables at any time.

SECTION 3 - TPS CONTROL

- The CCA will control TPS development to ensure:

  - Analysis of the TPS for adequacy and accuracy. The
    TPS is the operational interpretation of the Course
    Mission Statement and establishes the boundaries of
    training materials development.
  - The preliminary TPS is viewed as a "working" document.
    The TPS will be reviewed by the CCA as part of the
    TCCD submittal to ensure that the essential linkage
    exists between the Topic Learning Objectives and the
    PPP table(s), to the training level specified by the
    TPS.
  - Upon final approval the TPS will be forwarded to the
    TPS REP for inclusion in the TPS ADP data bank.
  - The only changes to the TPS which will be considered
    after the curriculum has been developed, approved, and
    implemented, are those which are necessitated by
    changes in equipment, documentation, or operational/
    maintenance policy in the tactical program. In
    general, changes to the TPS will cause a Technical
    Change, Change, or Revision to curricula.

SECTION 4 - SURVEILLANCE

- Each CCMM, for courses under their cognizance, will:

  - Review TPS for currency, adequacy, and accuracy
    whenever a course Revision or new course development
    is undertaken.

- Review technical changes to hardware or documentation and evaluate them for impact on existing TPS and curricula.
- Provide impact comments and/or draft TPS when appropriate changes are indicated to the TSA or CCMM as applicable. Each CCMM or TSA, for courses under their cognizance, will make recommendations and provide impact comments and/or draft TPS for the CCA when appropriate changes are indicated for TPS or related courses.

STAGE TWO

CHAPTER FIVE

TRAINING COURSE CONTROL DOCUMENT

SECTION 1 - INTRODUCTION

The Training Course Control Document (TCCD) is the primary developmental and management document for a course. The approved TCCD serves as the authorization for further development and provides the information needed by curriculum developers to create the training materials for a course. Thus, careful attention must be paid to the detail, content, and structure of the TCCD. Volume I, Chapter 5 of this manual provides guidance on compiling the TCCD.

1.1. Description and Application of the TCCD. The TCCD is a collection of products which expresses in summary form, the content, structure, and essential management information for a course. Most of the information has already been developed; in the TCCD it is placed in a standard format for submittal. The TCCD consists of the following items:

- Front Matter
- Curriculum Outline of Instruction (COI)
- Annexes

> The content, structure, and essential management information contained in the TCCD is used to implement and manage the course. For this reason it must accurately reflect the final course and must be kept updated.

1.2. TCCD Components: The following is a description of each TCCD deliverable:

- Front Matter:

    - Cover page
    - Letter of promulgation
    - Table of contents
    - Foreword (if required)
    - Course data
    - Trainee data. Consists of the following:

        - Personnel physical requirements
        - Security clearance
        - Prerequisites
        - Obligated service
        - NOBC/NEC/MOS earned

- COI:

  - In the COI, Units and Lesson Topics consisting of learning objectives are displayed in the order they will be taught.
  - Volume I, Chapter 4 of this manual describes the development of the COI.

- Annexes:

  - TCCD annexes provide the resource requirements and time allocations for the training course.
  - Resource Requirements List (RRL). It lists all the resources required to conduct the course. See Volume I, Chapter 5, Section 2.3 of this manual for more details on the development of the RRL.
  - Course Master Schedule (CMS). The CMS and CMS Summary shall be developed in accordance with Volume I and Volume II, NAVEDTRA 135 (series), and Corporate Enterprise Training Activity Resource System (CeTARS).
  - Profile item-to-topic objective assignment chart. Abbreviated OAC for "objective assignment chart," this chart provides a cross reference between the Personnel Performance Profile (PPP) items and the corresponding Lesson Plan locations for presenting the PPP items, Learning Objectives, and test items. The OAC is essential to ensure that all PPP line items are taught to the Training Objective Statement (TOS) levels indicated in the Training Level Assignment (TLA).

1.3. Review and Approval. The Curriculum Control Authority (CCA) will review and approve all TCCD deliverables.

SECTION 2 – LETTER OF PROMULGATION

Upon completion of the Pilot Course, the CCA will authorize the use of the curriculum through a Letter of Promulgation. This authorization is a permanent part of the course audit trail. It is placed in the TCCD front matter immediately following the cover page. When the TCCD is submitted, a page marker is inserted where the Letter of Promulgation will later be placed.

Authorization to implement the course after the curriculum has been approved and all required resources are in place is the

responsibility of the Learning Center or Functional Commander.
See Chapter 6 of this Volume and NAVEDTRA 135 (series) for
additional information.

SECTION 3 - SURVEILLANCE

Each Course Curriculum Model Manager (CCMM), for courses
under their cognizance, will:

- Review TCCD for currency, adequacy, and accuracy whenever
  a course change or revision is undertaken.
- Review technical changes to hardware or documentation and
  evaluate them for impact on existing TCCD and curricula.
- Make recommendations and provide impact comments and/or
  draft TCCD for the CCA when appropriate changes are
  indicated for their courses.

> "Using Authoring Instruction Material (AIM) and linking
> resources, especially technical data, to content can
> drastically reduce curriculum surveillance time required
> when a resource is updated. AIM will flag very specific
> content items based on changes to linked resources such
> as technical documentation, learning objectives, Course
> Training Task List (CTTL) items, Lesson Plans, and
> Trainee Guides."

- The TCCD is a document that is utilized in PPP curriculum
  development (NAVEDTRA 131 (series)) and Task Based
  curriculum development. The following figure provides a
  comparison of TCCD Components in both types of curriculum
  development styles.

NAVEDTRA 130	NAVEDTRA 131
Three Main Parts	Three Main Parts
1. Front Matter	1. Curriculum Outline of Instruction (COI)
2. Curriculum Outline of Instruction	2. Profile item to Objective Assignment Chart
3. Annexes	3. Resource Requirement List (RRL)
Front Matter Components	COI Elements
1. Cover Page	1. Course Learning Objectives
2. Letter of Promulgation	2. Topic Learning Objectives
3. Forward (Not Required)	3. Curriculum Outline of Instruction
4. Table of Content	
5. Course Data	COI Describes four main areas
6. Trainee Data	1. Skills and knowledge acquired by trainee upon completion of course.
7. Security Clearance	2. Skills and knowledge acquired by trainee upon completion of topic.
8. Obligated Service	3. Organization of subject matter into specific units of instruction (Parts, Section, and Topics) and the sequence or order which the subject matter will be taught.
9. NOBC/NEC/MOS	4. Developers intent with respect to course and each unit of instruction.
Curriculum Outline of Instruction	Profile item to Objective Assignment Chart
Review NAVEDTRA 130 for guidelines and differences from info in the NAVEDTRA 131 Column	1. An administrative tool designed to reflect the coverage of PPP items within a curriculum
	2. Structured to correlate PPP item coverage to specific TLOs within a curriculum.
ANNEXES	3. Divided into Columns
1. RRL	a. TABLE column - Identifies each PPP table once per page, followed by "(Cont)" as appropriate.
2. Course Master Schedule (CMS)	b. ITEM column - Lists PPP items sequentially, starting with the 1-1 series and ending with the 2-2 series for each PPP table listed in the "TABLE" column.

NAVEDTRA 130	NAVEDTRA 131
Resource Requirement List (RRL)	Profile item to Objective Assignment Chart Cont.
Texts. List all text materials (e.g., Lesson Plan and Trainee Guide) to be used in the course	c. TOS column - Arranged so the sequence of TOS listing per profile item or sub-item is T0/, F1, T1, T2, T3 for knowledge categories, and O1, O2, P1, C1, C2 for skill categories, as appropriate
References. List in alphanumeric order, all reference documents used in the course	d. VOL column -Lists the volume where the TLO is located if the LP is a multivolume set; otherwise, no entry is made.
Equipment. Includes all equipment, special tools and test equipment.	e. PART column - Lists the part in which the TLO is found if the part number is different than the table number.
Films. Also includes videotapes and videodiscs	f. SECT and TOPIC columns – Specify the Section and Topic in which the PPP item or sub-item is covered
Graphics. List transparencies, wall charts, slides, photographs, power points, etc., and Interactive Courseware (ICW)	g. LRNG OBJ column - Specifies the TLO which relates to the PPP item or sub-item
Support materials. All instruction sheets NOT contained within a Trainee Guide, list instruction sheet number, title, and quantities required per class	h. TEST ITEM column - Optional, and relates test item number to Topic Learning Objective
Other: List, as required	Resource Requirement List (RRL)

STAGE THREE

CHAPTER 6

CURRICULUM AND SUPPORT MATERIALS

INTRODUCTION

Curriculum Materials include all materials required for the presentation of information and the development of skill. Support materials are instructional materials and other devices used to support instruction.

SECTION 1 - CURRICULUM CONTROL, DEVELOPMENT AND COORDINATION

1.1. Control of Curricula:

- Control of curricula will be accomplished by the Curriculum Control Authority (CCA) who assigns coordination, development, and support responsibilities to participants. This is to ensure that:

  - Curriculum materials are analyzed for accuracy and effectiveness
  - The need for course revisions or development of new curriculum materials is evaluated
  - Schedules for the development of curriculum materials reflect new equipment deliveries and Fleet training requirements

1.2. Development of Curriculum:

- The developer will usually be in the Learning Center (LC) and in some cases delegated to the Learning Site (LS) designated as Course Curriculum Model Manager (CCMM) for the course to be developed or revised.

  - For multi-sited courses, the CCMM has a responsibility to liaison with each teaching site to determine site-unique requirements and to solicit review of materials.
  - Coincident with the development of Lesson Plan (LP), Trainee Guide (TG), and Test Package, is the procurement of Resource Requirements List (RRL) items which are identified as part of the Training Course Control Documents (TCCD).
  - The CCMM is the interim review and approval agent for the development of training materials, up to the pilot convening of the course.
  - The CCMM is ultimately responsible to the CCA for the development of all curriculum materials.

- NAVEDTRA 135 (series) discusses the CCMM's roles and responsibilities in greater detail and should be reviewed before revising or developing instructional materials.

- The developer is responsible for incorporating into the curriculum all requirements residing in current instructions, such as incorporating safety details and developing a Testing Plan.

  - NAVEDTRA 135 (series) should be consulted to ensure all requirements are addressed.

- The developer will work with numerous entities both inside and outside the Navy to ensure that training materials are developed or acquired which meet accepted instructional standards and meet the development schedule.

  - Assistance in meeting these requirements and professional guidance in the development of effective training materials may be obtained from the Curriculum and Instructional Standards functional area or the Learning Standards Officer (LSO), where available. The role and responsibility of the curriculum and instructional standard functions are discussed in NAVEDTRA 135 (series).

- Surveillance of approved, on-line courses is the subject of Chapter 7 of this Volume.

1.3. Coordination with LS:

- Curriculum development for courses which are multi-sited and/or developed by agents other than the LS should involve all LSs at a minimum in the review of the curriculum materials.

  - The degree of LS involvement will be influenced by the approved Training Project Plan (TPP) milestones and CCA directions.
  - The developer should forward for review and comment major segments of the course as soon as they are available rather than leaving the review until the total course is developed.

- The LS should review the material for technical
  accuracy and any problems they might have in
  implementing the material as written. Review of
  material should be expedited and comments should be
  specific and include suggestions for correcting any
  errors or problems identified.
- LSs may be called upon to pilot the material
  developed, provide instructors to participate at other
  sites in piloting the material, and/or provide pilot
  monitors. (See Chapter 7 of this Volume for more
  information on pilots.)
- If multiple Functional Commanders are involved,
  resource requirements and other factors which impact
  on the implementation of the final course should be
  coordinated with each Functional Commander as soon as
  requirements are identified.

SECTION 2 - CURRICULUM MATERIALS DEVELOPMENT

2.1. Development and approval of the curriculum materials will
follow the events listed unless specifically waived by the CCA.

- Review management materials.

  - TPP. As soon as a firm requirement exists, a TPP will
    be submitted in accordance with NETCINST 1510.1
    (series) and NAVEDTRA 135 (series). Development of
    the course described in the TPP can proceed while
    awaiting TPP approval if authorized by the CCA.
  - Personnel Performance Profile (PPP)/TPS. The TPS will
    identify the PPP tables, individual line items, and
    the training level to which they will be taught. The
    PPP line items will form the core of the Lesson
    Topics.
  - TCCD. The approved TCCD will provide the Terminal
    Objectives and Enabling Objectives, course sequence by
    Unit and Lesson Topic, proposed test points, and
    resource requirements.

- Establish a development schedule which meets the
  Milestones approved in the TPP.

  - The sequence in which the material is developed must
    be dictated by each course's individual requirements,
    including such factors as lead time for VI/IMM or
    training device development; availability of technical
    documentation; appropriateness of existing materials,

and the number and experience of developers assigned
to the effort. The preferred sequence of training
materials development is:

- LP
- TG
- Test Package
- Support Material/Instructional Media Materials

- The schedule is an internal control document which
  should be monitored by the developer and the Learning
  Standards functional lead.
- Monitoring the schedule will lead to early
  identification of possible changes in the TPP
  Milestones. Changes in the TPP Milestones must be
  coordinated and approved by the CCA.

2.2. Review content and/or format requirements levied by the
CCA/CCMM in addition to those specified in this manual.

- If the developer is not experienced in application of the
  NAVEDTRA 130 (series) process, the CCA may require the
  developer to submit a sample of each type of curriculum
  material to be developed. This is referred to as a
  "Cross Section."
- The Cross Section and its contents will be specified by
  the CCA, if required.
- Complete development of draft curriculum and support
  materials.
- The LP places the instructional process in the sequence
  established by the TCCD. In the LP, the Topic Learning
  Objectives become discussion points, amplified as
  necessary to support the Course Learning Objectives.
  Methods and procedures for Lesson Plan development are
  contained in Volume I, Chapter 6 of this manual.
- Multiple Lesson Topics will normally be under development
  at one time. It is recommended that a single individual
  or team be given responsibility for developing a group of
  related Lesson Topics or Units.
- All Lesson Topic development should be a coordinated
  effort to ensure a smooth transition from Lesson Topic to
  Lesson Topic, Section to Section, and Part to Part.
- The TG is designed to support instruction. Most
  essential are Job Sheets to carry out skill objectives in
  both

practice and test situations. Directions for developing effective instruction sheets are found in Volume I, Chapter 7 of this manual.

- Tests measure the trainee's attainment of stated knowledge and skill objectives. Thus, tests are closely related to both the LP and the supporting TG Instruction Sheets. Procedures for developing knowledge and skill tests are contained in Volume I, Chapter 8 of this manual and additional guidance on the administration of a testing program is provided in NAVEDTRA 135 (series).

- Support material including Visual Information (VI) aids and Instructional Media Material (IMM) may actually be developed by personnel not part of the developer's command. This situation may increase the amount of coordination or require longer lead time.

  - Volume I, Chapter 9 discusses the coordination required to develop VI aids and IMM.
  - Other support material, such as training devices, is governed by their own instructions and will be coordinated with the CCA.
  - Procurement of technical manuals, textbooks, and government publications is governed by Supply System directives.
  - OPNAVINST 5290.3 (series), SECNAV 5870.4A, and NETCINST 3140.1 (series) defines the VI products exempt from production reporting requirements. Exemptions include graphics and overhead transparencies. Ensure all Copyright procedures are followed per previous instructions.

- All material should be reviewed by at least one Subject Matter Expert or other designated reviewer beside the developer.

- Reproduce copies of all curriculum materials (including paper copies of VI aids and IMM materials as practical) and forward to designate LSs for review and comment, as directed.

- Monitoring of the curriculum development process is accomplished by periodic In Process Reviews (IPRs).

  - IPRs are conducted for review of developmental products and to provide comments to the developer.
  - IPRs should be scheduled at intervals depending on the length and complexity of the development project.

- IPR participants include the CCA, LSO, and
  representatives from other LSs which will teach the
  course.
- Reviewers will ensure that developed curriculum
  materials comply with the management materials, are
  technically accurate, meet content requirements of
  NAVEDTRA 131 (series), Volume III, and comply with
  other format conventions specified for the course.
- If IPRs are not feasible, developer reproduces copies
  of all curriculum materials (including paper copies of
  IMM materials as practical) and forwards to the CCA
  and designated LSs for review and comment, as
  directed.

2.3. Review will be completed within the guidelines listed
below, plus 14 days mailing time, unless otherwise directed by
the CCA.

EXPECTED COURSE LENGTH	REVIEW TIME
Less than 3 weeks	30 Days
3 weeks to 8 weeks	60 Days
Greater than 8 weeks	90 Days

   FIGURE 6-1:   GUIDELINES FOR REVIEW OF CURRICULUM MATERIALS

2.4. Modify curriculum materials to reflect the changes
identified during review.

2.5. Recommend pilot date to CCA:

- Advise the CCA of readiness to pilot 90 days in advance.
  (See Chapter 7 of this Volume for additional guidance on
  pilot responsibilities.)
- CCA should not authorize a pilot until sufficient VI aids
  and IMM are on hand to evaluate their integration into
  the course.
- CCMM/LS will monitor the pilot course assigned by the
  CCA.
- Forward pilot course progress reports in accordance with
  Chapter 6 of this Volume.
- The LSO (or Quality Control Officer) at the pilot site
  should monitor the pilot.
- Red-line curriculum to incorporate proposed changes in
  the curriculum/support materials.

- CCA signifies approval of the curriculum or red-lined curriculum identified during the pilot by issuing a Letter of Promulgation.
- Authorize LSs (as appropriate) to use approved red-lined pilot curriculum prior to final curriculum.
- Actual implementation of the course or use of the red-lined curriculum if resources are affected must be coordinated with NETC and the LCs Functional Commander.

2.6. Incorporate curriculum material comments in accordance with approved recommendations of the Pilot Course Report.

2.7. Duplicate and distribute masters of the curriculum materials to assigned LSs along with sufficient VI aids and IMM to implement the course at each site.

- Duplicate and distribute curriculum materials to LSs with receipt card (OPNAV 5511/10). Track receipt cards.
- CCMM and LS perform surveillance on the final curriculum materials as described in Chapter 8 of this Volume.

SECTION 3 - CURRICULUM AND SUPPORT MATERIAL REVIEW AND APPROVAL

Curriculum and Support materials may be reviewed by the CCA.

- Usually the CCA review will occur at the end of the development process, but the CCA can require additional IPRs in which CCA, CCMM, LSO, LSs, or others as designated by the CCA participate.
- IPRs should be required for new course development and for revision of lengthy courses and pipeline courses.
- Review authorities will ensure that developed curriculum materials comply with management materials, are technically accurate, and meet the guidelines of NAVEDTRA 130 (series) and other requirements specified for the course.

SECTION 4 - SUMMARY

Each document produced during the curriculum development process should build and support all others. It is rare that only one part of the curriculum materials is being worked on at a time. It is therefore important that all personnel actively engaged in developing the training materials communicate and exchange material. Not only is the developer able to see how material supporting or building on his/her topic is being developed, but it serves as a review for content and accuracy.

STAGE FOUR/FIVE

CHAPTER 7

PILOT COURSE

INTRODUCTION

A pilot course is defined as the first full length course conducted at a Navy school by Navy instructors using the curriculum and supporting training materials prepared specifically for that course. The purpose is to validate the curriculum and materials, and to determine their effectiveness and course length. The Curriculum Control Authority (CCA) will determine those course(s) designated as pilot convening's. The pilot course process consists of the following elements:

- Preparation for pilot course convening
- Pre-pilot conference
- Pilot course convening and course monitoring
- Post-pilot conference
- Report of pilot course assessment

SECTION 1 - PREPARATION FOR PILOT COURSE CONVENING

The structure and conduct of a pilot course will depend to a great extent on the length of the course, class convening schedule, and the extent of approved curriculum materials and support materials available.

- A short course with infrequent class convening's will permit the conduct of a pilot and assessment of results, and incorporation of review comments prior to the next convening.
- A complex, lengthy course, or the necessity to accommodate class schedules, may dictate the use of a "rolling pilot," where data is gathered and fed back to the developer for incorporation, while the pilot continues for later sections or convenings.

  - Segments of the piloted materials must integrate into the rest of the course. That is, previous training must support the materials being piloted.
  - Temporary duty considerations preclude lengthy participation by support personnel outside the host Learning Site (LS). Use senior, qualified LS personnel as available, preferably personnel NOT directly involved in writing the piloted course materials.

- Have options available to utilize previously approved course materials if piloted segment produces abnormally high test failure rates by students in the pilot class.
- If the piloted segment of a course is acceptable, it should be left in place after pilot. However, final approval of course materials by the CCA should be reserved until all revised materials have been piloted and reported upon. Suggestions regarding the use of this training material include:

  - If corrections are relatively minor, continue to instruct from the red-line materials while corrections are being incorporated into a smooth copy.
  - If corrections result in re-writing or re-sequencing materials within Lesson Topics, return to the use of previously approved materials until corrections are completed. If time and resources permit, pilot the revised materials a second time.

1.1. Preparation for Pilot of New Courses. The following procedures apply to preparation for pilot of new courses:

- Determination of Pilot Course Convening Date. The Curriculum Control Model Manger (CCMM) will submit a proposed pilot course convening date to the CCA with copies sent to all other participating LS as soon as a projected completion date for training materials development is available.
- Readiness to Conduct Pilot Course. Not later than 90 days prior to the designated pilot course convening date, the LS scheduled to conduct the pilot is requested to assess and certify its readiness to conduct the pilot course. This readiness notification should be addressed to and developed in conjunction with the CCA. Copies should be transmitted to any other participating LS or other activities, and include the following elements:

  - A listing of present training material shortages and deficiencies which are projected to be corrected prior to the pilot course convening date.
  - The state of completion, installation, and operability of training devices and laboratories which support the pilot course should also be considered.

- A listing of training material shortages and deficiencies, if any, which are not expected to be corrected by the convening date, or for which delivery/correction dates cannot be determined. Include cognizant activity and estimated delivery/correction dates if known.
- A listing and assessment of any other factors which, in the judgment of the Commanding Officer, could adversely affect the validity of the pilot course as a comprehensive evaluation of all instructional elements. Instructor preparation time and the availability of students with the required prerequisites are among factors to be considered.
- An overall assessment of readiness to conduct the pilot course as scheduled. (Include status and completeness of the curriculum and supporting training materials, technical training equipment, General Purpose Electronic Test Equipment (GPETE), training devices, laboratories, Coordinated Shore Bases Allowance List (COSBAL) supply support onboard, etc.)
- If the scheduled date is not recommended, an alternate date should be proposed.

- Pilot Course Convening Approval. The CCA will evaluate the recommendations in the readiness report, approve a pilot course convening date, designate monitoring team members, and specify a due date for submittal of the Final (End of Course) Monitoring Progress Report.

  - This date will normally be 30 days after the estimated course completion date for courses less than 30 days in length, and 30 days after the estimated course completion date for courses 30 days or more in length.
  - The convening date approval letter distribution will include all addressees of the readiness report.

- Pre-Pilot Surveillance. After convening date approval and not later than 14 days prior to the approved pilot course convening date, the LS scheduled to conduct the pilot is requested to submit a message report if the pilot course should NOT be conducted on the approved date. This is an exception report which can be made after pilot convening date approval if the facts and assumptions contained in the original readiness report have significantly changed. Its purpose is to stimulate

timely recovery action if possible, and to notify pilot
course support activities before attendance plans are
finalized.

- Significant changes occurring in the two weeks
immediately preceding the pilot course convening date
should be reported to the CCA by telephone/electronic
mail.

**1.2. Pilot of Revised Courses Developed from Existing
Curricula**. For curriculum developed solely from previously
piloted, approved, and promulgated curricula, the following
procedures will be used to expedite curriculum development while
retaining an option to pilot when the conditions warrant:

- The first convening of the course will be conducted
using draft curriculum materials. The LS's course
supervisor will provide monitoring support for this
class.
- Within 30 days after course completion, the LS will
provide a synopsis of course supervisor and student
critique comments with a recommendation to either
continue development to final products, or conduct a
formal pilot.
- The CCA will select one of four options for the
curriculum materials:

- Approve as a final curriculum

- Approve curriculum for pilot, subject to incorporation
of designated comments. Continue to use for training,
no pilot required.
- Require a formal pilot.

- If a formal pilot is required, the LS comments will be
considered a draft curriculum review, and the normal
pilot process will be followed.

SECTION 2 - PRE-PILOT CONFERENCE

Shortly before the pilot course convening date, the
monitoring team chairman will convene the pre-pilot conference.
Its purpose is to plan the validation process, assign monitoring
team responsibilities consistent with the levels of
representation available, and discuss/resolve any outstanding
issues impacting the conduct of the pilot. The following should
be addressed:

- Assignment of monitors and respective responsibilities:

  - Status of management materials
  - Status of curriculum materials
  - Status of support materials
  - Status of applicable change recommendations
  - Identification of instructors
  - Status of pilot instructor's Lesson Plan personalization
  - Review of the Readiness to Pilot report or letter
  - Specification of Monitoring Report frequency and due dates
  - A tentative date for the post-pilot conference

- All problems and discrepancies should be identified and resolved so that a final determination can be made as to the suitability of conducting the pilot course.
- The chairman will distribute a summary of the agreements reached and responsibilities assigned during the pre-pilot conference.

2.1. Responsibilities and Functions of the Pilot Monitoring Team

- The pilot monitoring process is an evaluation of all training materials, both knowledge and performance, and it faithfully records in real-time all instructional presentations.

  - It is not the responsibility of the monitoring team to develop or revise curriculum material during the classroom/laboratory presentation.
  - If the monitoring team determines that the Learning Objectives (LO) are not satisfied, recommendations will be made to the CCA at the post-pilot conference and in the final report.
  - It is the responsibility of the CCA or Training Support Agent (TSA) to determine what action is necessary to accommodate the recommendations.

- The CCMM or LS conducting the pilot course will generally provide most of the monitoring team members from the instructional staff.
- It is evident that the greatest range of tasks are the responsibility of the course personnel at the host LS conducting the pilot course, with support from within by the LS course supervisor.

- To the maximum feasible extent, other LSs that will teach the course, or the developer if the material was not developed by the host LS, should provide assistance to the host command in the course monitoring effort.

2.2. The pilot course monitor(s) should be:

- Technically competent to provide the instructor technical assistance as required or capable of accessing a point of contact for technical assistance.
- Familiar with the development guidelines of NAVEDTRA 130 (series) and the management requirements established in NAVEDTRA 135 (series).
- Aware of the status and availability of all training materials associated with the particular curriculum.
- Familiar with approved and pending change recommendations to any training materials which could have an impact on the pilot course.
- Familiar with the objectives of the preliminary curriculum and approved training.
- The purpose of conducting a pilot course is to validate the curriculum and support materials, and to determine their effectiveness in attaining the course objectives.
- The role of the chairman is to coordinate and manage the project, and summarize the results in the final course monitoring report.
- The pilot course monitors serve as the primary judge of the adequacy of a new or revised course. In this role, notes and comments regarding observed problems are later amplified to provide the basis for recommending changes, completing Intermediate and Final Course Monitoring Reports, and, ultimately, in assessing the success or failure of the piloted course.
- The course monitor is provided with all curriculum materials and references while observing instruction. Addendum A, the Course Monitor Outline, can be used to note problem areas. A summary of all Course Monitor Outlines completed can thus provide a reference for daily and end of course critiques.
- Addendum B, the Course Monitor Time Log, is used to record the actual time spent on each lesson topic, and, in summary, provides the best estimate of total time required for the course.

2.3. The Chairman shall:

- Maintain physical custody of the master red-lined curriculum and support materials, ensuring all consensus/comments/recommendations of the course monitors are properly and accurately annotated.
- Chair and conduct critique sessions daily with the course monitors and incorporate comments into the master red-lined curriculum materials. Make the master red-line materials available to course monitors.
- Inform course monitors of the time and location for critiques.
- Conduct pre-presentation reviews of curriculum materials.
- Provide course monitors with presentation material that has been restructured by instructors in advance of presentation.
- Conduct and chair the scheduled post-pilot conference.
- Originate all Intermediate Pilot Course Monitoring Reports and the Final Pilot Course Monitoring Report.

2.4. Course Monitors shall:

- Attend pre-pilot conference.
- Attend post-pilot conference.
- Be present for all classroom and laboratory sessions.
- Comment as appropriate on the administrative aspects of the pilot course conduct, using the LS Administrative Review as a guideline (Addendum C).
- Comment as appropriate on curriculum, using the Course Monitor Outline as necessary.
- Maintain personal red-line of curriculum materials for use during critiques.
- Attend all critique sessions held to review presentations and resolve comments for incorporation into the master red-line.
- Attend all pre-presentation reviews of curriculum materials requested by the chairman.
- Accept and use for monitoring the modified curriculum materials supplied by the chairman.
- Participate in the development of Pilot Course Monitoring Reports.

2.5. The Course Monitoring Outline Sheets Addendum 6-A, are designed for use by course monitors and to serve as guides for noting subjects or items observed during the course monitoring

process that require comment. Typically, one sheet would be completed by each course monitor for each lesson topic, but this is flexible and should be amenable to the structure of the course.

SECTION 3 - PILOT COURSE CONVENING AND COURSE MONITORING

The course will be conducted and managed per the Lesson Plan (LP) and the management guidelines established in NAVEDTRA 135 (series).

- It is strongly recommended that the instructors not be the individuals who developed the material. The material should stand on its own. Often, when the writer is also the presenter, he will teach what he intended to have in the lesson topic and not necessarily the material which was actually written.
- Often the CCA or the CCMM will establish as a policy that any student recommended for dis-enrollment from a pilot course will be reassigned to another course teaching the old curriculum. This procedure eliminates the perception that the trainee is being penalized by problems which may be inherent in the material being piloted. NAVEDTRA 135 (series) provides additional information on student management. It and CCA/CCMM policies should be reviewed.

3.1. Pilot monitors shall:

- Attend critique sessions held at the completion of each instructional day to review presentations and resolve comments for incorporation into the master red-line.
- Unless otherwise directed by the chairman, assemble in assigned classroom 15 minutes prior to the start of scheduled instruction. Course monitors will return to the classroom or laboratory in sufficient time to ensure they are in place when class breaks are over.
- Not participate in classroom/laboratory activities or aid the instructors in any way, nor will they discuss their comments or recommendations with the instructors during classroom/laboratory presentations. In no case shall course monitors conduct business with trainees present.

SECTION 4 - POST-PILOT CONFERENCE

At the completion of the pilot, the pilot monitors, CCA, and representatives of the activity which developed the material will meet to discuss their observations and comments on all instructional material, the course management procedures, and the facilities.

> Course Monitoring Outline Sheets are usually prepared for each Lesson Topic, but the frequency of preparation is based on whatever is appropriate to have meaningful data to discuss at the end-of-day critique and for input to the master red-line LP, Trainee Guide (TG), support material, and tests.

The Course Monitoring Outline Sheets, Time Log, and the Facilities Administrative Review Checklist will be reviewed to ensure all issues are addressed. Appropriate corrective action will be recommended.

SECTION 5 - REPORT OF PILOT COURSE ASSESSMENT

- The chairman, unless otherwise designated, will prepare the Monitoring Report. The report will be divided into the following sections:

  - Course Identification
  - Course Administration
  - Course Validation
  - Instructional Accuracy/Adequacy
  - Minority Report (If none, so state)
  - Other (Optional)

- Long courses may require interim pilot course monitoring reports. The final course monitoring report should contain all interim reports, as applicable.
- If the course is to be multi-sited, any problem at these sites which will impair the implementation of the course will be discussed under the appropriate heading in the report. The site should be clearly identified to distinguish it from the pilot site.

5.1. Course Identification. The course identification section will contain the following data on the pilot course:

- Title of the command conducting the pilot
- Course Title without abbreviations
- Course Identification Number (CIN) if assigned
- Inclusive dates of the pilot
- Name, rate, and rank of all monitors/representatives and the commands or activities they represent

5.2. Course Administration. The course administration section will contain the following data on the pilot course:

- Facilities. Major deficiencies impairing training and recommended for corrections. If corrective action requires additional resources it should be noted. The LS should prepare separate documentation to their Functional Commander for resources in accordance with NAVEDTRA 135 (series).
- Safety. Personnel and equipment deficiencies impairing training and recommended corrective action. Any safety problems which occur during the pilot will be reported in accordance with NAVEDTRA 135 (series) and NETCINST 5100.1 (series) as well as noted in the monitoring report.
- Security. Any deficiency impairing training, such as inadequate stowage for classified materials, or affecting the trainees assigned to the course, such as delays in obtaining necessary clearances.
- Allocation. Course and/or topic time, student-to-instructor ratios, and effectiveness of classroom-to-laboratory time allocations with recommendations when times deviate more than 10 percent.
- Critique Sheets. Summarize comments from the outline sheets.

5.3. Curriculum Validation. The curriculum validation section will contain the following information on the pilot course:

- LP. Statements as to attainment of objectives, recommendations, instructor/trainee preparation, major deficiencies, etc.
- TG. Statements as to the adequacy and organization of all instruction sheets.
- Equipment/Tools. Comments on the quantity/quality of equipment and tools, their adequacy in support of objectives, and trainee's ability to use.
- Support Materials. Comments on the type, quality, quantity, and adequacy to support objectives.

- Instruction. Comments on the quality of instruction in the attainment or lack of attainment of objectives.
- Testing. Comments on the testing strategy, test design, test items, and quantity to support uninterrupted training.

5.4. Instructional Accuracy/Adequacy. This section will address the accuracy, adequacy, sequencing, and overall effectiveness of the training in attaining the stated Course Learning Objectives.

5.5. Minority Report. This section provides an opportunity for monitors to provide any alternatives to the recommendations presented in the previous sections. If no minority comments are put forth, it should be noted.

5.6. Other. If any other items should be brought to the CCA's attention but do not fit under any of the other sections, they would be addressed here.

SECTION 6 - PILOT COURSE CORRECTIONS AND ADJUSTMENTS

Based on the findings and comments recorded during the pilot course, it is usually necessary to make corrections and adjustments to the training materials prior to approval and implementation.

- Detailed direction is provided to the developer on what corrections and adjustments are to be made.
- Limitations:

  - Any modification to training materials which does not affect the course mission statement or require additional resources may be corrected as a result of the pilot. The following are examples of such corrections:

    - Revise objectives as necessary to support the course Mission.
    - Add, delete, or re-sequence lesson topics.
    - Adjust lesson topic periods and ratios.
    - Add or delete support material such as transparencies, wall charts, and instruction sheets.

  - Any modification to training materials which does affect the course mission statement or require additional resources may not be corrected without

modification and approval of the Training Project Plan
(TPP). The following are examples of such
corrections:

- Work outside the course mission statement (expand or
  reduce scope).
- Change in minimum/maximum class size, established
  course length, Average on Board (AOB).
- Require additional resources:

  - Equipment
  - Facilities
  - Personnel
  - Funding

SECTION 7 - IMPLEMENTATION PROCESS

Implementation takes place after the pilot course has been
conducted and the corrections and adjustments to the training
materials indicated by the pilot course have been accomplished.

- CCA Approval:

  - Authorization to use curriculum materials is granted
    by the CCA through a Letter of Promulgation. This
    approves the curriculum for use in support of training
  - Functional Commander Approval
  - Where the CCA and the Functional Commander are
    different, the Functional Commander authorizes
    implementation of the course when the material has
    been approved by the CCA and all required resources
    are in place

- CCMM Responsibilities:

  - Ensure all sites are ready to train.
  - Accommodate site-unique training considerations.
  - Distribute all curriculum material masters to all LSs.
  - Distribute support materials consistent with the TPP
    or as directed by the CCA/Functional Commander.
  - Submit initial Corporate Enterprise Training Activity
    Resource System (CeTARS) and Catolog of Navy Training
    Courses (CANTRAC) data for new or revised courses.

- CCMM and LS(s) Responsibilities: Certify instructors to
  teach the course and supervise personalization of LPs.

- Establish administrative and support functions with:

  - Learning Standards Office (LSO)
  - Training Support Center (TSC)/Training Support Detachment (TSD)
  - Medical (if appropriate)
  - PSA/PSD (if appropriate)

- Distribute training materials
- Update CeTARS and CANTRAC if necessary
- Order consumables and other support materials. This should be coordinated with CCA and Functional Commander to avoid duplication of effort or funding conflicts
- Follow special procedures established for certification of instruction of high risk courses

SECTION 8- SUMMARY

After implementation, responsibility for curriculum maintenance is assigned to the CCMM and course evaluation begins. All future modifications to course materials fall under the guidance of Volume III, Chapter 8 of this manual. Course management is carried out by all sites per NAVEDTRA 135 (series).

EVALUATION

CHAPTER 8

EVALUATION, SURVEILLANCE, AND TRAINING MATERIALS MODIFICATION

SECTION 1 - IMPLEMENTATION

The training materials will be implemented by the Course
Curriculum Model Manager (CCMM) with the cooperation of the
Learning Sites (LSs) teaching the course. NAVEDTRA 135 (series)
should be used as a guide for the management of the course. It
specifies the audit trail to be maintained for each curriculum
development/revision and what records are to be maintained on
all courses.

SECTION 2 - EVALUATION

- The central concept behind evaluation is the constant
  improvement of training materials through a process that:

  - Provides a means of keeping training materials current
    and accurate
  - Is responsive to changing training requirements and
    equipment/documentation alterations
  - Is open to innovation

- Evaluation consists of a number of programs which either
  individually or collectively evaluate the instructional
  materials, the instruction, the instructors, and the
  trainees. NAVEDTRA 135 (series) describes the various
  programs used to evaluate the effectiveness and
  efficiency of the total training program. The portion of
  the evaluation program which concentrates on the
  curriculum is organized around two major functions,
  surveillance, and training materials modification.

SECTION 3 - SURVEILLANCE

Every Learning Site (LS) is responsible for monitoring each
course it instructs and proposing changes to the CCMM as needed.
NAVEDTRA 135 (series) describes in greater detail the
responsibilities of LSs and CCMMs.

- Surveillance involves:

  - Monitoring hardware documentation and changes for
    impact on existing training materials
  - Detecting errors or deficiencies in existing training
    materials and initiating the necessary corrective
    action

> "Using Authoring Instructional Material (AIM) and linking resources, especially technical data, to content can drastically reduce the surveillance time required. AIM will flag very specific content items based on changes to linked resources such as technical documentation, learning objectives or Course Training Task List (CTTL) items."

- Training materials modification is the result of surveillance and involves actual alterations to training materials. These alterations range from Interim Changes, such as the correction of clerical errors and insertion of titles, to revisions in course length, the course mission statement, or a shift from one instructional strategy to another.

SECTION 4 - SUPPORT COORDINATION AND CONTROL

- For courses supported by a Training Support Agency (TSA), both the CCMM and TSA will be responsible for the surveillance of, and the development of, modification to assigned training materials.
- For courses life-cycle supported by a TSA, the TSA shall introduce technical changes to curriculum necessitated by changes in tactical equipment, documentation, maintenance policy, or training-unique equipment.
- For all courses not life-cycle supported by a TSA, the CCMM will perform surveillance and introduce other modifications to curricula.

SECTION 5 - CATEGORIES OF MODIFICATIONS TO TRAINING MATERIAL

5.1. Interim Change. A minor modification to training materials correcting editorial, typographical or technical errors, teach ability, safety or urgent Type Commander promulgated subjects. An Interim Change does not require a TPP.

- An Interim Change will not alter the course mission statement, terminal/enabling objectives, change the length of the course, or require additional resources.
- The Commanding Officer/Officer in Charge of each LS teaching a course may approve Interim Changes made by the LS for the curriculum it teaches. Interim Changes related to safety will be implemented and reported to the CCMM immediately.

- Interim Changes not related to safety will be reported to the CCMM within five working days.
- The CCMM will incorporate Interim Changes in the next promulgated change to the curricula.
- If the Interim Change was generated due to site-unique circumstances, the CCMM will evaluate the Interim Change and upon concurrence will issue an approval letter. CCMM approval shall specify that the change is unique to the submitting site and will not be included in future changes promulgated by the CCMM.
- If the CCMM does not concur with an Interim Change as submitted, the issue will be forwarded to the Curriculum Control Authority (CCA) for resolution.
- Copies of the Interim Change will be forwarded to the CCA and TSA as appropriate. Figure 8-1 is a sample letter for forwarding an Interim Change.

```
From:   Commanding Officer, Learning Site
To:     Commanding Officer, Course Curriculum Model Manager

Subj:   INTERIM CHANGE TO COURSE A-234-5678, COMMERCIAL UTILITY
        CARGO VEHICLE (TYPE A) OPERATION AND MAINTENANCE

Ref:    (a) NAVEDTRA 130 (series)

1.  Discrepancies and/or errors have been encountered in the
Lesson Plan, and the following pen and ink Interim Changes
have been made:

    a.  In Volume 1, on page 4-4-5, change the part of item 3a
which reads:

    (5) Steering/Wheels/Tires
    (6) Brakes

     to read

    (5) Steering/Wheels/Tires/Tubes/Rims
    (6) Brakes/Shoes

2.  This interim Change is per reference (a) and has been
implemented at this command; request dissemination to other
LSs teaching this course.

                              (LS COMMANDING OFFICER)


Distribution:
Other LSs
```

FIGURE 8-1: INTERIM CHANGE LETTER

5.2. Change. A modification to training materials that does
not affect the course mission, does not increase course length,
and does not require additional resources. A Training Project
Plan (TPP) is not required.

- The need for a change may be identified by either the
  training activity or the CCMM. Changes will be approved
  and promulgated by the CCMM.
- Each Change will incorporate all outstanding interim
  changes.

- If a conflict exists between a CCMM and another LS over change, the matter will be referred to the CCA for resolution.
- For TSA-monitored courses, the TSA will monitor changes to ensure technical adequacy and accuracy.
- Formatting, production, and distribution of CCMM-originated changes shall be accomplished by the CCMM.
- Copies of all changes will be distributed to each LS instructing the course, the CCA, and TSA (for TSA-supported courses).
- Changes will be issued by letter as shown in Figure 8-2.

```
From:   Commanding Officer, Course Curriculum Model Manager
To:     Commanding Officer, Learning Site

Subj:   CHANGE 2 TO COURSE A-234-5678, COMMERCIAL UTILITY CARGO
        VEHICLE(TYPE A) OPERATION AND MAINTENANCE

Ref:    (a) NAVEDTRA 130 (series)

Encl:   (1) Lesson Plan Change Pages
        (2) Trainee Guide Change Pages

1.  Incorporate enclosure (1) into the Lesson Plan for subject
course.  Incorporate enclosure (2) into the subject course
Trainee Guide.  This change is in accordance with reference
(a) and incorporates Interim Changes 2-1 through 2-16 and is
approved for use.  Subsequent Interim Changes will be
reflected in Change 3.



                                    (CCMM Commanding Officer)

Distribution:
Learning Center
Learning Sites
```

FIGURE 8-2:   CHANGE APPROVAL LETTER

5.3. Technical Change. A Technical Change addresses any change to tactical or training-unique equipment or documentation originating in the TSA's parent material agency and affecting promulgated curricula. A Technical Change does not require a TPP.

- A Technical Change may or may not affect learning objectives. It does not affect course mission, course length, or resources. The TSA develops and forwards a Technical Change to the CCMM.
- The Technical Change will consist of smooth change pages to the curricula, with sufficient copies to distribute to all activities teaching the affected course.

5.4. Revision

- A modification to the course mission statement, an increase in course length, or training material modification that requires additional resources. A Revision always requires a TPP.

  - A Revision incorporates previous modifications and supersedes preceding editions of the training materials.
  - Revisions require the development and submission of a TPP for approval. The level of approval for a TPP for revisions will vary based on the project. Refer to NETCINST 1510.1 (series) and NAVEDTRA 135 (series) and OPNAV Memorandum for Distribution 7000 N1 127189 of 15 September 2008 for information on the approval of TPPs. Volume I, Chapter 2 of this manual provides guidance for developing a TPP.
  - Revisions will be prepared by a developer and approved by the CCA.
  - The amount of change to the curriculum will vary between revisions. Revisions may consist of partial replacements of curriculum and thus, may not require a reprint of the entire curriculum; or the revision may be so extensive that the complete curriculum must be reprinted.
  - Revisions to be developed by a TSA to TSA-monitored courses shall be undertaken only with TSA concurrence and acceptance of funding responsibility for development and review of the Revision.
  - A developer (LS or TSA) shall be assigned for an approved Revision effort for in-house projects. This is usually the CCMM. The development process described in Volume I, appropriately modified by CCA and TSA concurrence, shall be applied to Revisions.

- The intent of training materials modifications is to allow expedient updating of curricula while still maintaining consistent instructional standards throughout the NETC.

Modifications to courses will not be undertaken solely to change format.

- Figure 8-3 describes the originator, promulgation authority, reproduction and distribution activity, and reviewing authority for Interim Changes, Changes, Technical Changes, and Revisions to curricula.

Type of Modification	INTERIM CHANGE	CHANGE	TECHNICAL CHANGE	REVISION
Originator	LS	CCMM	TSA	Per TPP
Pre Promulgation Review	None	CCMM	None	Per TPP
Promulgation Authority	CCMM	CCMM	CCMM	CCA
Reproduction/ Distribution	CCMM/ LS	CCMM/ LS	Repro: TSA Dist: CCMM	Per TPP

FIGURE 8-3: MODIFICATION APPROVAL/REVIEW MATRIX

SECTION 6 - INTERNAL EVALUATION

Responsibility for internal course evaluation lies with both the CCMM and with all LS teaching the course:

- Internal Evaluation shall be conducted per NAVEDTRA 135 (series).
- Internal Evaluation will be done by all TFs for each course taught with the objective of ensuring that:

- The course training materials match the CCMM master materials.
- The Resource Requirements List (RRL) requirements for curriculum, audio-visual materials, and references are met.
- Evaluation of all hazardous laboratory situations to eliminate or minimize training procedures that have potential for risk to the trainee (NETCINST 5100.1 (series) refers). A review of applicable safety regulations and precautions to ensure they are included in appropriate areas throughout the curriculum. This includes Training Time Out (TTO), Drop-on-Request (DOR) and Pre-Mishap Plan per NETCINST 5100.1 (series) and NAVEDTRA 135 (series).

- The Technical Training Equipment (TTE), tools, materials, and equipment supporting the course are safe, serviceable, accurately configured, and meet RRL requirements.
- The instructional environment is adequate and conducive to learning.
- All instructors are certified per NAVEDTRA 135 (series) and Training Facility (TF) directives.
- Testing and measurement of trainee achievement are in compliance with NAVEDTRA 135 (series) and applicable Functional Commander directives.
- Feedback action items on course content are followed up. Determine that all approved modifications have been incorporated into the curriculum.
- Available external evaluation information is used to assess the course in terms of meeting current and projected fleet requirements.

- Instructional Staff evaluation. To ensure the quality of the instructional staff, all TFs will have an instructional staff evaluation program with feedback and discrepancy correction tracking components.

SECTION 7 - EXTERNAL EVALUATION

- There are two purposes for External Evaluation:

  - To determine whether the skills taught are job-specific.
  - To determine whether the course graduates can perform those skills in the work environment.

- Sources of External Feedback. External feedback data can be obtained from several sources. All TFs are to use all available data sources in determining the effectiveness of their training courses. The following are examples of some sources:

  - The course graduates and their immediate supervisors are two separate sources of information on the effectiveness of the existing courses. Evaluators must be aware of, and take into consideration, any interim training received by the graduates before reporting to their work station. Evaluators must also consider any time lapse between graduation from the course of instruction and the actual assignment to their work station.

- Technical Audit of a course provides valuable data on the technical strengths and weaknesses existing in the course content and supporting technical documentation and equipment.
- New instructors reporting for duty from the Fleet are an excellent source of information of what tasks are being performed on the job. New instructors should be considered as the equivalent of job incumbents, for purposes of providing external feedback, for up to six months after leaving the working environment.
- Contacts with Fleet personnel in the area, Fleet personnel who are attending other courses at the training facility, or others who have knowledge of course graduate performance can provide valuable inputs, comments, and recommendations.
- Training facility liaison with the Fleet Operational Chain of Command is a useful source of training feedback.
- Training effectiveness as measured by direct Fleet evaluation, testing, and assessment conducted by TSAs, is also a valid source of external feedback.

SECTION 8 - TRAINING MATERIALS MODIFICATION (TMM)

The rules governing TMM for interim change, technical change, change, and revision are found in this chapter. The process for creating new materials for inclusion in training materials are covered in Volume I of this manual. This section describes Change and Revision as applied to PPP/TPS based curriculum, and the effect a modification in one curriculum component can have on related components.

SECTION 9 - TMM ACTIONS

- The interrelationship of Personnel Performance Profile (PPP)/TPS components is shown by the arrows in figure 8-4:

- The most frequent cause of changes in curriculum materials occur in the LP, based on updates to technical documentation. For example, a modification to technical documentation will initiate a change in the LP. This would also cause a change in any Trainee Guide instruction sheets using the reference.
- A modification to technical documentation could also result in a modification to the text of one or more PPP line items. This would initiate a PPP table

change, which would feed through to all components using the affected line item(s).

- A change made to the Lesson Plan (LP) to resequence the Discussion Points (DP) within a lesson topic would alter the sequence of instruction sheets used in the topic, causing a change in the Trainee Guide (TG). The Topic Learning Objectives (TLOs) may also be affected, depending on the scope of the modification. If TLOs are affected, the Curriculum Outline of Instruction (COI) in the Training Course Control Documents (TCCD) must be updated to reflect the Change.
- A Change is indicated on curriculum materials by a sequential number; Change 1.
- A Revision to a course re-examines all course components, and is usually the result of an analysis of the job tasks associated with an equipment, subsystem, or system. Essentially, the rules for course development apply to a Revision and the course is put together in a new form using the existing Course Identification Number (CIN).
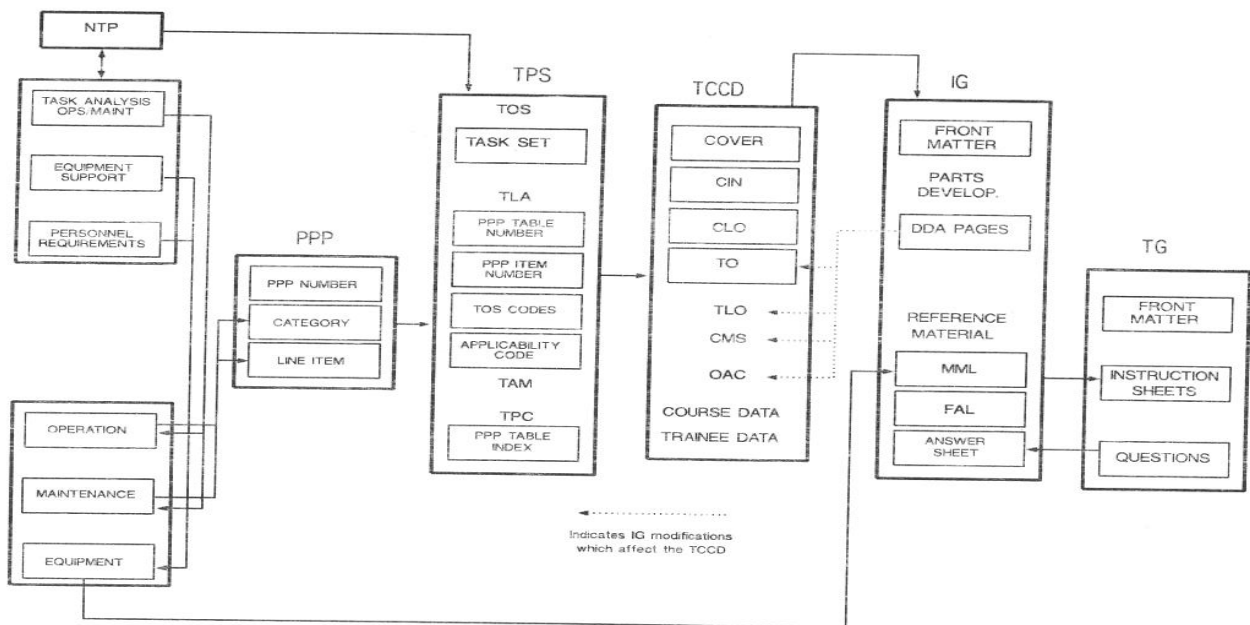

FIGURE 8-4: INTERRELATIONSHIP OF PPP/TPPS COMPONENTS

- A Revision is indicated on curriculum materials by a letter; Revision A. A Revision incorporates previous Changes; the Change number is reset to "0" and start over again.

9.1. PPP Tables: The following will help you determine the difference between a Change and Revision to a PPP table:

- CHANGE:

  - A PPP table Change is most commonly tied to a modification to technical documentation or a modification of equipment terminology.
  - Applies to approved tables only.
  - Can only add line items or sub-items at the end.
  - Can delete line items (Shows up as "Deleted").
  - Cannot renumber existing line items.
  - Can reword existing line items.
  - Adding a Change does not cancel prior Change inputs; only increments the Change number.
  - Submitted to custodian CCA listed in TRDB. Custodian CCA is responsible for forwarding approved Change to NETC.

- REVISION:

  - PPP table Revisions are infrequent. PPP table Revisions generally indicate that the job tasks defined by the table have been analyzed and a restructuring of the table is necessary to reflect new developments.
  - Applies to approved tables only.
  - Can essentially rebuild a table, saving only the title and PTN.
  - All prior Changes are incorporated into a Revision. Change number resets to "0".
  - Delete(s) are gone, line items are renumbered, and can be resequenced.
  - Submitted to custodian CCA listed in TRDB. Custodian CCA responsible for forwarding approved Revision to NETC.

9.2. Training Path System (TPS): The following will help you determine the difference between a Change and Revision to a TPS:

- CHANGE:

  - Basically, any alteration to the TPS which does not fall under the conditions of a Revision (below) is a Change. For example, a Change in a PPP table results in some added and deleted line items. This will be reflected in the TLA for the Changed PPP table, and

carried forward into the TLO for any line items used in a course.
- Applies to approved TPS only.
- In response to PPP table Change, can only add line items or sub-items at the end.
- In response to PPP table Change, can delete line items (Shows up as "Deleted").
- Cannot renumber existing line items.
- Adding a Change does not cancel prior Change inputs; only increments the Change number.
- Submitted to custodian CCA listed in Training Requirement Data Base (TRDB). Custodian CCA responsible for forwarding approved Change to NETC.

- REVISION:

  - A TPS Revision can be introduced at the TPS directly (for example, by a modification of a Navy Training Plan) or come from a Revision to one or more PPP tables. If the TPS supports more than one course, the impact of the TPS Revision must be coordinated by the CCA with other users.
  - Applies to approved TPS only.
  - Can essentially restructure a TPS, saving only the title and TPS Number.
  - All prior Changes are incorporated into a Revision. Change number resets to "0".
  - (Delete) s are gone, Training Level Assessments (TLA) line items are renumbered.
  - Submitted to custodian CCA listed in TRDB. Custodian CCA responsible for forwarding approved Revision to NETC.

SECTION 10 - LESSON PLAN/TRAINEE GUIDE

In terms of frequency of occurrence, Changes to the LP and TG are by far the most common. This is related to the updating of technical documentation, and constant improvements in support materials such as adding, deleting, or changing transparencies, inclusion of new cites in the LP Related Instructor Activity (RIA) column, updating the Fault Applicability List (FAL), etc. Most modifications to the LP/TG have no outside effects. However, it is within the realm of Change that the subjects within the course can be re-sequenced, or times reallocated. Re-sequencing subjects or reallocating times will require a

Change in the TCCD COI and Course Master Schedule. The TCCD is a management document and must accurately reflect the course as taught.

- CHANGE:

  - Can only Change an approved LP/TG.
  - Cannot make any modifications which will affect the Course Learning Objectives (CLO).
  - Can modify the Hazard Awareness Notice. This will carry through to the TG.
  - Can add, delete, combine, and reword DPs as long as TLOs for a topic are accomplished.
  - Can add, delete, reword, update cites in the RIA column. Any cites involving instruction sheets must be followed up with a Change to affected instruction sheet(s) in the TG.

    NOTE: The Trainee Guide as a bound volume is not given Change numbers or Revision letters. Only the instruction sheets show Change and Revision.

  - Can resequence the order of presentation.
  - Can reallocate times between class and labs. Cannot increase or decrease total course time.

- REVISION:

  - Only an approved course can be opened for Revision.
  - A Revision requires an approved TPP. When a course is revised there are likely to be major modifications to the LP/TG. Essentially, all elements of the LP/TG can be modified under the existing CIN.
  - Prior Changes are incorporated into a Revision. The Change number resets to "0".

SECTION 11 - TRAINING COURSE CONTROL DOCUMENT (TCCD)

- The Letter of Promulgation, placed in the TCCD, is issued for new development and Revisions. A Change does not require a Letter of Promulgation; the Change number will be indicated only on the affected curriculum materials.
- As a management document, the TCCD must reflect the current status of the course. This includes the:

  - COI
  - Course Master Schedule

- Course Data
- Trainee Data

SECTION 12 - SUMMARY

Evaluation, surveillance, and training materials modification are performed for the life cycle of all courses. Every TF is responsible for monitoring each course it teaches and proposing modifications to the CCMM as needed. This chapter and NAVEDTRA 135 (series) describe the responsibilities of TFs and CCMMs for these functions.

ADDENDUM A

COURSE MONITORING OUTLINE SHEET

COURSE MONITORING OUTLINE SHEET MONITOR

NAME_____REPRESENTING_____

DATE_____ UNIT/LESSON TOPIC NUMBER_____

LESSON TOPIC_____

CLASSROOM/LAB ROOM NUMBER OR LOCATION_____

1. Were LESSON PLAN components accurate and in correct format?

    a. Front Matter

    b. Learning Objectives

    c. Discussion Points

    d. Related Instructor Activity

    e. Instructor/Trainee Preparation

    f. Other

2. Were TRAINEE GUIDE components accurate and in correct format?

    a. Front Matter

    b. Outline Sheet

    c. Information Sheets

    d. Assignment Sheets

    e. Job Sheets

    f. Diagram Sheets

    g. Problem Sheets

3. Equipment/Tools:

    a. Was equipment correct and available in sufficient quantity?

    b. Were tools correct and available in sufficient quantity?

4. Support Materials/Instructional Media Material (IMM):

    a. Was support material relevant to the lesson topic?

    b. Is the special emphasis provided by support material necessary?

    c. Are IMM clear and legible?

5. Instructional Accuracy/Adequacy:

    a. Is the content accurate?

    b. Is the material presented in a logical sequence?

    c. Does the lead-in information motivate the student to pursue the material?

    d. The teaching-learning activities encourage productive learning?

    e. Is the material written in a manner to allow maximum student participation?

    f. Is there opportunity for review and practice?

    g. Does the material effectively teach the behaviors specified in the Learning Objectives?

    h. General Information Accuracy:

        (1) Are abbreviations, terms, and symbols accurate?

        (2) Are operational characteristics, capabilities, and limitations accurate?

        (3) Is documentation accurate?

    i. Physical information accuracy:

        (1) Is information on major and associated components accurate?

        (2) Is information on displays, controls, and indicators accurate?

    j. Functional Information accuracy:

(1) Is information on functional operation accurate?

(2) Is information of controls and indicators accurate?

(3) Is information on computer software, operational, and maintenance programs accurate?

k.   Interface Information accuracy:

(1) Is information on physical interface accurate?

(2) Is information on functional interface accurate?

l.   Operational Information:

(1) Is information on initialization accurate?

(2) Is information on normal operational tasks accurate?

(3) Is information on casualty/degraded modes accurate?

(4) Is information on securing/shutdown accurate?

(5) Is information on personnel and equipment safety accurate?

m.   Maintenance Information:

(1) Is information on preventive maintenance procedures accurate?

(2) Is information on operational tests and diagnostic programs accurate?

(3) Is information on malfunction indicators accurate?

(4) Is information on fault isolation procedures accurate?

(5) Is information on alignment, calibration, and adjustment accurate?

(6) Is information on disassembly, repair, and reassembly accurate?

(7) Is information on tools and test equipment accurate?

(8) Is information on post-repair procedures accurate?

(9) Is information on personnel and equipment safety accurate?

(10) Is information on maintenance policy accurate?

6. Instruction:

   a. Did the instructor(s) demonstrate adequate preparation?

   b. Did the instructor(s) demonstrate appropriate instructional methods and techniques?

   c. Depth of coverage:

      (1) Was the depth of coverage appropriate in relation to the objectives?

      (2) Was the depth of coverage appropriate in relation to the experience level of the trainees?

   d. Did the instructor(s) demonstrate appropriate questioning techniques?

   e. Was the instructor(s) presentation pertinent to Discussion Points (DPs)?

7. Testing:

   a. Are tests given which cover too much or too little material?

   b. Do tests adequately measure trainee comprehension of learning objectives?

   c. Are performance tests indicative of actions performed on the job?

   d. Are sufficient test items and alternative forms of tests available?

   e. Are all trainees tested under the same conditions?

   f. Are performance tests similar to, but not the same as, job assignments?

g. Is test security maintained?

h. Test Data:

(1) Number taking test_____

(2) Number passing test_____

(3) High score_____

(4) Low score_____

(5) Median score_____

(6) Minimum passing score_____

(7) What remedial options (if any) were utilized?

ADDENDUM B

COURSE MONITORING TIME LOG

COURSE TITLE _____   CIN _____

CLASSROOM/LAB NUMBER OR LOCATION _____

MONITOR NAME _____ REPRESENTING _____

DATE	PART/SECT/ TOPIC	CLASSROOM		LABORATORY		NOTES
		Hr. Sched.	Actual	Hr. Sched.	Actual	

COMMENT REQUIRED IF ACTUAL TIME VARIES BY +/-10% FROM SCHEDULED
TIME.

ADDENDUM C

LEARNING SITE ADMINISTRATIVE REVIEW

CHECKLIST

LEARNING SITE
ADMINISTRATIVE REVIEW
CHECKLIST

MONITOR NAME_____REPRESENTING_____

DATE_____ UNIT/LESSON TOPIC NUMBER_____

LESSON TOPIC_____

CLASSROOM/LAB ROOM NUMBER OR LOCATION_____

1. FACILITIES:

    a. Is the learning process aided by environmental conditions with respect to (Yes/No/Comments):

        (1) Temperature?

        (2) Lighting?

        (3) Space?

        (4) Absence of distractions?

    b. Are the laboratory facilities:

        (1) Properly arranged?

        (2) Supportive of skill objective accomplishment?

    c. Are Electronic classrooms operational?

        (1) Daily Percentage availability/reliability?

2. PERSONNEL AND EQUIPMENT SAFETY (Yes/No/Comments):

    a. Are safety precautions:

        (1) Adequately identified?

        (2) Prominently displayed?

        (3) Stressed in instructional presentations?

        (4) Enforced when performing tasks?

b. Are existing hazards adequately identified?

c. Is standard safety equipment available for use?

3. SECURITY:

a. Are trainees advised of proper security measures?

b. Is the dissemination of classified material or information on a strict "need to know" basis?

c. Is the use of classified material confined to classroom or laboratory?

d. Is classified material accurately and prominently marked?

e. Is access to classroom or laboratory controlled during classified presentations or discussions?

4. ALLOCATIONS:

a. Are trainee-to-instructor ratios considered optimum within?

   (1) Classroom?

   (2) Laboratory?

b. Is classroom-to-laboratory time allocation effective?

5. CRITIQUE SHEETS:

a. Are critique sheets used?

b. Do responses on critique sheets indicate the trainees have achieved knowledge and skill requirements?

ADDENDUM D

CURRICULUM DEVELOPER AID

FOR

SYSTEMS

PERSONNEL PERFORMANCE PROFILE

TABLES

PERSONNEL PERFORMANCE PROFILE (PPP) TABLES

- Obtain the following resources:

    - Technical documentation
    - Subject Matter Experts (SMEs)
    - Job Task Inventory
    - E/SS/System PPP (SPPP) Model Statements Table 2

1. Start the development of a SPPP by obtaining two blank pieces of paper, then:

    a. On one blank piece of paper put the heading "Page A." Immediately below this heading, write "2. System Skills." Below the heading "2. System Skills" write "2-1. Operation."

    b. On the other blank piece of paper put the heading "Page B." Immediately below this heading write "1. System Knowledge." Below the heading "1. System Knowledge" write "1-5 Operational Description."

2. Is there any technical documentation required for use with the system?

    a. If yes, at the bottom of page B write "1-7. Documentation" and select line item 1-7-1 from the Model Statement table and write it on Page B below the heading "1-7 Documentation".

    b. If no, continue to step 3.

3. Are there any actions a human must take to make this system perform the purpose it was designed for?

    a. If yes, select line item 2-1-1 from the Model Statement table and write it below the heading "2-1. Operation" on Page A. Select line item 1-5-1 from the Model Statement table and write it below the heading "1-5. Operational Description" on Page B. Select line item 1-5-2 from the Model Statement table and write it on Page B below the last line item listed.

    b. If no, write "No operation required below""2-1. Operation" on Page A and write "No operation required" on Page B below the heading "1-5. Operational Description," then go to step 28b(2).

4. Are there any actions that must be performed on this system prior to operating it?

   a. If yes, select sub-item 2-1-1a from the Model Statement table and write it on Page A below line item 2-1-1. Select sub-item 1-5-2a from the Model Statement table and write it on Page B below line item 1-5-2.

   b. If no, go to step 7.

5. Are there any routine pre-operational procedures, which must be performed prior to the operational procedures?

   a. If yes, select sub-item 2-1-1a (1) from the Model Statement table and write it on Page A below sub-item 2-1-1a. Select sub-item 1-5-2a (1) from the Model Statement table and write it on Page B below sub-item 1-5-2a.

   b. If no, continue to step 6.

6. Does this system have to be installed into a specific location prior to operation?

   a. If yes, select sub-item 2-1-1a (2) from the Model Statement table and write it on Page A below the last item/sub-item listed. Select sub-item 1-5-2a (2) from the Model Statement table and write it on Page B below the last item/sub-item listed.

   b. If no, continue to step 7.

7. Does this system have to be assembled prior to operation?

   a. If yes:

      (1) Select sub-item 2-1-1a (3) from the Model Statement table and write it on Page A below the last item/sub-item listed. Select sub-item 1-5-2a (3) from the Model Statement table and write it on Page B below the last item/sub-item listed.

      (2) Select sub-item 2-1-1b from the Model Statement table and write it on Page A below the last item/sub-item listed. Select sub-item 1-5-2b from the Model Statement table and write it on Page B below the last item/sub-item listed.

b.   If no, select sub-item 2-1-1b from the Model Statement table and write it on Page A below the last item/sub-item listed. Select sub-item 1-5-2b from the Model Statement table and write it on Page B below the last item/sub-item listed.

8.   Are there any procedures that must be performed after the system has been operated?

a.   If yes, select sub-item 2-1-1c from the Model Statement table and write it on Page A below the last item/sub-item listed. Select sub-item 1-5-2c from the Model Statement table and write it on Page B below the last item/sub-item listed.

b.   If no, continue to step 9.

9.   Are there any critical operator actions required to keep the system operating properly?

a.   If yes, select line item 2-1-2 from the Model Statement table and write it on Page A below the last item/sub-item. Select line item 1-5-3 from the Model Statement table and write it on Page B below the last item/sub-item.

b.   If no, go to step 15.

10. Does this system have any alarms?

a.   If yes, select line item 1-5-3 part (i) from the Model Statement table and incorporate it into line item 1-5-3 on Page B.

b.   If no, continue to step 11.

11. Does this system have any indicators?

a.   If yes, select line item 1-5-3 part (ii) from the Model Statement table and incorporate it into line item 1-5-3 on Page B.

b.   If no, continue to step 12.

12. Does this system have any displays?

a.   If yes, select line item 1-5-3 (iii) from the Model Statement table and incorporate it into line item 1-5-3 on Page B.

b.   If no, continue to step 13.

13.   Does this system have any readout?

     a.   If yes, select line item 1-5-3 part (iv) from the Model Statement table and incorporate it into line item 1-5-3 on Page B.

     b.   If no, continue to step 14.

14.   Does this system have any printouts or type outs?

     a.   If yes, select line item 1-5-3 part (v) from the Model Statement table and incorporate it into line item 1-5-3 on Page B.

     b.   If no, continue to step 15.

15.   Does this system have specific casualty modes of operation?

     a.   If yes, select line item 2-1-3 part (i) from the Model Statement table and write it on Page A below the last line item/sub-item listed.   Select line item 1-5-4 part (i) from the Model Statement table and write it on Page B below the last line item/sub-item listed.

     b.   If no, continue to step 16.

16.   Does this system have a specifically designated degraded mode of operation?

     a.   If yes, select line item 2-1-3 part (ii) from the Model Statement table and write it on Page A.   Incorporate it with any other part of line item 2-1-3 previously selected.   Select line item 1-5-4 part (ii) from the Model Statement table and write it on Page B.   Incorporate it with any other part of line item 1-5-4 previously selected.

     b.   If no, continue to step 17.

17.   Does this system have a specifically designated abnormal mode of operation?

     a.   If yes, select line item 2-1-3 part (iii) from the Model Statement table and write it on Page A.   Incorporate it with any other part of line item 2-1-3 previously selected.   Select line

item 1-5-4 part (iii) from the Model Statement table and write it on Page B. Incorporate it with any other part of line item 1-5-4 previously selected.

    b. If no, continue to step 18.

18. Does this system have a designated not full mission capable mode of operation?

    a. If yes, select line item 2-1-3 part (iv) from the Model Statement table and write it on Page A. Incorporate it with any other part of line item 2-1-3 previously selected. Select line item 1-5-4 part (iv) from the Model Statement table and write it on Page B. Incorporate it with any other part of line item 1-5-4 previously selected.

    b. If no, continue to step 19.

19. Is this system a type of computer which produces tapes, or disks?

    a. If yes, select line item 2-1-4 from the Model Statement table and write it on Page A below the last line item/sub-item listed.

    b. If no, go to step 24.

20. Must these tapes, or disks, be interpreted to support system operation?

    a. If yes, select line item 1-5-5 part (i) from the Model Statement table and write it on Page B below the last line item/sub-item listed.

    b. If no, continue to step 21.

21. Must the function of these tapes, or disks, be understood to support system operation?

    a. If yes, select line item 1-5-5 part (ii) from the Model Statement table and write it on Page B below the last line item/sub-item listed. Incorporate it with any other part of line item 1-5-5 previously selected.

    b. If no, continue to step 22.

22. Must the use of these tapes, or disks, be understood to support system operation?

    a. If yes, select line item 1-5-5 Part (iii) from the Model Statement table and write it on Page B below the last line item/sub-item listed. Incorporate it with any other part of line item 1-5-5 previously selected.

    b. If no, continue to step 23.

23. Must the format of these tapes, or disks, be understood to support system operation?

    a. If yes, select line item 1-5-5 Part (iv) from the Model Statement table and write it on Page B below the last item/sub-item listed. Incorporate it with any other part of line item 1-5-5 previously selected.

    b. If no, continue to step 24.

24. Is there any data logging requirements involved with the operation of this system?

    a. If yes, select line item 2-1-5 from the Model Statement table and write it on Page A below the last line item/sub-item listed. Select line item 1-5-6 from the Model Statement table and write it on Page B below the last line item/sub-item listed.

    b. If no, go to step 28.

25. Are there specific methods that must be followed to meet data logging requirements?

    a. If yes, select line item 1-5-6 Part (i) from the Model Statement table and incorporate it on Page B with the previously selected part of line item 1-5-6.

    b. If no, continue to step 26.

26. Are there specific types of data to be logged to support data logging requirements?

    a. If yes, select line item 1-5-6 Part (ii) from the Model Statement table and incorporate it on Page B with the previously selected parts of line item 1-5-6.

    b. If no, continue to step 27.

27. Is knowledge of the disposition of logged data required to support data logging requirements?

    a. If yes, select line item 1-5-6 Part (iii) from the Model Statement table and incorporate it on Page B with the previously selected parts of line item 1-5-6.

    b. If no, continue to step 28.

28. Are there acceptance tests which must be performed when this system is operated?

    a. If yes, select line item 2-1-6 from the Model Statement table and write it on Page A below the last line item/sub-item listed. Select line item 1-5-7 from the Model Statement table and write it on Page B below the last line item/sub-item listed. Select line items 2-1-7 and 2-1-8 from the Model Statement table and write it on Page A below the last line item/sub-item listed. Select line items 1-5-8 and 1-5-9 from the Model Statement table and write it on Page B below the last line item/sub-item listed. Below the last line item/sub-item listed on Page A write "2-2. Maintenance" Below the last line item/sub-item listed on Page B write "1-6. Maintenance Description" Below the maintenance description heading on Page B write out line item 1-6-1 from the Model Statement table.

    b. If no:

        (1) Select line items 2-1-7 and 2-1-8 from the Model Statement table and write it on Page A below the last line item/sub-item listed. Select line items 1-5-8 and 1-5-9 from the Model Statement table and write it on Page B below the last line item/sub-item listed.

        (2) Below the last line item/sub-item listed on Page A write "2-2. Maintenance." Below the last line item/sub-item listed on Page B write "16. Maintenance Description." Below the maintenance description heading on Page B write out line item
1-6-1 from the Model Statement table.

29. Is any special tool unique to this system used during either preventive or corrective maintenance?

    a. If yes, select line item 2-2-1 Part (i) from the Model Statement table and write it on Page A below the Maintenance

heading. Select line item 1-6-2 Part (i) from the Model
Statement table and write it on Page B below the last line
item/sub-item listed.

b. If no, continue to step 30.

30. Is any test equipment unique to this system used during
preventive or corrective maintenance?

a. If yes, select line item 2-2-1 Part (ii) from the Model
Statement table and write it on Page A below the Maintenance
heading. Incorporate it with any other parts of line item 2-2-1
previously selected. Select line item 1-6-2 Part (ii) from the
Model Statement table and write it on Page B below the last line
item/sub-item listed. Incorporate it with any other part of
line item 1-6-2 previously selected.

b. If no, continue to step 31.

31. Does this system have required preventive maintenance
procedures?

a. If yes, select line 2-2-2 from the Model Statement table
and write it on Page A below the last line item/sub-item listed
Based on the Preventive Maintenance System in use for this
system, select line item 2-2-2 Part (i), 2-2-2 Part (ii) or
2-2-2 Part (iii) and incorporate it into the previously selected
part of line item 2-2-2 on page A. Select line item 1-6-3 from
the Model Statement table and write it on Page B below the last
line item/sub-item listed.

b. If no, go to step 34.

32. Are there any records that must be kept for preventive
maintenance?

a. If yes, select line item 1-6-3 Part (i) from the Model
Statement table and write it on Page B below the last line
item/sub-item listed. Incorporate it with any parts of line
item 1-6-3 previously selected.

b. If no, continue to step 33.

33. Are there any reports which must be made for preventive
maintenance?

a. If yes, select line item 1-6-3 Part (ii) from the Model Statement table and write it on Page B below the last line item/sub-item listed. Incorporate it with any parts of line item 1-6-3 previously selected.

b. If no, continue to step 34.

34. Are there any alignment procedures for this system?

a. If yes, select line item, 2-2-3 Part (i) from the Model Statement table and write it on Page A below the last line item/sub-item selected. Select line item 1-6-4 Part (i) from the Model Statement table and write it on Page B below the last line item/sub-item listed.

b. If no, continue to step 35.

35. Are there any adjustment procedures for this system?

a. If yes, select line item 2-2-3 Part (ii) from the Model Statement table and write it on Page A below the last line item/sub-item listed. Incorporate it with any parts of line item 2-2-3 previously selected. Select line item 1-6-4 Part (ii) from the Model Statement table and write it on Page B below the last line item/sub-item listed. Incorporate it with any parts of line item 1-6-4 previously selected.

b. If no, continue to step 36.

36. Are there any calibration procedures for this system?

a. If yes, select line item 2-2-3 Part (iii) from the Model Statement table and write it on Page A below the last line item/sub-item listed. Incorporate it with any parts of line item 2-2-3 previously selected. Select line item 1-6-4 Part (iii) from the Model Statement table and write it on Page B below the last line item/sub-item listed. Incorporate it with any parts of the line item 1-6-4 previously selected.

b. If no, continue to step 37.

37. Are there any operational tests performed during preventive or corrective maintenance for this system?

a. If yes, select line item 2-2-4 Part (i) from the Model Statement table and write it on Page A below the last line

item/sub-item listed. Select line item 1-6-5 Part (i) from the Model Statement table and write it on Page B below the last line item/sub-item listed.

    b.   If no, continue to step 38.

38.   Are there any diagnostic programs used during preventive or corrective maintenance for this system?

    a.   If yes, select line item 2-2-4 Part (ii) from the Model Statement table and write it on Page A below the last line item/sub-item listed. Incorporate it with any parts of line item 2-2-4 previously selected. Select line item 1-6-5 Part (ii) from the Model Statement table and write it on Page B below the last line item/sub-item listed. Incorporate it with any parts of line item 1-6-5 previously selected.

    b.   If no, continue to step 39.

39.   Were either Part (i), or Part (ii) of line item 1-6-5 selected?

    a.   If yes, select line item 1-6-5 Part (iii) from the Model Statement table and incorporate it in the parts of line item 1-6-5 previously listed on Page B. Select line item 2-2-5 from the Model Statement table and write it on Page A below the last line item/sub-item listed. Select line item 1-6-6 from the Model Statement table and write it on Page B below the last line item/sub-item listed.

    b.   If no, select line item 2-2-5 from the Model Statement table and write it on Page A below the last line item/sub-item listed. Select line item 1-6-6 from the Model Statement table and write it on Page B below the last line item/sub-item listed.

40.   Are there fault isolation procedures contained in the technical documentation for this system?

    a.   If yes, select line item 2-2-6 from the Model Statement table and write it on Page A below the last line item/sub-item listed. Select line item 1-6-7 from the Model Statement table and write it on Page B below the last line item/sub-item listed.

    b.   If no, continue to step 41.

41. Does the technical documentation for this system provide documented fault isolation procedures that cover all possible faults?

    a. If yes, continue to step 42.

    b. If no, select line item 2-2-7 from the Model Statement table and write it on Page A below the last line item/sub-item listed. Select line item 1-6-8 from the Model Statement table and write it on Page B below the last line item/sub-item listed.

42. Are there any procedures which must be performed after the repair of this system?

    a. If yes, select line item 2-2-9 from the Model Statement table and write it on Page A below the last line item/sub-item listed. Select line item 1-6-10 from the Model Statement table and write it on Page B below the last line item/sub-item listed. Select line items 2-2-10 and 2-2-11 from the Model Statement table and write it on Page A below the last line item/sub-item listed. Select line items 1-6-11 and 1-6-12 from the Model Statement table and write it on Page B below the last line item/sub-item listed. Number all line items on Page A sequentially, starting with number 2-1-1 for operational skills and 2-2-1 for maintenance skills. Number all line items on Page B sequentially, starting with numbers 1-5-1 for line items in the operational description and 1-6-1 for line items in the maintenance description.

    b. If no, select line items 2-2-10 and 2-2-11 from the Model Statement table and write it on Page A below the last line item/sub-item listed. Select line items 1-611 and 1-6-12 from the Model Statement table and write it on Page B below the last line item/sub-item listed. Number all line items on Page A sequentially, starting with number 2-1-1 for operational skills and 2-2-1 for maintenance skills. Number all line items on Page B sequentially, starting with numbers 1-5-1 for line items in the operational description and 1-6-1 for line items in the maintenance description.

43. On a blank piece of paper write the heading "1. System Knowledge." On the same paper write "1-1. General" below the heading. This paper will be referred to as Page 1. On page 1, below the sub-heading, write line item 1-1-1 from the Model Statement table. Number this line item 1-1-1. On page 1, below line item 1-1-1, write line item 1-1-2 from the Model Statement table. Number this line item 1-1-2. Write out the necessary

sub-items as required. These are identified sequentially by small letters (a, b, c, etc).

44. Are there abbreviations unique to this system?

    a. If yes, select line item 1-1-3 Part (i) from the Model Statement table and write it on Page 1 below the last line item/sub-item listed.

    b. If no, continue to step 45.

45. Are there terms unique to this system?

    a. If yes, select line item 1-1-3 Part (ii) from the Model Statement table and write it on Page 1 below the last line item/sub-item listed. Incorporate it into any other parts of line item 1-1-3 previously selected.

    b. If no, continue to step 46.

46. Are there symbols unique to this system?

    a. If yes, select line item 1-1-3 Part (iii) from the Model Statement table and write it on Page 1 below the last item/sub-item listed. Incorporate it into any other parts of line item 1-1-3 previously selected. Select line item 1-1-4 from the Model Statement table and write it on Page 1 below the last line item/sub-item listed.

    b. If no, select line item 1-1-4 from the Model Statement table and write it on Page 1 below the last line item/sub-item listed.

47. Does this system have different models?

    a. If yes, select line item 1-1-5 from the Model Statement table and write it on Page 1 below the last line item/sub-item listed. Select line item 1-1-6 from the Model Statement table and write it on Page 1 below the last line item/sub-item listed. Ensure all line items listed on Page 1 are numbered sequentially starting with line item 1-1-1. On a blank piece of paper write the following heading: "1-2. Physical Description." This paper will be referred to as Page 2. Select line item 1-2-1 Part (i) from the Model Statement table and write it on Page 2 below the heading.

b. If no, select line item 1-1-6 from the Model Statement table and write it on Page 1 below the last line item/sub-item listed. Ensure all line items listed on Page 1 are numbered sequentially starting with line item 1-1-1. On a blank piece of paper write the following heading: "1-2. Physical Description." This paper will be referred to as Page 2. Select line item 1-2-1 Part (i) from the Model Statement table and write it on Page 2 below the heading.

48. Do the subsystems of this system have specific nomenclature?

    a. If yes, below line item 1-2-1 on Page 2 list out all the subsystems that make up the system. These will make up the sub-items to line item 1-2-1. They are identified sequentially by small letters (a, b, c, etc.). Select line item 1-2-1 Part (ii) from the Model Statement table and write it on Page 2 incorporating it into any other part of line item 1-2-1 previously selected.

    b. If no, continue to step 49.

49. Is an understanding of the physical appearance of the major and/or associated components, equipments, or subsystems required?

    a. If yes, select line item 1-2-1 Part (iii) from the Model Statement table and write it on Page 2, incorporating it into any other part of line item 1-2-1 previously selected.

    b. If no, continue to step 50.

50. Do the major and/or associated components, equipments, or subsystems have reference designators?

    a. If yes, select line item 1-2-1 Part (iv) from the Model Statement table and write it on Page 2, incorporating it into any other part of line item 1-2-1 previously selected.

    b. If no, continue to step 51.

51. Is an understanding of the location of the major and/or associated components, equipments, or subsystems required?

    a. If yes, select line item 1-2-1 Part (v) from the Model Statement table and write it on Page 2, incorporating it into any other part of line item 1-2-1 previously selected.

b. If no, continue to step 52.

52. Is an understanding of the construction features of the major and/or associated components, equipments, or subsystems required?

　　a. If yes, select line item 1-2-1 Part (vi) from the Model Statement table and write it on Page 2, incorporating it into any other part of the line item 1-2-1 previously selected.

　　b. If no, continue to step 53.

53. Does this system have any displays?

　　a. If yes, select line item 1-2-2 Part (i) from the Model Statement table and write it on Page 2 below the last line item/sub-item listed.

　　b. If no, continue to step 54.

54. Does this system have any controls?

　　a. If yes, select line item 1-2-2 Part (ii) from the Model Statement table and write it on page 2 below the last line item/sub-item listed. Incorporate it with any other part of line item 1-2-2 previously selected.

　　b. If no, continue to step 55.

55. Does this system have any indicators?

　　a. If yes, select line item 1-2-2 Part (iii) from the Model Statement table and write it on Page 2 below the last line item/sub-item listed. Incorporate it with any other parts of line item 1-2-2 previously selected.

　　b. If no, continue to step 56.

56. Do the displays, controls, or indicators have reference designators?

　　a. If yes, select line item 1-2-2 Part (iv) from the Model Statement table and write it on Page 2 below the last line item/sub-item listed. Incorporate it with any other parts of line 1-2-2 previously selected.

b.   If no, continue to step 57.

57.   Do the displays, controls, or indicators have specific positions?

     a.   If yes, select line item 1-2-2 Part (v) from the Model Statement table and write it on Page 2 below the last line item/sub-item listed.   Incorporate it with any other part of line item 1-2-2 previously selected.

     b.   If no, continue to step 58.

58.   Do the displays, controls, or indicators have specific colors?

     a.   If yes, select line item 1-2-2 Part (vi) from the Model Statement table and write it on Page 2 below the last line item/sub-item listed.   Incorporate it with any other part of line item 1-2-2 previously selected.

     b.   If no, continue to step 59.

59.   Do the displays, controls, or indicators have specific locations?

     a.   If yes, select line item 1-2-2 Part (vii) from the Model Statement table and write it on Page 2 below the last line item/sub-item listed.   Incorporate it with any other parts of line item 1-2-2 previously selected.   Ensure the two line items on Page 2 are numbered 1-2-1 and 1-2-2.   On a blank piece of paper write the following heading: "1-3. Functional Description."   This paper will be referred to as Page 3.

     b.   If no, ensure the two line items on Page 2 are numbered 1-2-1 and 1-2-2.   On a blank piece of paper write the following heading: "1-3. Functional Description."   This paper will be referred to as Page 3.

60.   Is this system a computer or complex electro-mechanical device with various control circuits?

     a.   If yes, select line item 1-3-1 (Part B) from the Model Statement table.   Write the statement on Page 3 immediately below the heading and label it 1-3-1.   Select the appropriate terms from the statement and incorporate them into a single statement on Page 3 with the selected Model Statement.   Then go to step 65.

b.   If no, select line item 1-3-1 (Part A) from the Model
Statement table.   Write the statement on Page 3 immediately
below the heading and label it 1-3-1.

61.   Does this system have specific methods of control?

    a.   If yes, select line item 1-3-1 Part (i) from the Model
Statement table and write it on Page 3, incorporating it into
the part of line item 1-3-1 previously selected

    b.   If no, continue to step 62.

62.   Is an understanding of signal flow within this system
required?

    a.   If yes, select line item 1-3-1 Part (ii) from the Model
Statement table and write it on Page 3, incorporating it into
the parts of line item 1-3-1 previously selected

    b.   If no, continue to step 63.

63.   Does this system operate in a specific sequence?

    a.   If yes, select line item 1-3-1 Part (iii) from the Model
Statement table and write it on Page 3, incorporating it into
any other parts of line item 1-3-1 previously selected.

    b.   If no, continue to step 64.

64. Does this system have any indications that it is operating
in various methods/modes, etc?

    a.   If yes, select line item 1-3-1 Part (iv) from the Model
Statement table and write it on Page 3, incorporating it into
any other parts of line item 1-3-1 previously selected.
Immediately below the last part of line item 1-3-1 listed, list
out the subsystems which make up the system.   These will be sub-
items to line item 1-31.   They are identified by sequential
small letters (a, b, c, etc.).

    b.   If no, immediately below the last part of line item
1-3-1 listed, list out the subsystems which make up the system.
These will be sub-items to line item 1-31.   They are identified
by sequential small letters (a, b, c, etc.).

65. Does this system have functional loops within it allowing
for proper operation?

     a. If yes, select line item 1-3-2 from the Model Statement
table and write it on Page 3 below the last line sub-item
listed. Review line item 1-3-2 from the Model Statement table
and select the appropriate terms. Incorporate them into a
single statement with line item 1-3-2 on Page 3.

     b. If no, continue to step 66.

66. Does this system have any controls?

     a. If yes, select line item 1-3-3 Part (i) from the Model
Statement table and write it on page 3 below the last line
item/sub-item listed.

     b. If no, continue to step 67.

67. Does this system have any indicators?

     a. If yes, select line item 1-3-3 Part (ii) from the Model
Statement table and write it on Page 3 below the last line
item/sub-item listed. Incorporate it with any other part of
line item 1-3-3 previously listed.

     b. If no, continue to step 68.

68. Do the displays, controls, or indicators have any specific
positions?

     a. If yes, select line item 1-3-3 Part (iii) from the Model
Statement table and write it on Page 3 below the last line
item/sub-item listed. Incorporate it with any other parts of
line item 1-3-3 previously selected.

     b. If no, continue to step 69.

69. Do the controls or indicators of this system have specific
conditions?

     a. If yes, select line item 1-3-3 Part (iv) from the Model
Statement table and write it on Page 3 below the last line
item/sub-item listed. Incorporate it with any other parts of
line item 1-3-3 previously selected.

     b. If no, continue to step 70.

70. Do the displays, controls, or indicators have specific colors?

     a. If yes, select line item 1-3-3 Part (v) from the Model Statement table and write it on Page 3 below the last line item/sub-item listed. Incorporate it with any other parts of line item 1-3-3 previously selected.

     b. If no, continue to step 71.

71. Is this system a computer or other type of device that is programmable?

     a. If yes, select line item 1-3-4 from the Model Statement table and write it on Page 3 below the last line item/sub-item listed

     b. If no, go to step 73a(2).

72. Do the programs associated with this system have specific numbers?

     a. If yes, select line item 1-3-4 Part (i) from the Model Statement table and write it on Page 3, incorporating it into the part of line item 1-3-4 previously selected.

     b. If no, continue to step 73.

73. Does the use of any associated programs impose any type of constraints on operational or maintenance procedures?

     a. If yes:

          (1) Select line item 1-3-4 Part (ii) from the Model Statement table and write it on Page 3, incorporating it into the parts of line item 1-3-4 previously selected.

          (2) Number the line items on Page 3 sequentially, beginning with number 13-1. On a blank piece of paper write the following heading "1-4. Interface Description." On page 4 below the heading write line item 1-4-1 Part (i) from the Model Statement table.

     b. If no, number the line items on Page 3 sequentially, beginning with number 1-31. On a blank piece of paper write the

following heading "1-4. Interface Description." On page 4 below the heading write line item 1-4-1 Part (i) from the Model Statement table.

74. Is an understanding of the physical appearance of the physical interface required?

    a. If yes, select line item 1-4-1 Part (ii) from the Model Statement table and write it on Page 4, incorporating it into the part of line item 1-4-1 previously selected.

    b. If no, continue to step 75.

75. Does the physical interface of this system have reference designators?

    a. If yes, select line item 1-4-1 Part (iii) from the Model Statement table and write it on Page 4, incorporating it into the parts of line item 1-4-1 previously selected.

    b. If no, continue to step 76.

76. Does the physical interface of this system have specific locations?

    a. If yes, select line item 1-4-1 Part (iv) from the Model Statement table and write it on Page 4, incorporating it into the parts of line item 1-4-1 previously selected. Immediately below the last part of line item 1-4-1 listed, list out the physical interface and related external equipment which make up the equipment, subsystem, or system. These will be sub-items to line item 1-4-1. They are identified by sequential small letters (a, b, c, etc.). Select line item 1-4-2 from the Model Statement table and write it on Page 4 below the last line item/sub-item selected.

    b. If no, immediately below the last part of line item 1-4-1 listed, list out the physical interface and related external equipment which make up the equipment, subsystem, or system. These will be sub-items to line item 1-4-1. They are identified by sequential small letters (a, b, c, etc.). Select line item 1-4-2 from the Model Statement table and write it on Page 4 below the last line item/sub-item selected.

77. Are there any electrical interfaces between this system and any other equipment, subsystem, or system?

a. Yes, select sub-item 1-4-2a from the Model Statement table and write it on Page 4 below line item 1-4-2.

b. If no, continue to step 78.

78. Are there any electronic interfaces between this system and any other equipment, subsystem, or system?

a. If yes, select sub-item 1-4-2b from the Model Statement table and write it on Page 4 below line item 1-4-2 or sub-item 1-4-2a if it was previously selected.

b. If no, continue to step 79.

79. Are there any pneumatic interfaces between this system and any other equipment, subsystem, or system?

a. If yes, select sub-item 1-4-2c from the Model Statement table and write it on Page 4 below line item 1-4-2 or any sub-item of line item 1-4-2 previously selected.

b. If no, continue to step 80.

80. Are there any hydraulic interfaces between this system and any other equipment, subsystem, or system?

a. If yes, select sub-item 1-4-2d from the Model Statement table and write it on Page 4 below line item 1-4-2 or any sub-item of line item 1-4-2 previously selected.

b. If no, continue to step 81.

81. Are there any mechanical interfaces between this system and any other equipment, subsystem, or system?

a. If yes, select sub-item 1-4-2e from the Model Statement table and write it on Page 4 below line item 1-4-2 or any sub-item of line item 1-4-2 previously selected. Include sublevel (1) or (2) of this sub-item as appropriate.

b. If no, continue to step 82.

82. Place all the pages of this draft PPP in the following order:

(1) Page 1
(2) Page 2

(3) Page 3
        (4) Page 4
        (5) Page B
        (6) Page A

83. Transfer the information from the hand-written pages to the
final PPP Table forms. Review the PPP Table for completeness
and accuracy.

     a. Refer to Table 4 as an example of a completed System PPP
Table

     PERSONNEL PERFORMANCE PROFILE FOR MOBILE CONSTRUCTION
     BATTALION VEHICLES - DEPLOYED

     TABLE S1037

     MOBILE CONSTRUCTION BATTALION VEHICLES – DEPLOYED

     1 JANUARY 1986

     SYSTEM MODIFICATION RECORD

     None

     NEW DESIGN - DRAWING NUMBER

     None

     S1037-1/S1037-2

     Table 4. Example System PPP Table Cover Page

TABLE 4: EXAMPLE SYSTEM PPP TABLE

ITEM No.	KNOWLEDGE/SKILL
	TABLE S1037. Mobile Construction Battalion Vehicles - Deployed (System).
1.	SYSTEM KNOWLEDGE
1-1.	GENERAL
1-1-1.	State the purpose of the Mobile Construction Battalion Vehicles - Deployed system.

1-1-2.	State that the Mobile Construction Battalion Vehicles - Deployed system consists of the following subsystems including the function of each.
	
	     a. General Utility Vehicles
	     b. Tanked Vehicles
	     c. Earth Moving Vehicles
	     d. Ancillary Vehicles
	     e. Accessory Equipments

1-1-3.	Define the abbreviations, terms, and symbols used with the Mobile Construction Battalion Vehicles - Deployed system.
1-1-4.	State the operational characteristics and capabilities of the Mobile Construction Battalion Vehicles - Deployed system in terms of the parameters and limitations as listed in the applicable technical documentation.
1-1-5.	Describe the differences between the various models of the Mobile Construction Battalion Vehicles - Deployed system.
1-2.	PHYSICAL DESCRIPTION

1-2-1.	Describe all subsystems or major equipments of the Mobile Construction Battalion Vehicles Deployed system. Include the name, nomenclature, physical appearance, reference designation, location, and construction features of each.
	
	     a. General Utility Vehicles
	     b. Tanked Vehicles
	     c. Earth Moving Vehicles
	     d. Ancillary Vehicles
	     e. Accessory Equipments

1-2-2.	Describe controls, indicators, and displays directly associated with the Mobile Construction Battalion Vehicles - Deployed system. Include name, reference designation, positions, locations, and colors of each.

TABLE 4: EXAMPLE SYSTEM PPP TABLE (CONT'D)

TABLE S1037. Mobile Construction Battalion Vehicles - Deployed (System).	
ITEM No.	KNOWLEDGE/SKILL

1-2-2.
(Cont.)
	a. General Utility Vehicles
	    b. Tanked Vehicles
	    c. Earth Moving Vehicles
	    d. Ancillary Vehicles
	    e. Accessory Equipments

1-3.	FUNCTIONAL DESCRIPTION

1-3-1.	Describe how the Mobile Construction Battalion Vehicles - Deployed system works (functional operation). Include, when applicable, the methods of control, operational modes, inputs, and outputs of each.
	
	    a. General Utility Vehicles
	    b. Tanked Vehicles
	    c. Earth Moving Vehicles
	    d. Ancillary Vehicles
	    e. Accessory Equipments

1-3-2.	Describe the functions of each control, indicator, and display of the Mobile Construction Battalion Vehicles - Deployed system. Include, when applicable, electrical signal flow, fluid flow, steam flow, mechanical transfer, pneumatic control, position, color, or indication of each.
	
	    a. General Utility Vehicles
	    b. Tanked Vehicles
	    c. Earth Moving Vehicles
	    d. Ancillary Vehicles
	    e. Accessory Equipments

1-4.	INTERFACE DESCRIPTION There are no interfaces between the Mobile Construction Battalion Vehicles - Deployed system and any other system.
1-5.	OPERATIONAL DESCRIPTION
1-5-1.	Describe the authority and regulations pertaining to the operation of the Mobile Construction Battalion Vehicles - Deployed system.

TABLE S1037. Mobile Construction Battalion Vehicles - Deployed (System).	
ITEM No.	KNOWLEDGE/SKILL

1-5-2.	Describe operational tasks for Mobile Construction Battalion Vehicles - Deployed system.
	
	    a. Pre-operational procedures
	    b. Operational procedures
	    c. Post-operational procedures

1-5-3.	Describe indications which should or may occur during operation of the Mobile Construction Battalion Vehicles - Deployed system. Include alarms, indicators, displays, and readouts.
1-5-4.	Describe casualty/degraded/abnormal/not full mission capable mode(s) of operation for the Mobile Construction Battalion Vehicles - Deployed system.
1-5-5.	Describe data logging requirements for the Mobile Construction Battalion Vehicles - Deployed system. Include logging method, types of data logged, and disposition.
1-5-6.	Describe the personnel and equipment safety precautions which are to be observed during operation of the Mobile Construction Battalion Vehicles - Deployed system.
1-6.	MAINTENANCE DESCRIPTION

1-6-1.	Define the maintenance policy for the Mobile Construction Battalion Vehicles - Deployed system.
	
	   a. Preventive maintenance - the requirement for periodic performance of tasks to minimize malfunctions by doing the following:
	
	      (1) cleaning
	      (2) inspection
	      (3) lubrication
	      (4) painting
	      (5) degradation/deterioration checks
	      (6) performance checks
	      (7) pre-maintenance procedures

TABLE 4: EXAMPLE SYSTEM PPP TABLE (CONT'D)

TABLE S1037. Mobile Construction Battalion Vehicles - Deployed (System).	
ITEM No.	KNOWLEDGE/SKILL

1-6-1.
(Cont.)
	b. Corrective Maintenance - checks and procedures used to locate and correct malfunctions as determined by the following guides:
	
	    (1) Authorized repair responsibility to correct malfunctions to the authorized maintenance level.
	
	    (2) Fault Isolation - location of faults to the level of available spares, and to the authorized repair level including system operational checks and tests, as well as fault isolation tests and procedures.
	
	    (3) Analytical procedures - isolation of faults using authorized techniques not contained in prescribed maintenance documentation.
	
	    (4) Post-maintenance procedures - procedures performed after repair.

1-6-2.	Describe the use of special tools and test equipment required for maintenance of the Mobile Construction Battalion Vehicles - Deployed system as prescribed in applicable documentation.
1-6-3.	Describe preventive maintenance procedures for the Mobile Construction Battalion Vehicles Battalion Vehicles - Deployed system. Include recognition and interpretation of indications, records, and reports.
1-6-4.	Describe alignment, adjustment, and calibration procedures for the Mobile Construction Deployed system.
1-6-5.	Describe the operational tests used for maintenance of the Mobile Construction Battalion Vehicles - Deployed system. Include test name, use, and the procedures.
1-6-6.	Describe the recognition and interpretation of all malfunction indications for the Mobile Construction Battalion Vehicles - Deployed system.
1-6-7.	Describe the systematic fault isolation procedures contained in the prescribed maintenance documentation for the Mobile Construction Battalion Vehicles - Deployed system.

TABLE 4: EXAMPLE SYSTEM PPP TABLE (CONT'D)

TABLE S1037. Mobile Construction Battalion Vehicles - Deployed (System).

ITEM No.	KNOWLEDGE/SKILL
1-6-8.	Describe authorized techniques to isolate faults on the Mobile Construction Battalion Vehicles - Deployed system, which cannot be located using procedures contained in the prescribed documentation.
1-6-9.	Describe the post-repair procedures for the Mobile Construction Battalion Vehicles - Deployed system.
1-6-10.	Describe personnel and equipment safety precautions which are to be observed while performing maintenance on the Mobile Construction Battalion Vehicles - Deployed system.
1-7.	DOCUMENTATION
1-7-1.	Describe the organization, content, and use of all technical documentation provided for use with the Mobile Construction Battalion Vehicles - Deployed system.
2.	SYSTEM SKILLS
2-1.	OPERATION
2-1-1.	Perform tasks for operation of the Mobile Construction Battalion Vehicles - Deployed system. a. Pre-operational procedures b. Operational procedures c. Post-operational procedures
2-1-2.	Recognize and interpret all indications occurring during performance of operating procedures and perform appropriate operator actions in proper sequences for the Mobile Construction Battalion Vehicles - Deployed system.
2-1-3.	Perform tasks for casualty/degraded/abnormal/not full mission capable mode(s) of operation of the Mobile Construction Battalion Vehicles - Deployed system.
2-1-4.	Perform data logging requirements for the Mobile Construction Battalion Vehicles - Deployed system.
2-1-5.	Adhere to personnel and equipment safety precautions during operation of the Mobile Construction Battalion Vehicles - Deployed system.

TABLE 4: EXAMPLE SYSTEM PPP TABLE (CONT'D)

TABLE S1037. Mobile Construction Battalion Vehicles – Deployed (System).	
ITEM No.	KNOWLEDGE/SKILL
2-2.	MAINTENANCE
2-2-1.	Use special tools and test equipment required for maintenance of the Mobile Construction Battalion Vehicles – Deployed system.
2-2-2.	Perform preventive maintenance procedures, including quality assurance procedures for the Mobile Construction Battalion Vehicles – Deployed system, as scheduled by the Planned Maintenance System (PMS).
2-2-3.	Perform alignment, adjustment, and calibration procedures on the Mobile Construction Battalion Vehicles – Deployed system.
2-2-4.	Perform operational tests used for maintenance of the Mobile Construction Battalion Vehicles – Deployed system.
2-2-5.	Recognize and interpret all malfunction indications for the Mobile Construction Battalion Vehicles – Deployed system.
2-2-6.	Perform systematic fault isolation on the Mobile Construction Battalion Vehicles – Deployed system, using procedures contained in prescribed maintenance documentation.
2-2-7.	Use authorized methods to isolate faults on the Mobile Construction Battalion Vehicles Deployed system, which cannot be located using the procedures contained in the prescribed maintenance documentation.
2-2-8.	Perform post-repair procedures, including quality assurance procedures, on the Mobile Construction Battalion Vehicles – Deployed system.
2-2-9.	Adhere to personnel and equipment safety precautions when performing maintenance on the Mobile Construction Battalion Vehicles – Deployed system.

PPP TABLE CHECKLISTS

INTRODUCTION

The following tables provide a means of performing a content check on new or updated PPP Tables. E/SS/S and Non-Hardware PPP Table Checklists are included.

Read each category provided in the checklist and compare the new or updated PPP Table that you are working on against the same.

TABLE 6: CHECKLIST FOR EQUIPMENT PPPS

Category/Topic	Category/Topic
1-1 GENERAL (Knowledge	1-2 PHYSICAL DESCRIPTION (Knowledge)
Purpose	Equipment identification/nomenclature
Functional loops of which the equipment is a part	Name
Model differences	Physical appearance
Terminology and abbreviations	Reference symbols/designator
Operational characteristics (including but not limited to)	Location
	Equipment construction
Capabilities (limitations)	Weight/size requirements
Temperature operating ranges	Space requirements
Tape storage	Major components
Logic levels	Associated components/module recognition and mounting
Coordinate systems	Maintenance provisions
Word length	Chassis slides
Timing scheme	Tilt mechanisms
Arithmetic considerations	Access panels
General/special purpose	Controls, displays, and indicators
Types of memory	
Types of recording	Name

Category/Topic	Category/Topic
Frequency ranges	Location
Formatting	Reference designator
Accuracies	Positions and/or colors
Power requirements	Connectors/connections
Security	Signal input/output
1-2 PHYSICAL DESCRIPTION (Knowledge) - Continued	Power
	Power supplies and distribution
Wire routing	Protective devices (fuses, interlocks, etc.)
Shock mounting	
Hydraulic and pneumatic	Modes of operation (all levels)
Ventilation and cooling	Purpose
1-3 FUNCTIONAL DESCRIPTION (Knowledge)	Conditions for use
	Programs
Logical functional breakdown (proceeding from the whole to the single functional stage; e.g., amplifier stage, digital logic block, synchros, motors etc.) Functional levels (functional subdivisions at all levels)	Function of each control and/or indicator in each position/condition/color Programming Types and uses
	Methods of solution
Functional control	General
Mechanization (all levels)	Glossary of terms and symbols
Functional loops (within the equipment)	Instruction complement (repertoire)
Time and phase relationships	Word structure
Significant incidents	Instruction format
Time and/or mechanical sequences	Coding
Signal flow	Memory maps
Mathematical analysis	Program flow diagrams
Functional/physical relationships	Program listings
	Special diagrams
Alarm circuits	
Test circuits	

TABLE 6: CHECKLIST FOR EQUIPMENT PPPS (CONT'D)

Category/Topic	Category/Topic
1-3 FUNCTION DESCRIPTION (Knowledge) - Continued	1-4 INTERFACE DESCRIPTION (Knowledge) - Continued
Program, subprogram, routine, subroutine, etc. requirements	Power requirements/sources
	Input/output signals
Analytical description	Types
Purpose	Interpretation
Capabilities/limitations	Format
Modes and sequences	Source/destination
Logic functional breakdown	1-5 OPERATIONAL DESCRIPTION (Knowledge)
Mathematical analysis	Procedures
Mechanization	Regulation and authority
1-4 INTERFACE DESCRIPTION (Knowledge)	Pre-operational (includes tape installation, etc.)
Identification	Typical
Name	Emergency/casualty
Physical appearance	Post-operational
Reference symbols/designator	Security requirements
Location	Data and records
Physical	Analysis of operation information (displays, readouts, etc.)
Electrical	
Mechanical	Use of data (by whom, where, when, why)
Hydraulic	
Pneumatic	Logs
Functional	

TABLE 6: CHECKLIST FOR EQUIPMENT PPPS (CONT'D)

Category/Topic	Category/Topic
1-5 OPERATIONAL DESCRIPTION (Knowledge) - Continued	**1-6 MAINTENANCE DESCRIPTION** (Knowledge) Continued
Conditions of external equipment	CM requirements
Signals	Symptom recognition
Power Modes	Diagnosing
	Procedures
Safety	Authorized techniques
If there are no operation tasks associated with the equipment, the statement "No operation involved" will follow the heading.	Signal tracing, electrical or mechanical measurements
	Alignment, adjustment, and calibration
1-6 MAINTENANCE DESCRIPTION (Knowledge)	Disassembly and reassembly procedures (repair and/or replacement)
Maintenance policy	Safety
Regulations and authority	Security
Levels of preventive and corrective maintenance	**1-7 DOCUMENTATION (Knowledge)**
Preventive (schedules and records)	Documentation (for each consider knowledge of organization, contents, use, classification, function, interpretation, and use of symbols and terminology presented, etc.)
Corrective replaceable/ repairable philosophy and techniques)	
Special tools and test equipment	Equipment level technical documentation
PM requirements	**2-1 OPERATION (Skills)**
Inspection	Pre-operational
Cleaning	Locate controls
Lubrication	Initial control settings
Alignment, adjustment, and calibration	
Performance checks	

TABLE 6: CHECKLIST FOR EQUIPMENT PPPS (CONT'D)

Category/Topic	Category/Topic
2-1 OPERATION (Skills) - Continued	2-1 OPERATION (Skills) - Continued
Condition of external equipment	Safety
Signals	Security
Power	If there are no operation tasks associated with the equipment, the statement "No operation involved" will follow the heading.
Loads	
Install tapes/ribbons/paper	
Turn-on	2-2 MAINTENANCE (Skill)
Warm-up	Special tools and test equipment
Initialize	Preventive
Program load	Inspection
Parameter insertion	Cleaning
Checkout procedures	Lubrication
Operational	Alignment, adjustment, and calibration
Modes	Performance checks
Procedures	Corrective
Emergency/casualty	Fault isolation
Modes	Symptom recognition
Procedures	Diagnosing
Post-operational	Procedures
Procedures	Authorized techniques
Shutdown	Signal tracking (electrical/mechanical measurements)
Typical	Alignment, adjustment, and calibration
Emergency/casualty	
Data reduction	Removal and replacement (repair)
Log entries	Disassembly

TABLE 6: CHECKLIST FOR EQUIPMENT PPPS (CONT'D)

Category/Topic	Category/Topic
2-2 MAINTENANCE (Skills) - Continued	Alignments/adjustments
Assembly	Safety
Post corrective	Security
Performance checks	

TABLE 7: CHECKLIST FOR SUBSYSTEM PPPS

Category/Topic	Category/Topic
1-1 GENERAL (Knowledge)	Connection or signal flow
Purpose	Time sequence
Major components	Physical/functional relationships
Operational capabilities	Controls and indicators
Operational characteristics	Mathematical analysis
Limitations	Functional loops
Outputs and displays	Function
Model differences	Blocks
Special terminology, symbols, and abbreviations	Signals
Subsystem components	Control
Subsystem functions	Mechanical or optical assemblies
Subsystem tie-in	Sequential modes of operation
System tie-in	Alternate mode description
Operational characteristics	Test modes
Power requirements	Emergency (bypass) capabilities
Signal requirements	Capabilities for operational change in environmental extremes
Security	Programming
1-2 PHYSICAL DESCRIPTION (Knowledge)	**1-4 INTERFACE DESCRIPTION (Knowledge)**
Arrangement/construction features	Physical interface
Recognition of major components (controls, displays, and indicators)	Hydraulic
	Pneumatic
1-3 FUNCTIONAL DESCRIPTION (Knowledge)	Functional interface
Major functional block level	Power sources/requirements Power characteristics
Block names	
Signal names	Input signal sources

TABLE 7: CHECKLIST FOR SUBSYSTEM PPPS (CONT'D)

Category/Topic	Category/Topic
1-4 INTERFACE DESCRIPTION (Knowledge) - Continued	Theory
Output signal destinations	Functions
Interface component locations	Interpretation
Interface component identification	Safety
Interface signals	Security
Format of data	If there are no operation tasks associated with the equipment, the statement "No operation involved" Interpretation of signals will follow the heading.
1-5 OPERATION DESCRIPTION (Knowledge)	**1-6 MAINTENANCE DESCRIPTION (Knowledge)**
Operational theory (relationships of subsystem to system purpose)	Maintenance policy
Operational controls (positions)	Special tools and test equipment
Operational modes	Preventive maintenance procedures
Purposes	Indications
Effects	Records
Sequence	Reports
Conditions for use	Instructions
Interpretation of operational information (displays, readouts, etc.)	Alignment, adjustment, and calibration
Operational procedures (include tape, paper installation)	Operational test
Emergency operation procedures	Corrective maintenance
Operational logs	Symptom recognition
Operating regulations and authority	Fault isolation
Operational programs	Alignment, adjustment, and calibration
	Repair/assembly procedures Safety
	Security

TABLE 7: CHECKLIST FOR SUBSYSTEM PPPS (CONT'D)

Category/Topic	Category/Topic
1-7 DOCUMENTATION (Knowledge) Documentation (for each consider knowledge of organization, contents, use, and classification) Subsystem level technical documentation **2-1 OPERATION (Skills)** Operational conditions of external power sources Operational conditions of external signal sources Operational condition of external loads (dummy or real) Pre-operational procedures Safety Security Turn-on procedures Warm-up/standby sequence Typical operation Normal procedures (various modes) Abnormal environment procedures Emergency operation Shutdown Normal Emergency	Operational communications Post-operational procedures Data reduction (consider interpretation and use) Operational log entry If there are no operation tasks associated with the equipment, the statement "No operation involved" will follow the heading. **2-2 MAINTENANCE (Skills)** Special tools and test equipment Preventive Alignment, adjustment, and calibration Operational test Corrective Fault isolation Symptom recognition Alignment, adjustment, and calibration Repair procedures Safety Security

TABLE 8: CHECKLIST FOR SYSTEM PPPS

Category/Topic	Category/Topic
1-1 GENERAL (Knowledge)	**1-3 FUNCTIONAL DESCRIPTION (Knowledge) -Continued**
Purpose	Function of each control and indicator
Major components and functions	**1-4 INTERFACE DESCRIPTION (Knowledge)**
Model/series variations	Interface with other systems
Special terminology, abbreviations, and symbols	Signal source
Operational characteristics and capabilities	Signal destination
Power requirements	Signal characteristics
Environmental conditions	Power requirements
Accuracies	Power characteristics
Operational flexibility	**1-5 OPERATIONAL DESCRIPTION (Knowledge)**
Security	Authority and regulations
Unique knowledge factors not related to categories 1-2 through 1-7	Operational tasks/conditions
1-2 PHYSICAL DESCRIPTION (Knowledge)	Readiness condition procedures
Identification of system and subsystem components	Modified procedures
Location and description of displays, controls, and indicators	Monitoring
1-3 FUNCTIONAL DESCRIPTION (Knowledge)	Operational sequence
Functional operation/simulation	Analysis of indications
Control	Alarms
Signal flow	Displays
Sequential modes of operation	Readouts
Indications Programming Functional loops	Printouts
Logical functional breakdown	Data logging requirements
	Data reduction Safety

TABLE 8 CHECKLIST FOR SYSTEM PPPS (CONT'D)

Category/Topic	Category/Topic
1-6 MAINTENANCE DESCRIPTION (Knowledge) Maintenance policy Maintenance procedures System test Malfunction indications Fault isolation Repair Assembly Safety Security **1-7 DOCUMENTATION (Knowledge)** Documentation (for each consider knowledge of organization, contents, use, classification, etc.) System manual One-function diagram Preventive maintenance management plan Standard maintenance procedures Standard operating procedures System level programs and procedures **2-1 OPERATION (Skills)** Operational condition of external power sources Operational condition of external signal sources Operational condition of external loads (dummy or real)	**2-1 OPERATION (Skills) - Continued** Pre-operational procedures Safety Security Turn-on procedures Warm-up/standby sequence Typical operation Normal procedures (various modes) Abnormal environment procedures Emergency operation Shutdown Normal Emergency Operational communications Post-operation procedures Data reduction Operational log entry If there are no operation tasks associated with the system, the statement "No operation involved" will follow the heading. **2-2 MAINTENANCE (Skills)** To be covered in the subsystem/equipment level tables.

TABLE 9: CHECKLIST FOR TASK/FUNCTION PPPS

Category/Topic	Category/Topic
1. KNOWLEDGE	Functional description
Task purpose	Safety
Function purpose	2. SKILLS
Abbreviations	Use of tools
Terms	Use of test equipment
Symbols	Procedure performance
Completed Task characteristics	Policy compliance
Completed Function characteristics	Security
Policies	Precaution compliance
Authorities	Safety
Data Usage	Use of documentation
Logs	Security
Records	Tools
Procedures	Test equipment
Physical description	Organization
	Content
	Regulations

TABLE 10 CHECKLIST FOR BACKGROUND PPPS

Category/Topic	Category/Topic
KNOWLEDGE	Symbology
Principles	Terminology
Rules	SKILLS
Concepts	Mental
Phenomena	Physical

ADDENDUM E

DEVELOPMENT USING

EXPANDED TRAINING OBJECTIVE STATEMENTS (TOS)

AND CREATING THE

TABLE ASSIGNMENT CHART

COORDINATE TASK SET T0/BACKGROUND (B/G) AND TASK/FUNCTION (T/F)

- SKILL/KNOWLEDGE TOS

  - *T0/TOS Category*: Includes the background skill and knowledge which is prerequisite to the understanding of the operation and maintenance of the system, subsystem, or equipment and the task/function skill and knowledge which is not unique to the operation or maintenance of a particular system/subsystem/ equipment.
  - *S – B/G Skill*: Completion of training provides the PREREQUISITE (Background), PHYSICAL, or MENTAL Skills necessary to support follow-on training in COORDINATING the operation or maintenance of a system/subsystem/or equipment, or further background training.
  - *B1 – B/G Knowledge*: Completion of training provides the level of knowledge necessary to recognize or recall ideas, phenomena, symbology, and terminology which are PREREQUISITE to comprehension of a task or function.
  - *B2 – B/G Comprehension*: Completion of training provides the comprehension of principles, rules, and concepts necessary to solve given problems and situations and performance.
  - *J – T/F SKILL*: Completion of training provides the PHYSICAL AND/OR MENTAL Skills required to COORDINATE the job or task/function.
  - *Q – T/F KNOWLEDGE*: Completion of training provides the knowledge required to COORDINATE the job or task/function.

COORDINATE TASK SET - E/SS/S FAMILIARIZATION TOS

- F1 – Knowledge: Completion of training provides FAMILIARITY with the:

  - Purpose, operational concepts, location, capabilities, and limitations of a system/subsystem/equipment.
  - Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment.

- F1 Knowledge Training will provide: The coordinator with introductory information required for a basic understanding of the system/subsystem/equipment. This knowledge may be applied to general shipboard coordination duties and preparation for further training. F1 Knowledge may include, but is not limited to, familiarization with the purpose, function, and location of system/subsystem/ equipment and familiarization with supporting documentation.

COORDINATE TASK SET – E/SS/S OPERATION/MAINTENANCE SKILL TOS

- O1 – Skill – Completion of training provides the ability to coordinate operation and maintenance. The skills related to the duties of the coordinator are identified within this TOS Set as O1. These skills are primarily cognitive exercises and are implemented through the coordination of unit exercises, operations, and system level team training. During these coordination efforts, the coordinator is required to determine the effects that related subsystem and equipment operation, maintenance, or casualties may have on system operation and to ensure adherence to applicable security requirements and safety precautions.

- O1 Skill Training may include, but is not limited to, the following:

  - All applicable security requirements
  - All applicable safety precautions
  - Familiarity with normal and casualty/degraded/abnormal/not full mission capable operation and maintenance procedures
  - Use of applicable publications, data sheets, and records
  - Recognition of the effect of subsystem malfunctions on system operation

COORDINATE TASK SET - E/SS/S OPERATION/MAINTENANCE KNOWLEDGE TOS

- T1 - Knowledge: Completion of training provides the knowledge to coordinate operation and maintenance:

  - Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment
  - T1 Training provides the knowledge required for the coordinator to understand overall system/subsystem/ equipment operation and maintenance. This knowledge will support the coordination responsibilities.

- T1 Theory may include, but is not limited to, the following:

  - Purpose, function, and location of system/subsystem/equipment/software package
  - All applicable security requirements
  - All applicable safety precautions
  - Capabilities and limitations of the system/subsystem/equipment
  - Reference data such as weights, dimensions, and nomenclature
  - Description of the manner in which the system/subsystem/equipment/software package performs to the functional level, including modes of operation, operational sequences and input and output requirements and interface without coverage of functional circuit details, or program flow diagrams
  - Normal and casualty/degraded/abnormal/not full mission capable operational procedures
  - Maintenance policy and procedures
  - Knowledge of documentation
  - System/subsystem/equipment interface definition
  - Description of the effect of subsystem malfunctions on system operation
  - Knowledge of procedural discipline

DIRECT TASK SET - T0/B/G AND T/F

- SKILL/KNOWLEDGE TOS

  - *T0/TOS Category:* Includes the background skill and knowledge which is prerequisite to the understanding of the operation and maintenance of the system, subsystem or equipment and the task/function skill and knowledge which is not unique to the operation or maintenance of a particular system/subsystem/ equipment.
  - *S – B/G Skill*: Completion of training provides the PREREQUISITE (Background), PHYSICAL, or MENTAL Skills necessary to support follow-on training in DIRECTING the operation or maintenance of a system/subsystem/or equipment, or further background training.
  - *B1 – B/G Knowledge*: Completion of training provides the level of knowledge necessary to recognize or recall ideas, phenomena, symbology, and terminology which are PREREQUISITE to comprehension of a task or function.
  - *B2 – B/G Comprehension*: Completion of training provides the comprehension of principles, rules, and concepts necessary to solve given problems and situations and performance.
  - *J – T/F SKILL*: Completion of training provides the PHYSICAL AND/OR MENTAL Skills required DIRECTING the job or task/function.
  - *Q – T/F KNOWLEDGE*: Completion of training provides the knowledge required to DIRECT the job or task/function.

DIRECT TASK SET - E/SS/S FAMILIARIZATION TOS

- F1 – Knowledge: Completion of training provides FAMILIARITY with the:

  - Purpose, operational concepts, location, capabilities, and limitations of a system/subsystem/equipment.
  - Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment.

- F1 Knowledge Training will provide: The supervisor with introductory information required for a basic understanding of the system/ subsystem/equipment. This knowledge may be applied to general shipboard responsibilities and preparation for further training. F1 theory will include familiarization with the purpose, function, and location of system/subsystem/equipment and supporting documentation.

DIRECT TASK SET - E/SS/S OPERATION/MAINTENANCE SKILL TOS

- O1-Skill: Completion of training provides the ability to direct normal operations.
- O1 Skill Training will provide the supervisor with the basic skills required to direct normal operation of the system/subsystem/equipment.
- O1 Skill Training may include, but is not limited to, the following:

  - Location and function of system/subsystem/equipment controls and indicators related to directing normal operation
  - All applicable security requirements
  - All applicable safety precautions
  - Familiarity with normal operating procedures
  - Use of applicable publications, data sheets, and records

DIRECT TASK SET - E/SS/S OPERATION/MAINTENANCE SKILL TOS

- O2-Skill: Completion of training provides the ability to direct:

  - Normal operations requiring advanced analysis
  - Abnormal operations (defined as casualty/degraded/not full mission capable)

- O2 Skill Training provides the ability to direct casualty, degraded, abnormal, not full mission capable, and normal operational procedures requiring advanced analysis. O2 Skill Training is supported by T2 knowledge.
- O2 Skill Training may include, but is not limited to, the following:

- Location and function of all system/subsystem/equipment controls and indicators related to casualty/degraded/abnormal/not full mission capable operation and normal operational procedures requiring advanced analysis
- All applicable security requirements
- All applicable safety precautions
- Familiarity with all casualty/degraded/abnormal/not full mission capable operation procedures and all normal operating procedures requiring advanced analysis
- Use of applicable publications, data sheets, and records

DIRECT TASK SET - E/SS/S OPERATION/MAINTENANCE SKILL TOS

- M1-Skill: Completion of training provides the ability to direct maintenance.
- M1 Skill Training provides the ability to direct all system, subsystem, and equipment maintenance tasks. M1 Skill Training is supported by T2 Knowledge Training.
- M1 Skill Training may include, but is not limited to, the following:

  - All applicable security requirements
  - All applicable safety precautions
  - Special tools, test equipment, and accessory equipment
  - Familiarity with preventive and corrective maintenance procedures
  - Applicable publications, data sheets, and records

DIRECT TASK SET - E/SS/S OPERATION/MAINTENANCE KNOWLEDGE TOS

- T1-Knowledge: Completion of training provides the knowledge to direct normal operations:

  - Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment.

- T1 Training is defined by the requirements of O1 skill and T2 knowledge. In supporting O1, T1 will provide the knowledge to understand all normal operational tasks. In

supporting T2, T1 will provide the basic knowledge required to understand the theory of casualty operation and maintenance.

- T1 Training may include, but is not limited to, the following:

  - Purpose, function, and location of system/subsystem/equipment/ software package
  - All safety requirements applicable to normal operation
  - All applicable security requirement
  - Capabilities and limitations
  - Reference data such as weights, dimensions, and nomenclature
  - Description of the manner in which the system/subsystem/ equipment/software package performs to the functional level, including input and output requirements and interface without coverage of logic, circuits, or program flow diagrams
  - Modes of operation and operational sequences
  - Knowledge of documentation applicable to normal operation
  - System/subsystem/equipment interface definitions

DIRECT TASK SET - E/SS/S OPERATION/MAINTENANCE KNOWLEDGE TOS

- T2-Knowledge: Completion of training provides the knowledge to direct:

  - Normal operations requiring advanced analysis
  - Abnormal operations (defined as casualty/degraded/not full mission capable)
  - Maintenance

- T2 Training is defined by the requirements for O2 and M1 skills. In supporting O2, T2 shall provide the knowledge required to understand casualty/degraded/abnormal/not full mission capable operational tasks and normal operational tasks requiring advanced analysis. In supporting M1, T2 shall provide the knowledge required to understand all maintenance procedures.
- T2 Training may include, but is not limited to, the following:

  - Purpose, function, and location of system/subsystem/ equipment/software package
  - All applicable security requirements

- All applicable safety precautions
- Capabilities and limitations of the system/subsystem/ equipment software package
- Reference data unique to casualty operation
- Description of the manner in which the system/subsystem/equipment/software package performs to the functional level, including input and output requirements and interface without coverage of logic circuits, or individual program flow diagrams
- Casualty/degraded/abnormal/not full mission capable operation and operational sequences requiring advanced analysis
- Maintenance policy and procedures
- Detailed operational and functional sequences to the extent required to direct diagnosis of malfunctions
- Knowledge of documentation
- System/subsystem/equipment/software package interface definition
- Alignment, adjustment, and calibration procedures contained in publications, data sheets, and records

PERFORM TASK SET - T0/ B/G AND T/F

- SKILL/KNOWLEDGE TOS

  - *T0/ TOS Category:* Includes the background skill and knowledge which is prerequisite to the understanding of the operation and maintenance of the system, subsystem or equipment AND The task/function skill and knowledge which is not unique to the operation or maintenance of a particular system/subsystem /equipment.
  - *S – B/G Skill:* Completion of training provides the PREREQUISITE (Background), PHYSICAL, or MENTAL Skills necessary to support follow-on training in PERFORMING the operation or maintenance of a system/subsystem/or equipment, or further background training.
  - *B1 – B/G Knowledge:* Completion of training provides the level of knowledge necessary to recognize or recall ideas, phenomena, symbology, and terminology which are PREREQUISITE to comprehension of a task or function.
  - *B2 – B/G Comprehension:* Completion of training provides the comprehension of principles, rules, and concepts necessary to solve given problems and situations and performance.

- *J – T/F SKILL:* Completion of training provides the PHYSICAL AND/OR MENTAL Skills required PERFORMING the job or task/function.
- *Q – T/F KNOWLEDGE:* Completion of training provides the knowledge required to PERFORM the job or task/function.

PERFORM TASK SET - E/SS/S FAMILIARIZATION TOS

- F1 – Knowledge: Completion of training provides FAMILIARITY with the:

  - Purpose, operational concepts, location, capabilities and limitations of a system/subsystem/equipment.
  - Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment."

- Completion of F1 Knowledge Training provides: Introductory information required for a basic understanding of the system/subsystem/equipment. This knowledge may be applied to general shipboard responsibilities and preparation for further training. F1 theory will include familiarization with the purpose, function, and location of system/ subsystem/equipment and supporting documentation.

PERFORM TASK SET - E/SS/S OPERATION/MAINTENANCE SKILL TOS

- O1–Skill: "Completion of training provides the skill to perform normal operations."
- Completion of O1 Skill Training provides: The ability to perform, with supervision, normal operational procedures. O1 skills are performed using step by step procedures during the normal operational modes. These skills do not require advanced analysis. O1 Training is supported by T1 Knowledge and is normally taught in the replacement training environment. O1 Training may include, but is not limited to, the following:

  - Location and function of all system/subsystem/ equipment controls and indicators; including names and reference designators, control positions and indicator colors
  - Applicable security requirements
  - Applicable safety precautions
  - Power-on and shutdown procedures

- Preparation, pre-operation, operation, and post-operation
- Use of applicable publications, data sheets, and records

PERFORM TASK SET - E/SS/S OPERATION/MAINTENANCE SKILL TOS

- O2-Skill: Completion of training provides the skill to perform:

  - "Normal operations requiring advanced analysis"
  - "Abnormal operations (defined as casualty/degraded/not full mission capable)"

- Completion of O2 Skill Training provides: The ability to perform, with supervision, casualty/degraded/abnormal/not full mission capable operational procedures, and normal operating procedures requiring advanced analysis. Advanced analysis related to operational tasks may require the operator to use related skills and knowledge to analyze data and anticipate the subsystem and equipment reactions in different operational modes. For example, certain operational conditions not supported by documented procedures will require advanced analysis. O2 advanced analysis, in general, applies to those complex operational procedures which require additional training. O2 Training may include, but is not limited to, the following:

  - Location and function of all system/subsystem/equipment controls and indicators, including names and reference designators, control positions, and indicator colors
  - Applicable security requirements
  - Applicable safety precautions
  - Power-on and shutdown procedures
  - Preparation, pre-operation, operation, and post-operation
  - Casualty/degraded/abnormal/not full mission capable operational procedures
  - Use of applicable publications, data sheets, and records
  - Normal operational procedures requiring advanced analysis

PERFORM TASK SET - E/SS/S OPERATION/MAINTENANCE SKILL TOS

- P1-Skill: "Completion of training provides the skill to perform preventive maintenance"
- Completion of P1 Skill Training provides the ability to perform, with supervision, preventive maintenance procedures. P1 Training is supported by T2 knowledge. P1 Training is normally taught in the replacement training environment. P1 Training may include, but is not limited to, the following:

  - All applicable security requirements
  - All applicable safety precautions
  - Special tools, test equipment, and accessory equipment
  - Preventive maintenance procedures contained in publications, data sheets, and records
  - Pre-maintenance and post-maintenance procedures
  - Alignment, adjustment, and calibration procedures contained in publications, data sheets, and records
  - Those operational tests and procedures required to support preventive maintenance

PERFORM TASK SET - E/SS/S OPERATION/MAINTENANCE SKILL TOS

- C1-Skill: "Completion of training provides the skill to perform to the authorized maintenance level, systematic fault isolation procedures."
- Completion of C1 Skill Training provides the ability to perform, with supervision, basic fault isolation and repairs. Documented procedures associated with the C1 skill provide step by step procedures that do not require advanced analysis. This may include the use of functional block diagrams, built-in test equipment or test program, and automated test programs such as PM/FL, or other maintenance aids not requiring the application of knowledge of detailed logic, circuit analysis, or detailed mechanical breakdown. C1 Training is supported by T2 knowledge. C1 Training is normally taught in the replacement training environment. C1 Training may include, but is not limited to, the following:

  - Recognizing and isolating malfunctions of the system/subsystem/equipment
  - All applicable security requirements
  - All applicable safety precautions
  - Locating and replacing faulty components

- Alignment, adjustment, and calibration procedures
- Special tools, test equipment, and accessory equipment
- Use of procedures contained in applicable publications, such as data sheets, and records, such as diagnostics, fault isolation trees
- Applicable operational tests and procedures required to support documented fault isolation and repair

PERFORM TASK SET - E/SS/S OPERATION/MAINTENANCE SKILL TOS

- C2-Skill: "Completion of training provides the skill to perform to the authorized maintenance level:

  - "Systematic fault isolation procedures that require advanced analysis."
  - "Authorized techniques to isolate faults that cannot be isolated using procedures contained in prescribed documentation."

- Completion of C2 Skill Training provides the technician with the ability to perform, with supervision, corrective maintenance procedures that are not contained in prescribed documentation or documented procedures requiring advanced analysis. C2 advanced analysis may include documented maintenance procedures in which additional maintenance steps or diagnoses are required. C2 Training is supported by T3 knowledge. C2 Training is normally taught in the advanced training environment. This may include, but is not limited to, the following:

  - Recognizing, diagnosing, and isolating malfunctions
  - All applicable security requirements
  - All applicable safety precautions
  - Locating and replacing faulty components
  - Alignment, adjustment, and calibration procedures
  - Special tools, test equipment, and accessory equipment
  - Use of procedures contained in applicable publications, data sheets, and records
  - Replacement of piece-part components to the level of on board spares in systems/equipments whose primary maintenance policy is module or card replacement
  - Operational tests and procedures required to support un-documented faults isolation and repair and documented faults and isolation and repair requiring advanced analysis

PERFORM TASK SET - E/SS/S OPERATION/MAINTENANCE SKILL TOS

- C3-Skill: Completion of training provides the skill and knowledge to perform, without supervision:

  - "Diagnosis of equipment malfunctions, fault isolation, and all repairs"
  - "This skill is acquired through on-the-job experience, and reflects a continuous learning process that is supported by the skills and knowledge taught in the formal school environment"
  - "The Training Locator Indicator Code "1" will always be used to show this skill is acquired via "operational experience," i.e., shipboard performance"

PERFORM TASK SET - E/SS/S OPERATION/MAINTENANCE KNOWLEDGE TOS

- T1-Knowledge: Completion of training provides the knowledge to perform normal operations: "Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment."
- T1 Knowledge Training provides the depth of knowledge required to support performance of normal operational tasks, including only that functional operation necessary to understand normal operation. T1 Knowledge Training is defined by the requirements for O1 Skill Training. In supporting T2, T1 shall provide the basic knowledge required to understand the theory of casualty operation and all maintenance. T1 knowledge is normally taught in the replacement training environment. When applied to documentation, completion of training provides the level of knowledge required to use supporting documentation. T1 Training may include, but is not limited to, the following:

  - Purpose, function, and location of system/subsystem/equipment/software package
  - All applicable security requirements
  - All applicable safety precautions
  - Capabilities and limitations
  - Reference data such as weights, dimensions, and nomenclature
  - Description of the manner in which the system/subsystem/equipment/software package performs to the functional level, including input and output requirements and interface without coverage of logic, circuits, or program flow diagrams

- Modes of operation and operational sequences
- Applicable terminology and symbology
- Normal operational tasks

PERFORM TASK SET - E/SS/S OPERATION/MAINTENANCE KNOWLEDGE TOS

- T2-Knowledge: Completion of training provides the knowledge to perform:

  - "Normal operations requiring advanced analysis"
  - "Abnormal operations (defined as casualty/degraded/not full mission capable)"
  - "Preventive maintenance"
  - "Basic corrective maintenance"

- Completion of T2 Knowledge Training provides the depth of knowledge required to support the performance of the O2 Skills of casualty/degraded/abnormal/not full mission capable operation tasks and normal operational tasks requiring advanced analysis. In supporting the P1 Preventive Maintenance Skills and the C1 Corrective Maintenance Skills, T2 shall provide the depth of knowledge required to support the performance of all routine preventive maintenance and documented fault isolation and repair. T2 Training is defined by the requirements for O2, P1, and C1 Skills and T3 knowledge. In supporting T3, T2 shall provide the basic knowledge required to understand the theory of that corrective maintenance which is undocumented or requires advanced analysis. T2 Knowledge is normally taught in the replacement training environment. T2 Training may include, but is not limited to, the following:

  - Purpose, function, and location of the major subdivisions of the system/subsystem/equipment/ software package
  - Applicable security requirements
  - Applicable safety precautions
  - Description of the manner in which the function of each major subdivision within the system/subsystem/equipment/software package is accomplished, including data flow and interfaces without coverage of detailed logic, circuit analysis, or individual program flow diagrams
  - Mechanical, electrical, and electronic characteristics of the major subdivision of the system/subsystem/ equipment or program concepts of the software concepts

- Modes of operation and operational sequences, including time or phase relationships
- Procedures for casualty/degraded/abnormal/not full mission capable operation and normal operation requiring advanced analysis
- System/subsystem/equipment interface definition.
- Preventive and corrective maintenance policy and procedures
- Procedures for the use of built-in test equipment
- Procedures for the use of automated test programs and Performance Monitoring/Fault Localization (PM/FL)
- Applicable terminology and symbology
- Alignment, adjustment, and calibration procedures contained in publications, data sheets, and records

PERFORM TASK SET - E/SS/S OPERATION/MAINTENANCE KNOWLEDGE TOS

- T3-Knowledge: "Completion of training provides the knowledge to perform advanced corrective maintenance"
- Completion of T3 Knowledge Training provides the knowledge to support performance of undocumented fault isolation and repair and that documented fault isolation and repair requiring advanced analysis. T3 Training is defined by the requirements for C2 Skill. To identify and determine required T3 Knowledge, the developer must always analyze the maintenance function. For example, adjustment of a power supply may be classified as C2 Corrective Maintenance due to a requirement for advanced analysis; therefore, the knowledge supporting that maintenance will be classified as T3 even though it may describe input/out signals and potentiometer adjustments. T3 Knowledge is normally taught in the advanced training environment. The T3 Training may include, but is not limited to, the following:

- Purpose, function, and identification of logic elements, circuits, or programs
- All applicable security requirements
- All applicable safety precautions
- Description of the manner in which the function of each block of logic, group of circuits, or program segment is accomplished, including individual logic elements, circuits of program steps, as applicable. T3 Theory shall not cover signal, electron flow, or computer instructions, except for those logic elements or circuits unique to the equipment or program whose understanding is essential to support of maintenance

beyond automated test programs such as PM/FL (that is, those circuits not covered at the background theory level)
- Mechanical, electrical, and electronic characteristics of the logic elements or circuits
- Detailed operational and functional sequences, utilizing applicable documentation to the extent that malfunctions can be diagnosed
- Maintenance policy and procedures, including emergency provisions
- All applicable terminology and symbology
- Authorized alignment, adjustment, and calibration procedures

HOW TO CREATE A TABLE ASSIGNMENT CHART

- The Optional Table Assignment Chart (TAC) results when related courses are displayed in graph form with:

  - their course titles
  - course identification numbers
  - the related PPP Table Titles/Numbers
  - the appropriate TOS Codes
  - sequenced in the order taken

- A TAC is a horizontally arranged block diagram:

  - A series of blocks, or vertical solid or dashed lines, (command/developer preference) divide the TAC into different training areas ("background," "replacement/conversion," "advanced," "onboard," etc.) from one another
  - Blocks, each representing a separate course, are placed within the appropriate training areas in the same sequence as the courses are taken
  - PPP tables covered by the course are listed within the blocks in alpha/numeric order, reading top-to-bottom, left-to-right
  - CIN and course title are written above the block
  - When several courses are interrelated and require a sequence of instruction, the blocks are arranged vertically to indicate sequence, reading top to bottom, and left-to-right
  - When more than one block/course is shown they are also connected by a single line

- When a training area requires more than a single, vertical column of blocks, a second vertical column is started to the right of the first column (a line connects the first column bottom box with the second column top box)
- A PPP Table Index lists the titles of those PPP numbers which have been placed within the blocks:

  - The PPP Table Index is placed on the TAC
  - When the list is extensive, the PPP Table Index may be placed on a separate page

- Conversion training implies training is available in another training path. To show this training, draw a line to enter the TPC at the appropriate block/course, and label the line with the number of that Training Path

APPENDIX F

TRAINING OBJECTIVE STATEMENT

QUICK REFERENCE GUIDE

TOS LEVEL

NON-HARDWARE

BACKGROUND

KNOWLEDGE

B-1: Completion of training provides the level of knowledge necessary to recognize or recall ideas, phenomena, symbology, and terminology which are PREREQUISITE to comprehension.

B-2: Completion of training provides the comprehension of principles, rules and concepts necessary to solve given problems and situations.

SKILL

S: Completion of training provides the PREREQUISITE PHYSICAL or MENTAL Skills necessary to support follow-on training in PERFORMING the operation or maintenance of a system, subsystem, equipment, or further background training.

TASK/FUNCTION

KNOWLEDGE

Q: Completion of training provides the knowledge required to PERFORM the job or task/function.

SKILL

J: Completion of training provides the PHYSICAL and/or MENTAL Skills required PERFORMING the job or function.

HARDWARE

BACKGROUND

KNOWLEDGE

F-1: Completion of training provides familiarity with:

- Purpose, operational concepts, location, capabilities, and limitations of a system, subsystem, equipment

- Organization, content, and use of the technical documentation provided for use with the system, subsystem, equipment.

T-1: Completion of training provides the knowledge to support the performance of normal operations.

T-2: Completion of training provides the knowledge to support the performance of:

- casualty, degraded, not full mission capable operations
- preventive maintenance
- basic corrective maintenance

T-3: Completion of training provides the knowledge to support the performance of undocumented corrective maintenance.

SKILL

O-1: Completion of training provides the skill to perform normal operations with supervision.

O-2: Completion of training provides the skill to perform casualty, de-graded and not full mission capable modes of operation with supervision.

P-1: Completion of training provides the skill to perform preventive maintenance with supervision.

C-1: Completion of training provides the skill to perform documented fault isolation and repair, to the authorized maintenance level, using systematic fault isolation procedures with supervision.

C-2: Completion of training provides the skill to perform undocumented fault isolation and repair, to the authorized maintenance level with supervision.

Background

B1---None

B2---S

Task/Function

Q ---J

Hardware

F1---None

T1---O1

T2---O2, P1, C1

T3---C2