Naval Education and Training Command

NAVEDTRA 131A
July 1997

Support Manual for
MIL-HDBK-1379-2

PERSONNEL PERFORMANCE PROFILE BASED CURRICULUM DEVELOPMENT MANUAL

VOLUME I DEVELOPERS GUIDE

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LETTER OF PROMULGATION FOR NAVEDTRA 131A

1. This guidance manual has been extensively revised, in response to Navy and industry users. All changes reflect a continuing effort to increase the manual's utility to the training field. NAVEDTRA 131A supersedes and replaces NAVEDTRA 131.

2. A paradigm shift is taking place in Navy training materials development as we move from products developed within a rigid framework, and move toward design and development of training materials using a process oriented Instructional Systems Design/Systems Approach to Training (ISD/SAT). The ISD/SAT process is described in MIL-HDBK 1379-2 (9 June 1997). NAVEDTRA 131A supports the ISD/SAT process and training materials designed and developed using NAVEDTRA 131A are fully compatible with the ISD/SAT concept.

3. 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.

4. Guidelines for planning a curriculum development project and for producing training materials through the five stages of the PPP based method are contained in this manual. Guidelines for the implementation and evaluation of curriculum materials are contained in NAVEDTRA 135A, Navy School Management Manual (October 1995).

5. Procedural guidance for development of training materials following a task based method is published in NAVEDTRA 130A.

6. Corrections and comments concerning this manual are invited and should be addressed to Chief of Naval Education and Training, Education Training Systems (ETS) division.

7. Reviewed and approved.

F. T. DRUEN, JR.

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Chief of Naval Education and Training Education and Training Systems Division (ETS)

NAVEDTRA 131A, Volume I

NAVEDTRA 131A

PERSONNEL PERFORMANCE PROFILE BASED CURRICULUM DEVELOPMENT MANUAL

Developer's Guide

PUBLISHED BY DIRECTION OF CHIEF OF NAVAL EDUCATION AND TRAINING

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CHANGE RECORD

Number and Description of Change	Entered by	Date

FOREWORD

THE NAVEDTRA 130 SERIES MANUALS

This series of manuals is scheduled for publication:

- NAVEDTRA 130A Task Based Curriculum Development Manual
- NAVEDTRA 131A Personnel Performance Profile Based Curriculum Development Manual
- NAVEDTRA 134 Navy Instructor Manual
- NAVEDTRA 135A Navy School Management Manual

The NAVEDTRA 130A series of manuals provides fundamental guidance, within the Naval Education and Training Command, 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 Chief of Naval Education and Training Instructions (CNETINSTs) in these subject areas. Rather, they supplement the CNETINSTs in two important ways. First, they reflect the philosophical principles underlying CNET policy for curriculum, instruction, and evaluation and second, they provide procedures for carrying out that policy.

NAVEDTRA 130A SERIES INTERRELATIONSHIPS

Each of the 130 series 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 appropriately cross referenced to one another.

SCOPE

NAVEDTRA 131A: PERSONNEL PERFORMANCE PROFILE BASED CURRICULUM DEVELOPMENT MANUAL provides guidance for developing curricula to teach operation and maintenance of Hardware and/or performance of tasks or functions (NOTE: Hardware is any System/Subsystem/Equipment). The processes and illustrations found in NAVEDTRA 131A reflect the experience of subject matter experts, curriculum developers, and decision makers who approve Navy training material developed by Navy curriculum developers and civilian contractors. NAVEDTRA 131A describes and illustrates all facets of planning, analysis, design, and development of curricula. NAVEDTRA 131A provides step-by-step guidance to curriculum developers for developing job-efficient and effective training material.

Volume I of this manual—*Developer's Guide*— contains procedural guidelines for the development of training programs. It is designed for use by the individual actually revising or developing training materials. Waivers from any of these procedural guidelines are the responsibility of the Curriculum Control Authority (CCA) for the individual course.

The Volume I support manual—*Supplement*—contains Curriculum Developer Aids (CDAs) that help the developer construct the curriculum and course documentation pages.

Volume II of this manual—Sample Products—provides samples of each of the management and curriculum documents in a format that is consistent with the format conventions discussed in Volume I.

Volume III of this manual—Managers Guide—is designed for the individual charged with the management of a course revision or development. It describes approval points, approval authorities, and responsibilities. The volume addresses the manager's responsibilities in each of the stages of PERSONNEL PERFORMANCE PROFILE BASED CURRICULUM DEVELOPMENT.

RELATIONSHIP TO AIM

AIM (Authoring Instructional Materials) 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 compatable with the concepts of this manual.

CONTRACTUAL USE OF MANUAL

NAVEDTRA 131A 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 130A SERIES NAME	OPTIONAL NAME
Lesson Plan	Instructor Guide
Written Test	Knowledge Test
Resource Requirements List	Master Materials List/ Equipment Requirements List
Trainee	Student
Training Facility	Training Activity

IN PROCESS REVIEWS

Whether developed inhouse 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

- Personnel Performance Profile (PPP) Table Listing
- Draft new and/or modified PPP Tables
- Preliminary TPS

STAGE TWO

- Preliminary TCCD

STAGE THREE

- Cross sections of LP, TG/Instruction Sheets, 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 131A, VOLUMES I, II, AND III

NAVEDTRA 131A provides guidance and illustrations for use in the planning, analysis, design, development, implementation, and evaluation of curricula. This manual has been designed so you may read the entire chapter or go to any subject area and perform the required task.

VOLUME I

Volume I contains the step-by-step guidance for developing effective training materials. Additionally, the Volume I Supplement contains Curriculum Development Aids that help the developer construct the curriculum and course documentation pages. All chapters in Volume I were written so you can follow along with the corresponding figures, diagrams, Curriculum Development Aids, or examples presented in either Volume II or the Volume I supplement. It is important to open Volume II and/or the Volume I supplement when referenced and study the appropriate illustrations.

VOLUME II

Volume II contains examples of all the curriculum materials that make up a Course of Instruction 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 Training Path System (TPS), turn to the TPS section of the sample course in Volume II .

Volume II contains this sample course:

- An electronics course, “TRIDENT EXTERIOR COMMUNICATIONS SYSTEM”

VOLUME III

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.

Take a few moments and turn to the different volumes and see how they relate.

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Stage Four

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LIST OF ACRONYMS

AIM	Authoring Instructional Materials
BG	Background
CANTRAC	Catalog of Navy Training Courses
CCA	Curriculum Control Authority
CCMM	Course Curriculum Model Manager
CDA	Curriculum Developer Aids
CDP	Course Data Processing Code
CIN	Course Identification Number
CISO	Curriculum and Instructional Standards Office
CLO	Course Learning Objective
CMS	Course Master Schedule
CNATRA	Chief of Naval Air Training
CNET	Chief of Naval Education and Training
COI	Curriculum Outline of Instruction
COMTRALANT	Commander Training Command Atlantic
COMTRAPAC	Commander Training Command Pacific
DAVIS	Defense Audio-Visual Information System
DDA	Discussion-Demonstration-Activity
DITIS	Defense Instructional Technology Information System

LIST OF ACRONYMS (Continued)

DOR	Drop on Request
DP	Discussion Point
ECG	Exercise Controller Guide
EFR	Equipment Facility Requirements
FAL	Fault Applicability List
ICW	Interactive Courseware
IMI	Interactive Multimedia Instruction
IMM	Instructional Media Materials
LOEP	List of Effective Pages
LP	Lesson Plan
MCRF	Master Course Reference File
NAVEDTRACOM	Naval Education and Training Command
NAVIMP	Naval Imaging Program
NAVOSH	Navy Occupational Safety & Health
NAVPERS (Manual)	Manual of Navy Enlisted Manpower and Personnel Classification and Occupational Standards
NEC	Navy Enlisted Code
NETPDTC	Navy Education and Training Professional Development and Technology Center
NITRAS	Navy Integrated Training Resources and Administration System

LIST OF ACRONYMS (Continued)

NMPC	Navy Military Personnel Command
NOTAP	Navy Occupational Task Analysis Program
NTFS	Navy Training Feedback System
NTP	Navy Training Plan
NTRR	Navy Training Requirements Review
OAC	Profile Item-to-Topic Object Assignment Chart
OBT	On Board Training
OCCSTD	Occupational Standards
OJT	On-the-Job-Training
OPNAV	Office of Chief of Naval Operations
OPNAVINST	Chief of Naval Operations Instruction
POA&M	Plan of Action and Milestones
PPP	Personnel Performance Profile
PQS	Personnel Qualification Standards
RIA	Related Instructor Activity
RRL	Resource Requirements List
SYSCOM	Systems Command
T/F	Task/Function
TA	Training Agency
TAM	Table Assignment Matrix
TCCD	Training Course Control Document

LIST OF ACRONYMS (Continued)

TF	Training Facility
TG	Trainee Guide
TLA	Training Level Assignment
TLO	Topic Learning Objective
TOS	Training Objective Statements
TPC	Training Path Chart
TPEB	Training Performance Evaluation Board
TPP	Training Project Plan
TPS	Training Path System
TRACOM	Training Command
TSA	Training Support Agency
TTAP	Technical Training Audit Program
TTE	Technical Training Equipment
TTO	Training Time Out
VI	Visual Information

INTRODUCTION

CHAPTER 1

TRAINING MATERIALS DEVELOPMENT

INTRODUCTION

- The core procedures for developing training materials following the Personnel Performance Profile 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 Curriculum Control Authority's 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 131A: Personnel Performance Profile 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

PLANNING → ***CCA/Functional Commander/CNET/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 1.0 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.

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:

- *Training Project Plan* **(TPP)** – Discussed in Chapter 2
- *Personnel Performance Profile* **(PPP)** *Tables* – Discussed in Chapter 3
- *Training Path System* **(TPS)** – Discussed in Chapter 4
- *Training Course Control Document* **(TCCD)** – Discussed in Chapter 5
- *Testing Plan* – Discussed in Chapter 8 and NAVEDTRA 135A
- *Pilot Course Monitoring Report* – Discussed in Chapter 10

- *Audit Trail Documentation* – Discussed in NAVEDTRA 135A

1.2 Curriculum Materials

Curriculum materials include 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:

- *Lesson Plan* **(LP)** – Discussed in Chapter 6
- *Trainee Guide* **(TG)** – Discussed in Chapter 7
- *Test Package* – Discussed in Chapter 8 and in NAVEDTRA 135A
- 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. The following are the most common support materials:

- *Visual Information* and *Instructional Media Materials* – Discussed in Chapter 9
- Textbooks
- Technical Manuals
- Training devices
- Other materials helpful in the preparation and presentation of Lesson Topics (e.g. Fault Insertion Guide, Instructor Utilization Handbook)

SECTION 2.0 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.

2.2 Training Materials Modifications

There are four types of Training Materials Modifications: Interim Change, Change, Technical Change, and Revision. The definition for each category is found in NAVEDTRA 135A. Definitions and procedures for incorporating Training Materials Modifications are described in Volume III, Chapter 7.

SECTION 3.0 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.

3.1 Training Agency (TA)

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 *Chief of Naval Education and Training* **(CNET)** is a TA.

3.2 Functional Commander

CNET has designated Functional Commanders to plan, manage, and budget for training courses across broad functional areas. CNET's Functional Commanders are: *Deputy For Shore/Technical Training* **(CNET T2),** *Commander Training Atlantic* **(COMTRALANT)**, *Commander Training Pacific* **(COMTRAPAC)**, and *Chief of Naval Air Training* **(CNATRA)**.

3.3 Curriculum Control Authority (CCA)

To support CNET's functions as a Training Agency, CNET designates a Functional Commander to have curriculum control of specific courses/ training programs. The CCA functions identified in this manual are CNET's training agency responsibilities which are delegated to the Functional Commander having *curriculum control authority*. Curriculum control is normally exercised by the Functional Commanders in approving instructional methods and materials and in conducting, programming resources for, and maintaining assigned courses. A single alphabetic character is used in the first position of the *Course Identification Number* **(CIN)** to identify the command which has curriculum control authority. Volume I of NAVEDTRA 10500 *Catalog of Navy Training Courses* **(CANTRAC)** identifies the command having curriculum control for existing courses. For courses under CNET's cognizance, CNET designates the Functional Commander who exercises curriculum control authority.

3.4 Training Support Agency (TSA)

An office, command, or headquarters responsible for providing material and other forms of support to the Training Agency (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.

3.5 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 inhouse-developed courses.

3.6 Training Facility (TF)

A Navy command which has a primary mission of conducting or supporting training. A school or institution at which courses are offered.

SECTION 4.0 APPLICABLE DOCUMENTS

The documents listed below are the primary resources to be used by developers in the design and development of training materials. Use of documents and manuals in effect when you start development of training materials 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. Many acronyms and abbreviations used in these chapters are common throughout the Navy. Other acronyms used are unique to training. A List of Acronyms is provided in the Front Matter of this manual.

4.1 RELATIONSHIP TO AIM

AIM (Authoring Instructional Materials) 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.

4.2 PUBLICATIONS

Chief of Naval Operations

OPNAVINST 1500.2 *Responsibilities and Procedures for Establishment and Coordination of Contractor Developed Training for Military and Civilian Personnel*

OPNAVINST 1500.8 *Navy Training Plan Process*

OPNAVINST 1500.19 *Authority and Responsibility of Fleet Commanders in Chief Atlantic and Pacific and the Chief for Naval Education and Training for Naval Education and Training Activities Ashore*

OPNAVINST 1500.27 *Interservice Training*

OPNAVINST 1500.44 *Responsibilities for Development of Personnel Training Requirements and Related Plans*

OPNAVINST 1500.52 *Surface Warfare Training System Policy, Organization, and Responsibilities*

OPNAVINST 1500.69 *Navy Training Requirement Review (**NTRR**)*

OPNAVINST 1500.71 *Navy Training Feedback System (**NTFS**)*

OPNAVINST 1550.6 *Review of Navy Formal School Curricula and Instructional Literature*

OPNAVINST 1550.8 *Development, Review, and Approval of New or Modified Training Course Curricula*

OPNAVINST 3500.34 *Personnel Qualification Standards (**PQS**) Program*

OPNAVINST 5100.8 *Navy Safety and Occupational Safety and Health Program*

OPNAVINST 5100.19 *Navy Occupational Safety and Health **(NAVOSH)** Program Manual for Forces Afloat*

OPNAVINST 5100.23 *Navy Occupational Safety and Health **(NAVOSH)** Program Manual*

OPNAVINST 5290.1 *Naval Imaging Program (**NAVIMP**) Policy and Responsibilities*

OPNAVINST 5510.1 *Department of the Navy Information and Personnel Security Program Regulation*

OPNAVINST 11102.1 *Policies and Procedures for Training Equipment Facility Requirements **(EFR)***

NAVPERS 18068 *Manual of Navy Enlisted Manpower and Personnel Classifications and Occupational Standards*

Chief of Naval Education and Training

NAVEDTRA 130A *Task Based Curriculum Development Manual*

NAVEDTRA 131A *Personnel Performance Profile Based Curriculum Development Manual*

NAVEDTRA 134 *Navy Instructor Manual*

NAVEDTRA 135A *Navy School Management Manual*

NAVEDTRA 10500 *Catalog of Navy Courses (**CANTRAC**)*

NAVTRASYSCEN P-530 *Naval Training Systems Center Guide*

CNETINST 1500.1 *Catalog of Navy Training Courses (**CANTRAC**) (NAVEDTRA 10500)*

CNETINST 1500.15 *Accreditation of Navy Schools*

CNETINST 1500.18 *Responsibilities and Procedures for NAVEDTRACOM Participation in Contractor Developed Training*

CNETINST 1500.20 *Safety Procedures for Conducting Training*

CNETINST 1500.21 *Development of Interactive Courseware (**ICW**) in Support of Instructional Systems*

CNETINST 1500.23 *Interservice Training Review Organization (ITRO)*

CNETINST 1500.25 *Surface Warfare Training Requirements Review (SWTRR)*

CNETINST 1500.28 *Total Quality Instruction*

CNETINST 1500.24 *Training Performance Evaluation Board **(TPEB)***

CNETINST 1510.1 *Navy Integrated Training Resources and Administration System (**NITRAS**)*

CNETINST 1540.7 *Responsibility for Revising Navy Occupational Task Analysis Program (**NOTAP**) Survey Booklets and Procedures for Requesting NOTAP and Occupational Standards (**OCCSTD**) Data and Services*

CNETINST 1540.13 *Preparation of Course Master Schedules and Master Schedule Summary Sheets*

CNETINST 1543.4 *Technical Training Equipment (**TTE**)*

CNETINST 1550.10 *Production, Approval, Implementation, and Cancellation of Training Programs and Materials*

CNETINST 1550.21 *Occupational Standards (OCCSTDS) Training Task Analysis (TTA) Procedures*

CNETINST 3500.3 *Personnel Qualification Standards (**PQS**) Program*

CNET 5100.2 *Safety and Occupational Health Program*

CNETINST 5290.3 *Chief Naval Education and Training (**CNET**) Visual Information Program Management*

CNETINST 5311.1 *Computation of Instructor Requirements*

CNETINST 7500.2 *Technical Training Audit Program (**TTAP**)*

CNETINST 11102.2 *Policies and Procedures for Training Equipment Facility Requirements (**EFR**)*

Training Requirements Data Base Annual Report - Naval Education and Training Program Management Support Activity (***NETPDTC***)

SECTION 5.0 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).

SECTION 6.0 SAFETY REQUIREMENTS

Safety, occupational health, and hazard awareness information must be incorporated into the curricula of all appropriate training courses, as prescribed by CNETINST 1500.20 and in NAVEDTRA 135A.

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. Planning consists of gathering information and building the plan for training material revision or development. The output product of this step is the *Training Project Plan* **(TPP)**. When approved, the TPP becomes the authorization to undertake a course revision or a new course development project and initiate resource requisitions.

The TPP is often developed by senior course managers in conjunction with the *Curriculum and Instructional Standards Office* **(CISO)**. As it describes the scope and intent of the curriculum revision or development and describes the fleet need which generated the training requirement, the curriculum developer should review the TPP before developing any other management or curriculum materials.

> The Foreword and How to Use NAVEDTRA 131A contain guidelines for reading this manual – you should read them now if you have not already done so.

CHAPTER'S SCOPE

- Describe the factors to be considered when developing a TPP for new course development or a course revision
- Describe the content requirements and format conventions of the TPP

> Volume III, Chapter 2, provides additional information on TPP development.

SECTION 1.0 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 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.

- Planning precedes the five stages of the training materials development process. The output, the TPP, provides the blueprint for the revision of existing courses or the development of a new course
- A TPP may also be used to document a *change* in course length
- Other applications for the TPP are discussed in CNETINST 1550.10

COURSE REVISION: Prior to starting the revision or development of new training materials for existing training courses a TPP will be developed and approved in accordance with CNETINST 1550.10.

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 the *Navy Integrated Training Resources and Administration System* **(NITRAS)**, identifying preliminary resource requirements, and possibly planning for facilities' requirements. This entails careful research and documentation. See NAVEDTRA 135A for a complete listing of steps required to implement a new course.

SECTION 2.0 JUSTIFICATION FOR COURSE REVISION OR DEVELOPMENT

There has to be a reason (or reasons) to undertake the development of a new course or the revision of an existing course. The justification for initiating the development of a new course or the revision of existing training materials may come from:

- *Navy Training Plans* **(NTPs)** (OPNAVINST 1500.8)
- Tasking by higher authority
- Internal course reviews and local command initiatives
- External feedback
- Surveillance
- Training Appraisal

SECTION 3.0 TRAINING PROJECT PLAN (TPP)

- The TPP presents a plan for curriculum development and training material modification which contains course data, justifications for the course revision or new course development, impact statements, milestones, and resource requirements

Each project plan will be as unique as the project it describes. The CCA, working with 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.

SECTION 4.0 PURPOSE AND USE OF A TPP

The TPP describes training and training support 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
- A TPP should meet, and not exceed, the training requirement

SECTION 5.0 CATEGORIES OF RESOURCES

Course development and, often, course revisions require 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.

SECTION 6.0 INITIATING A TPP

A TPP is a proposal to develop a new course or to revise an existing course. The decision to prepare a TPP can come from the commanding officer or officer in charge of the training activity or from higher authority.

- The *Course Curriculum Model Manager* **(CCMM**) will develop and submit the TPP for a course revision

- The CCA, via the Functional Commander, can designate an activity to be the CCMM for a new course and direct it to develop the TPP for a new course, or it may be developed by another agent for the CCA

SECTION 7.0 TPP OUTLINE

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

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.

- Specific elements of data and information shall include the following items where applicable
  - Cover Page
  - Table of Contents
  - Justification
  - Impact if the course development or revision is not undertaken
  - Course Data Page
  - Safety Risks and Hazardous Materials exposure
  - Curriculum development method recommended
  - Milestones
  - Resource requirements

STAGE ONE

CHAPTER 3

PERSONNEL PERFORMANCE PROFILES

INTRODUCTION

In the previous chapter a Training Project Plan **(TPP)** was created which outlined proposed new or revised training and identified resources. Building from available resources, job skills and knowledge are identified and listed.

> The Foreword and How to Use NAVEDTRA 131A contain guidelines for reading this manual – you should read them now if you have not already done so.

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 PPPs

- Course development is initiated by a training requirement, such as
  - 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—this means
  - Identifying, by analysis, all skills and knowledge associated with performance of the requirement

- Compiling these skills and knowledge into a list

> Skills and knowledge lists go by various names—dependent upon where the list is being described.
>
> PERSONNEL PERFORMANCE PROFILE (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

CHAPTER'S SCOPE

- To provide information vital to understanding PPPs
- To explain that terminology which acquires a unique meaning when applied to PPPs
- To explain the step-by-step process for developing PPP Tables as presented in Curriculum Developer Aids **(CDAs)** and the PPP Model Statements

> The CDAs for PPP Table Development and Model Statements lead you step-by-step through development of a PPP Table but do not explain the "how" of the process.
>
> The CDAs and Model Statements enable you to develop PPP Tables relatively quickly and easily.

- And, finally, to provide sufficient information for decisions to be made

SECTION 1.0 WHAT ARE PPPs?

1.1 PPPs are

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

PPP DEFINED

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

IMPORTANCE OF PPPs

PPPs are the single-most important element of curriculum development

- 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

Track of Selected "PPP Line Item/Table Number Reference" Through A Curriculum, is illustrated in the Volume I Supplement (See Table of Contents for specific page).

SECTION 2.0 PPP CATEGORIES/TYPES

2.1 PPP categories are

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

> 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
- Equipment

HARDWARE

- Task/Function
- Background

NON-HARDWARE

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

See Volume II for PPP Table examples

- TAB A-2. System PPP F0147
- TAB A-2. Subsystem PPP F0156
- TAB A-2. Equipment PPP F0194/F0202
- TAB A-2. Task/Function PPP B0076
- TAB A-2. Background PPP A0002

2.3 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

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

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*

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

2.4 Hardware PPP Table Relationships

- It is possible that the same Hardware may logically be designated as being either:
  - A System,
  - Or a Subsystem,
  - Or an Equipment
- What to call this Hardware depends upon:
  - Size and complexity,
  - Eventual usage and developer's intent

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; a 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

2.5 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 an "Equipment"—Thus, the Systems become Equipment PPPs
- Write the System PPP title and Subsystem PPP titles needed for your training program
- Write—in this order—the titles of the Equipment, Task/Function, and Background PPP Tables that are required

This somewhat involved process helps to ensure that only the PPPs that are necessary for the training program are developed

Refer to Figures 3-1 and 3-2 for an illustration of these concepts.

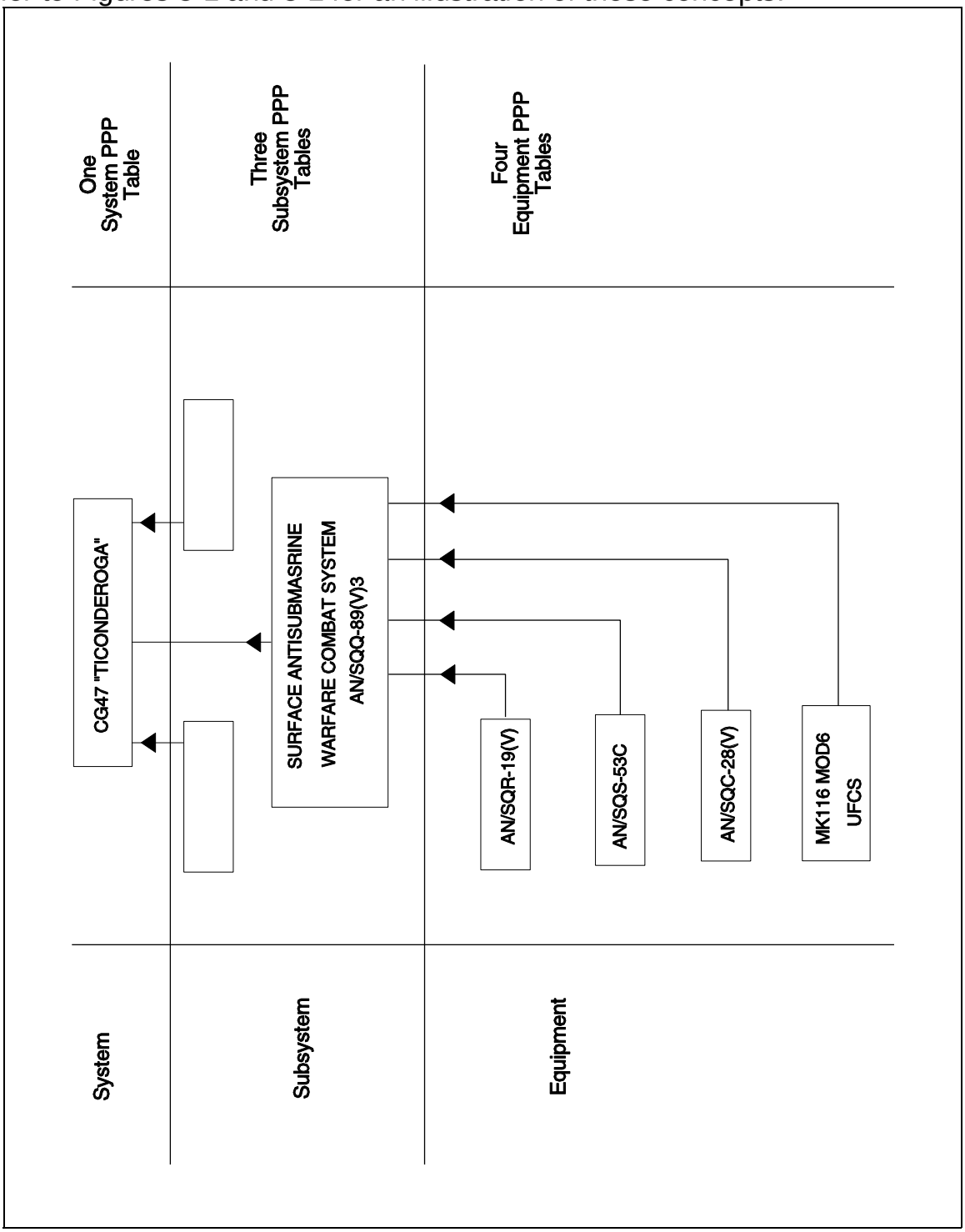


FIGURE 3-1: THE WEAPONS PLATFORM AS THE SYSTEM

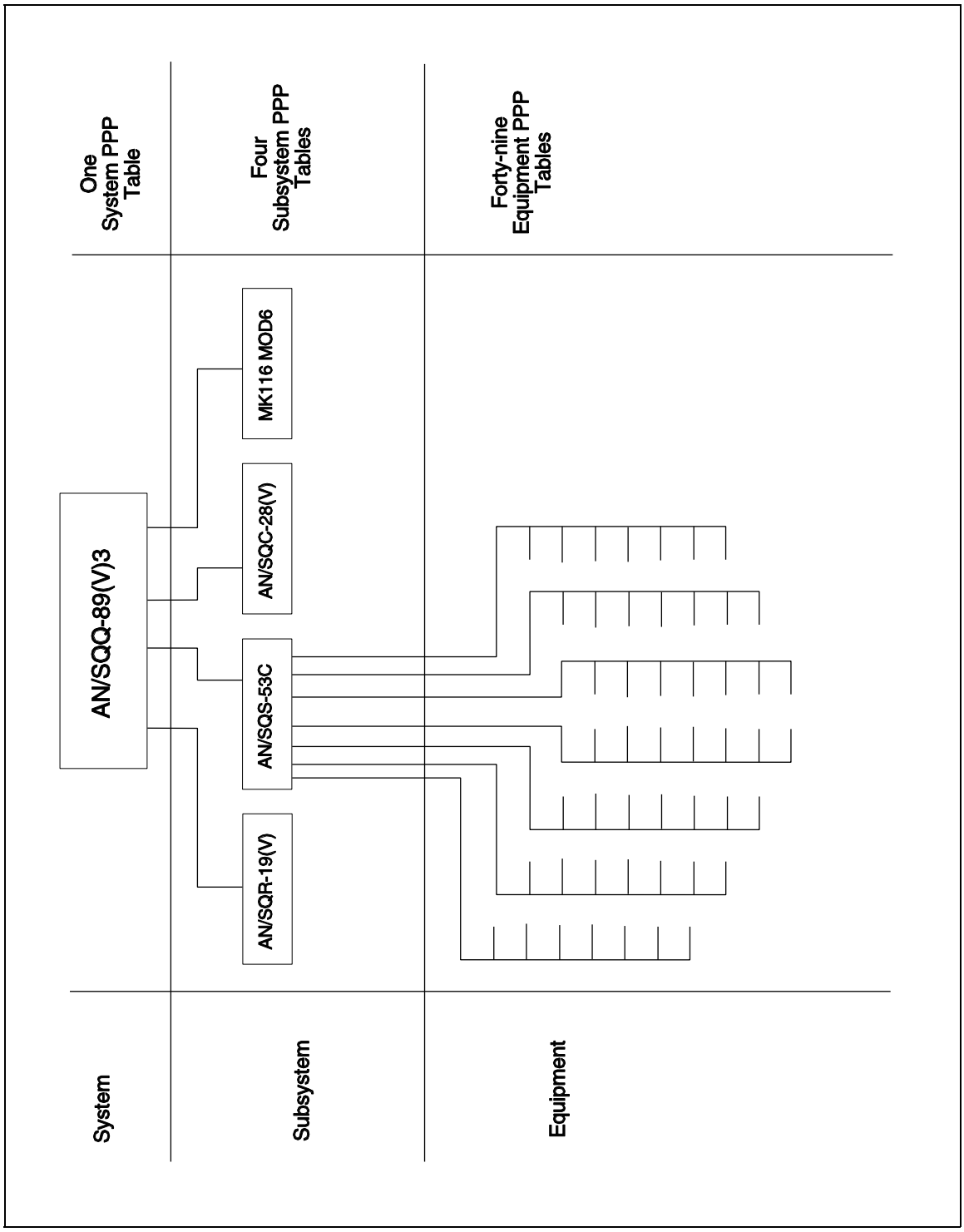


FIGURE 3-2: THE AN/SQQ-89(V)3 AS THE SYSTEM

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

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

> 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*.

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)

Both approaches can produce equally good curricula.

Generic PPP tables are preferred for use when:

- The specific equipment type 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

> 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.

2.6 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

> 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

> These PPPs list those things a person must **FIRST** know, and be 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

> These PPPs are often organized around subject matter areas, such as the following:
>
> *Mathematics - Basic Electricity - Basic Electronics*

2.7 Non-Hardware PPP Discussion—Task/Function (T/F)

- A T/F is not unique to the operation and maintenance of any one particular system, subsystem, or equipment
- To perform a given T/F, e.g., instructing, requires many different skills and knowledge—all leading to a single application
- A T/F usually has one of the following endings—ING, ION, MENT:
  - Cooking (NOT Cooker)
  - Navigation (NOT Navigator)

- Training Management (NOT Training Manager)

- See Figure 3-3 for an illustration

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

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

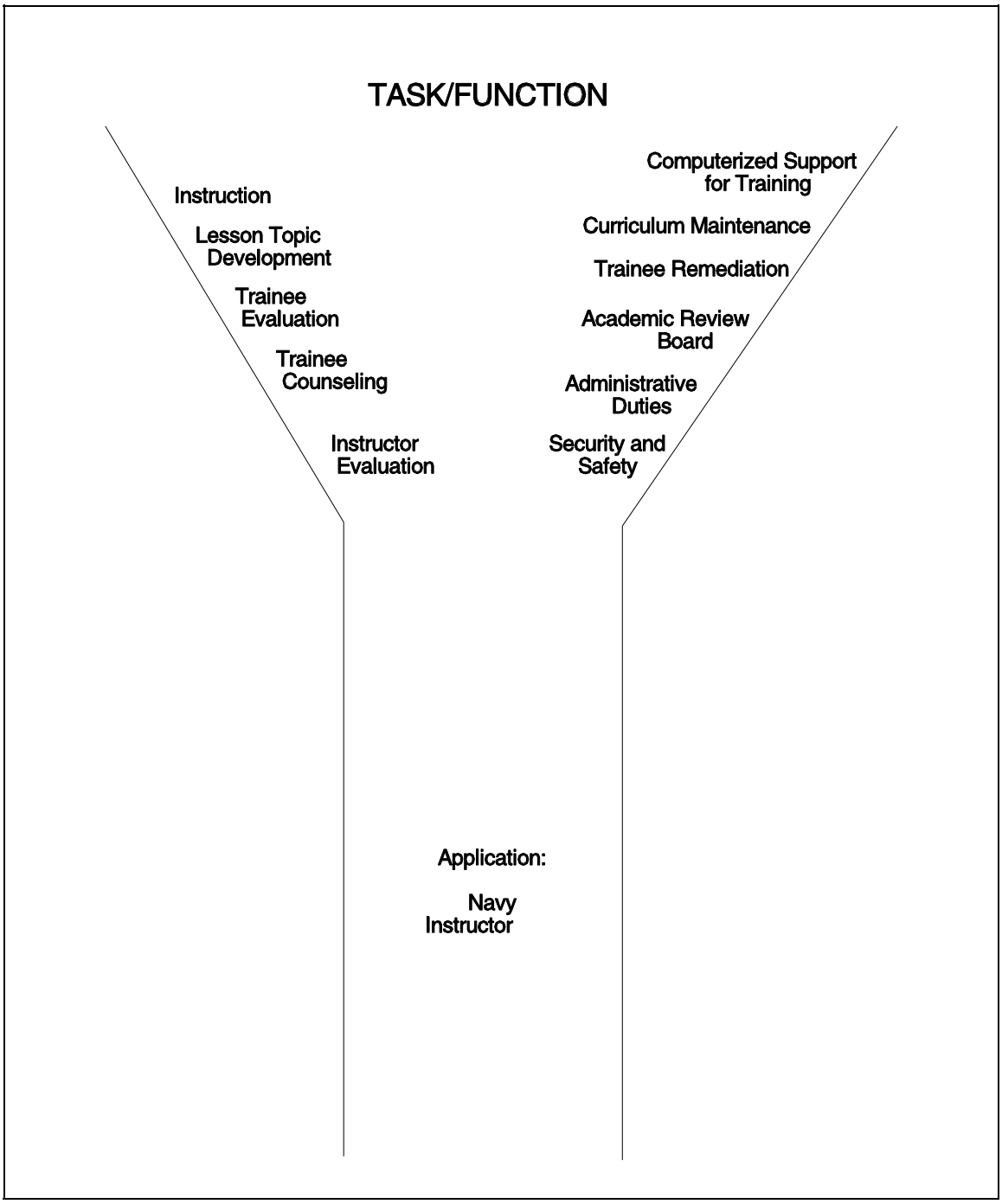


FIGURE 3-3: SKILLS AND KNOWLEDGE REQUIRED FOR THE TASK/FUNCTION "NAVY INSTRUCTOR"

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 B/G skills and knowledge, i.e., *mathematics*, have an almost unlimited range of application and usefulness, as illustrated by Figure 3-4

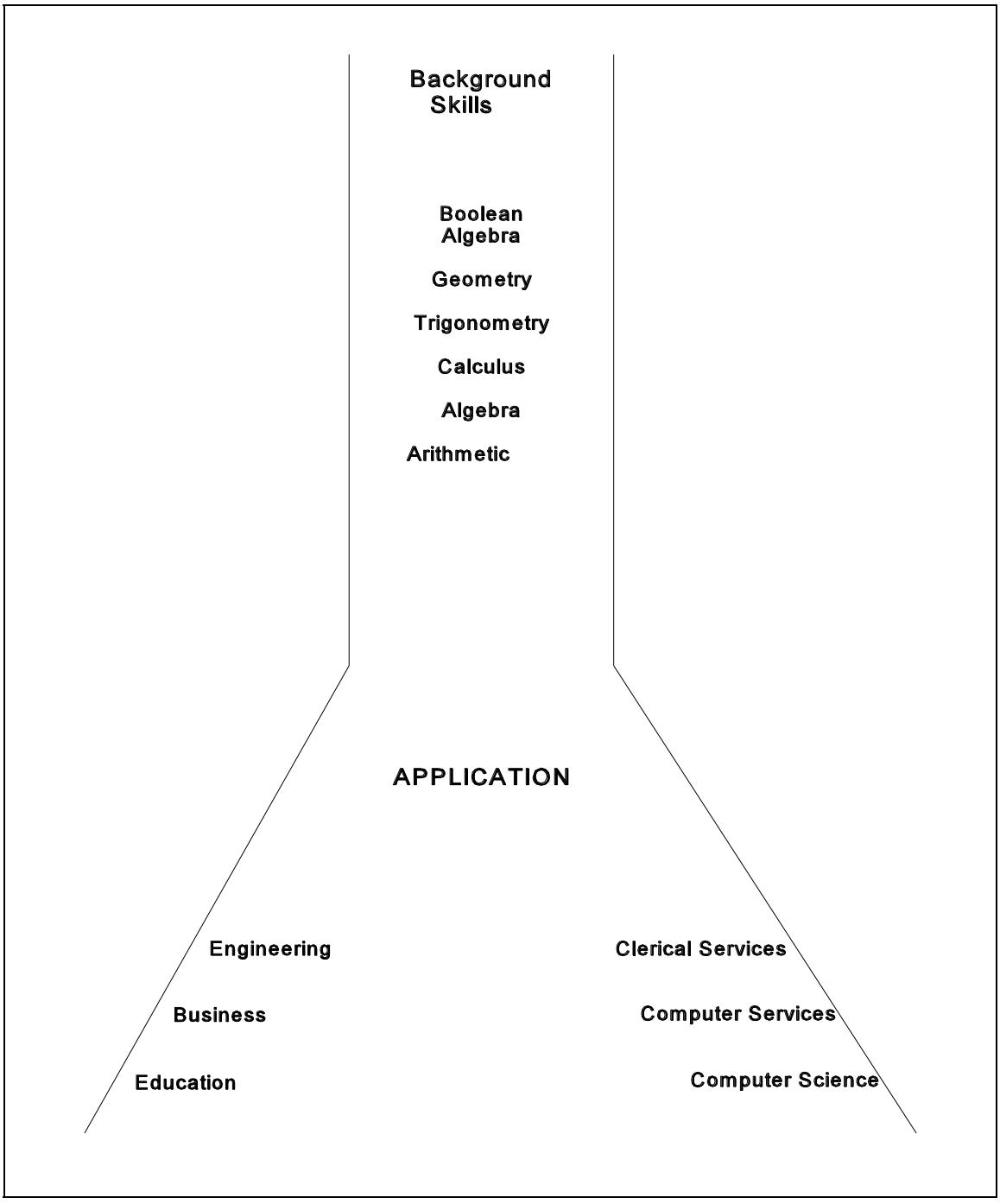


FIGURE 3-4: HOW BACKGROUND SKILLS APPLY TO A VARIETY OF APPLICATIONS

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.

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 (CCA) for review and approval.

The remainder of this chapter discusses both the compilation of PPPs when tables exist to meet your requirements, and development of PPPs when none exist at all.

SECTION 3.0 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

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 the:

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

- Please note that

  - 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 on the ____”

  IS “general” because it encompasses ALL PM tasks
  IS “specific” when the exact Hardware name is written in
  IS 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

> 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
- This Figure also shows how a PPP statement can be derived from a comprehensive task analysis

The following examples will be used to explain the rules for writing quality PPPs covered on the preceding pages. See the following page for this explanation.

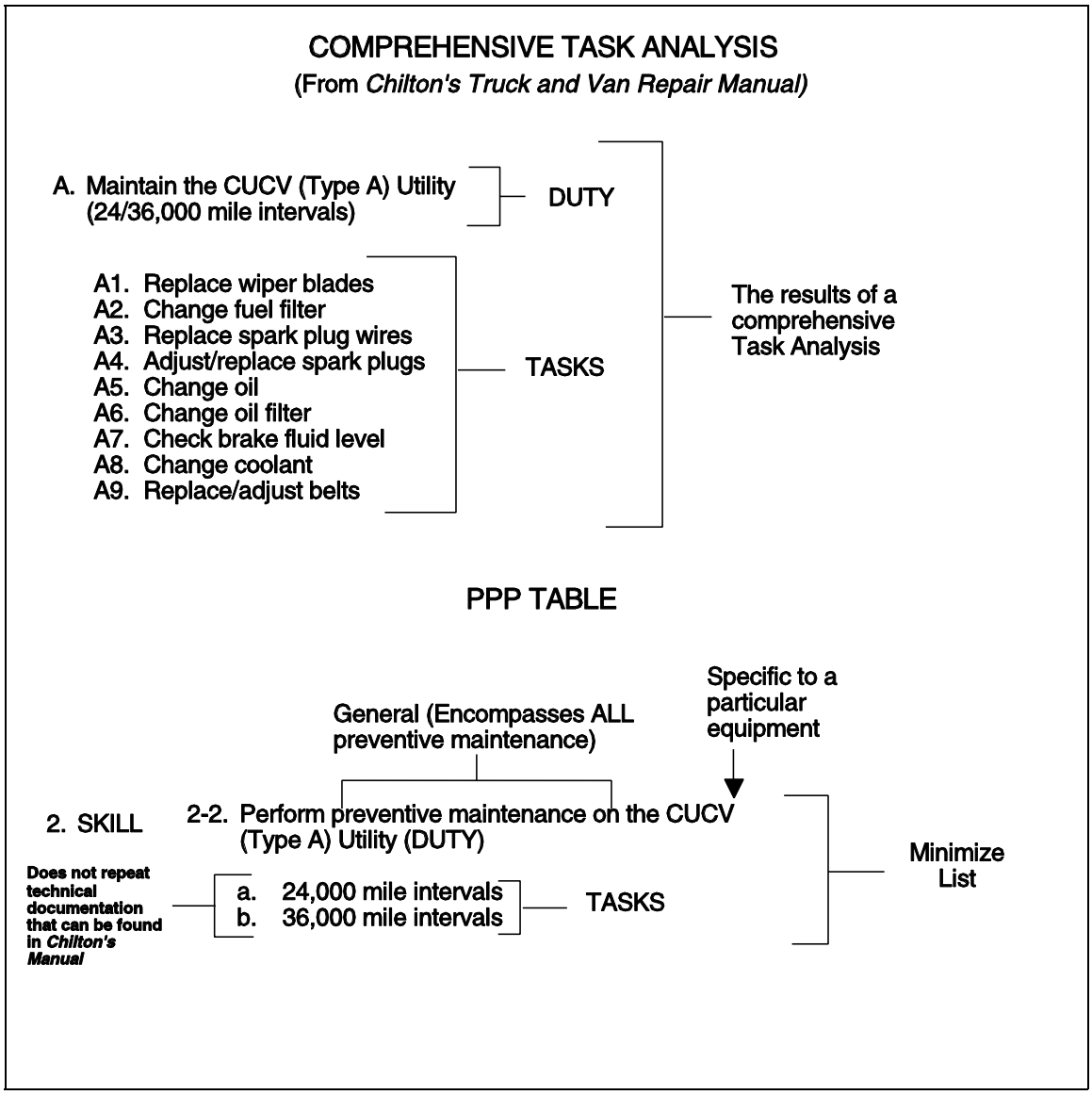


FIGURE 3-4: MINIMIZING COMPREHENSIVE DATA

PPPs are developed from a comprehensive task analysis

- Shown first is a list of tasks resulting from a comprehensive task analysis, extracted from Chilton's..., for performing 24/36,000- mile maintenance on the CUCV

- One duty (A) and nine tasks (A1—A9) are identified as required to perform maintenance on the CUCV at 24/36,000 miles

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

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

Each PPP skill statement selected for training is later subjected to a comprehensive task analysis

- 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 a minimum requirements listing, *as this information is now available where required*
- To protect integrity of already-developed courses:
  - PPPs are modified only in accordance with procedures contained in Volume III
  - The PPP goes away only when the hardware goes away

3.7 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

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.

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

- The developer thinks only of those skills and knowledge required for THEIR course

In making this mistake the developer:

- Shortens the list of PPP line items
- Narrows the scope of the PPP
- Reduces its usability—so that it applies only to a single course or skill category

3.8 Skills are always determined first

- Knowledge is always determined last
  - After ALL skills have been identified

> This rule applies everywhere in this system of curriculum development.

- ALL knowledge must support a skill(s)
  - Either “directly” or “indirectly”
- Nice-to-know information is not allowed

By determining skills first and knowledge last, you ensure that training emphasizes performance, such as

- Operating/maintaining hardware
- Performing a task or function

Your focus as a developer must always be

- PERFORMANCE of the skills

3.9 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

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

3.10 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

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

3.11 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 4.0 DEVELOP YOUR HARDWARE PPPs

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 7 categories of knowledge

  1-1. GENERAL DESCRIPTION
  1-2. PHYSICAL DESCRIPTION
  1-3. FUNCTIONAL DESCRIPTION
  1-4. INTERFACE DESCRIPTION
  1-5. OPERATIONAL DESCRIPTION
  1-6. MAINTENANCE DESCRIPTION
  1-7. DOCUMENTATION DESCRIPTION

  > See *Volume I Supplement* for a description of the contents of each of the 7 knowledge categories.

- Technical manuals are often organized this same way

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

- 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) subitem 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	Maintenance Description
1-6-1	Define the Maintenance policy for _____ — PPP line item
	a. Preventive Maintenance — Sublevel 1
	(1) Servicing (2) Operational Check — Sublevel 2
	(a) Premaintenance Procedure (b) Performance Checks — Sublevel 3

- Volume I supplement 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 5.0 DEVELOP YOUR TASK/FUNCTION PPPs

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 traffic signs	Sublevel 2
	(a) Stop upon recognition of octagon shape	Sublevel 3

- 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 subitems of a line item
- Three subitem levels are allowed

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 130A: *Task Based Curriculum Development Manual*.

It may not be necessary for you to go the 3rd (or even 2nd) level of subitems 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”

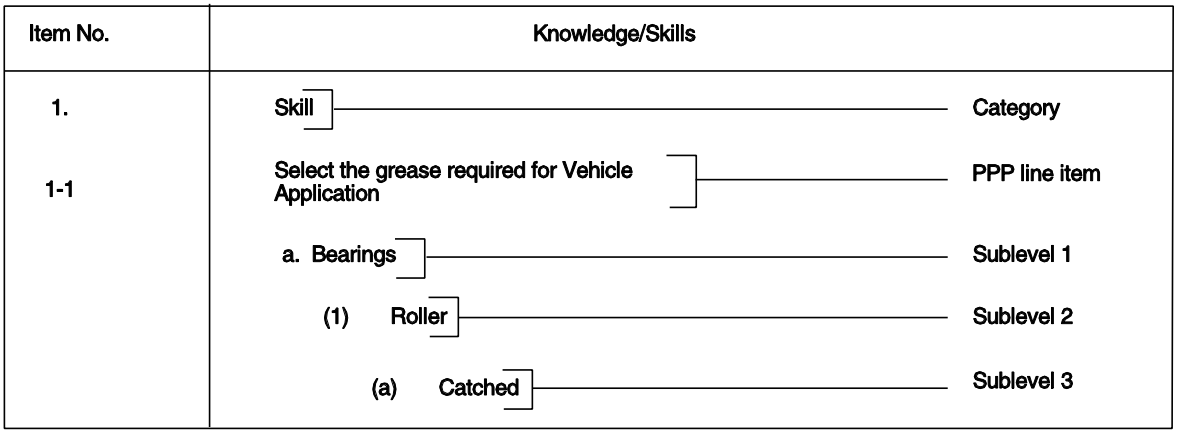
SECTION 6.0 DEVELOP YOUR BACKGROUND PPPs

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
	(a) 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



- 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 subitems of a line item
- Three subitem levels are allowed

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 130A: *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) - see the Background and Task/Function PPP table examples in Volume II, Tab A2
- 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”

6.1 T/F – B/G 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 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....

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*

Another equally viable approach is to begin 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

6.2 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”

> 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”

> 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 7.0 WHAT IS NEXT?

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.

> The Foreword and How to Use NAVEDTRA 131A contain guidelines for reading this manual – you should read them now if you have not already done so.

CHAPTER'S 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

> Step-by-step, the TPS helps to make such key decisions.

- 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 1.0 THE TPS IS

- 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 2.0 TPS ELEMENTS (OUTPUTS) ARE

- Training Objective Statements **(TOS)**
  - TOS describe skills and knowledge to be learned by the individual
- Training Level Assignments **(TLAs)**
  - 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
- Table Assignment Matrix **(TAM)**
  - The TAM summarizes the training requirements for PPP Tables listed on the TPC (see below) by showing all TOS associated with each PPP
- Training Path Chart **(TPC)**
  - A 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 3.0 TPS CHAPTER'S GOALS ARE

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

These decisions are

- 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?

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 4.0 WHO WILL BE TRAINED?

- ALL Navy personnel fit into one of three groups

> Course scope and content are *determined* by the group for whom the training is intended.

- The kind of work that is to be trained determines the personnel group that is selected

4.1 The three different groups of personnel are:

- 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: One 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 Craftmaster 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

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 5.0 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:

- *TRAINING OBJECTIVE STATEMENTS* **(TOS)**

> Use *canned*, or pre-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
- Perform TASK Set begins on page 4-23
  - You may then use each TOS as is, or add to it, or *amend* it, to better describe your training program—*Expanded*, amendable TOS are in the Volume I Supplement
  - 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

To make the last of this discussion easier to follow, take a few minutes now and study the each of the three TASK Sets and their individual TOS.

5.3 To describe a training program

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

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 A *TOS CODE* identifies each individual TOS

- 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 TRAINING LEVEL ASSIGNMENT (TLA) Form, exemplified in Volume II Sample Products
- The *letter* TOS Codes for skill are
  - T∅ (S)—Skill (Background)
  - T∅ (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
  - ∅ — 1 — 2 — 3 — 4

5.5 Using TOS Codes

- 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?

But, combine this PPP Line Item with a TOS code:
"Perform operation of the CUCV," **plus** the TOS Code O1

Now, the PPP Line item, **plus** the O1 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 O1 and O2.

Now, the PPP Line Item, **plus** the O1 and O2 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 that 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 TOS

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 I Supplement
  - 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, Trainee Guide and Instructional Media Materials

5.10 T0 TOS Category—IMPORTANT INFORMATION ABOUT THEIR USE

- The T0 TOS Category is used as a means of categorizing the Background and Task/Function TOS into a distinct and easily referenced unit. "T0" is primarily used when conducting formal instruction on the Training Path System for curriculum developers

- T0 *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 6.0 COORDINATE TASK SET
T0 B/G (BACKGROUND) AND T/F (TASK/FUNCTION)

6.1 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

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

SECTION 7.0 DIRECT TASK SET
T0 B/G (BACKGROUND) AND T/F (TASK/FUNCTION)

7.1 SKILL/KNOWLEDGE TOS

T0 – 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 to *DIRECT* 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 8.0 PERFORM TASK SET
T0 B/G (BACKGROUND) AND T/F (TASK/FUNCTION

8.1 SKILL/KNOWLEDGE TOS

T0 – 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

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:

- 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 9.0 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*. (See page 4-35.)

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

  - Also list the letter/number code of EACH PPP subitem that you want trained

  - A missing letter/number code indicates the PPP line item, or subitem(s) will not be trained

- Indicate TOS applicable to each PPP line item/subitem—

  - Write in the Training Level Assignment Applicability Indicators—refer to Page 4-35 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/subitem must have a Training Locator Indicator Code written beside it

- If two or more TOS apply to a PPP Line Item/Subitem

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

SECTION 10.0 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" refer to the PPP Chapter.

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

- First, select all Directly supporting knowledge PPP line items, as follows: "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 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

- Also, 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)

> See Volume II, TAB A-3, *TABLE ASSIGNMENT MATRIX (TAM)*, as you read the following discussion.

- 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 Task/Function and Background (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 11.0 WHERE WILL EACH SKILL/ KNOWLEDGE BE TRAINED?

Training Level Assignment 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

- When required, other Training Level Assignment Applicability Indicators may be devised if none of the above fit the training situation

SECTION 12.0 THE MEANING OF LETTERS AND NUMERALS

- As discussed in the preceding section, these codes are essential to TLA development
  - When entered onto a TLA, Training Level Assignment 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., Ø, 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 Ø, 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 13.0 WHAT WILL BE TRAINED, AND WHERE?

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 compete 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 chosen/developed to support your course—
  - You will also have one filled-in TAM

> Some developers may prefer to first prepare the TAM, and then the TLA. Either approach works equally well—it depends on the individual's preference.

SECTION 14.0 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
  - There are other courses that 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 Training Path Chart (TPC)?

> 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 Training Path Chart (TPC)

> See Volume II, TAB A-3, *Training Path Chart (TPC)*, for the following discussion.

- A Training Path Chart (TPC) results from the combination of—
  - PPP Table Index
  - Table Assignment Matrix (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 15.0 DOCUMENT SUMMARY

15.1 When all TPS elements have been developed

- The various documents are assembled in this order:
  - Training Objective Statements
  - Training Level Assignment(s)
  - Table Assignment Matrix
  - Training Path Chart
- 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 courses

- For such courses the following TPS elements are required
  - Training Objective Statements
  - Training Level Assignments
  - PPP Table Index

SECTION 16.0 WHAT IS NEXT?

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*
  - And, finally, you will prepare a profile item-to-topic objective assignment chart which enables each PPP line item to be tracked throughout the curriculum

Develop Job Sheets

- Even though developing Job Sheets is actually part of Trainee Guide 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 Training Path System you are ready to begin the next part of the Design Process: *Training Course Control Document* **(TCCD)** development.

The 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 *Training Course Control Document (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 to 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).

CHAPTER'S SCOPE

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

> Within Navy technical training there is a need to apply the rules of common sense when COI/TCCD/LP/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 Lesson Plan
- To describe the elements of the COI/TCCD
- To explain the step-by-step process for developing each element 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 1.0 THE TCCD IS

- 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

Function of TCCD and COI

- *Preparing the COI is a process that directly affects "teachability" 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 2.0 COMPOSITION OF THE PRELIMINARY TCCD

***Preliminary* TCCD includes these documents**

- *Profile Item-to-Topic Objective Assignment Chart* **(OAC)**
  - Reflects the coverage of PPP items within a curriculum
- *Resource Requirements List* (**RRL**)
  - Lists resources needed to conduct the course
- *Curriculum Outline of Instruction* (**COI**)
  - Describes the overall course outline and objectives

SECTION 3.0 COI ELEMENTS ARE

- *Course Learning Objectives* (**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 the latter two may be implied
- *Topic Learning Objectives* (**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
- *The Curriculum Outline of Instruction* (**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
  - Its 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 4.0 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 on pages 5-4 and 5-5

- When finished with the COI, compile all your documents in the order they are discussed in the following pages

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 5.0 REGARDING FORMAT

- It is not necessary that all Navy curricula look exactly alike, right down to the most minute 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 6.0 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 *Training Path System* **(TPS)**
  - Refer to the CLO Model Statements as you read the following discussion:

- Coordinate CLOs begins on page 5-14
- Direct CLOs begins on page 5-17
- Perform CLOs begins on page 5-20

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):
  - 1st—using the TOS column, note all TOS CODES which apply to the PPP
  - 2nd—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

- 3rd—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 Course Learning Objective page
  - Note that CLOs in the sample are organized in Lesson Plan 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:"

→ The PPP Tables become Parts
→ Skill CLOs become Skill Sections
→ 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 Training Objective Statements (TOS) 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

This ends the CLO discussion

CLO Model Statements start on the next page

SECTION 7.0 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, 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 *T0* (BACKGROUND) KNOWLEDGE CLO

T0 (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 *T4* TASK/FUNCTION KNOWLEDGE CLO

T4 (T/F) Knowledge
Demonstrate an understanding of the knowledge required to COORDINATE direction/performance of all task... or function... skills.

7.7 FAMILIARIZATION CLO

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

7.8 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 of the...

SECTION 8.0 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, 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 T0 (BACKGROUND) KNOWLEDGE CLO

T0 (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, Equipment]); (performance of... [task or function]); (receipt of... [further background training])

8.4 T4 (TASK/FUNCTION) KNOWLEDGE CLO

T4 (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 9.0 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 T0 (BACKGROUND) KNOWLEDGE CLO

T0 (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, Equipment]); (performance of... [task or function]); receipt of... [further background training.])

9.4 T4 (TASK/FUNCTION) KNOWLEDGE CLO

T4 (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 10.0 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 Titles
- Topic Learning Objectives (TLOs)

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 Curriculum Outline of Instruction/Lesson Plan (COI/LP) and each is divided into one or more Parts
  - Each Part may cover

    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, “teachability” 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

- 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

- The Part Number is derived from the PPP Table Number (for example; PPP Table Number is SØ136):
  - When the PPP is covered without interruption—

    SØ136

  - When coverage of the PPP is divided into two, or more, parts (called “split parts”)—

    SØ136/1 — 1st usage
    SØ136/2 — 2nd usage

  - When more than one PPP is covered in the part—

    SØ136

    This part contains information from PPP Tables AØØ74, BØØ76, SØ136, SØ137 and SØ138

    NOTE: Number displayed, e.g., SØ136 is that of primary PPP

- As you will see, parts are comprised of Sections
- Also, multiple Parts within a Lesson Plan are separated from one another by Tab Dividers
- The part number is placed on the “tab” of the Tab Divider, as follows—“Part SØ136”

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 Training Objective Statements 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

  - See following page

- 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 PREVENTIVE AND

P1/C1 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 Topic Learning Objectives (TLOs) are listed following each Topic title
- And a statement of rationale (optional) describing intended lesson content and goals may be included if necessary
- See Volume II, TAB 4A 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
  - See following pages
- 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 (an exception is shown on page 5-28)

- 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

T0 – Understanding of ____
T4 – Application of ____

10.9 Prepare the TLOs for your course

(See Volume II, TAB A-4)

- TLOs—TOPIC LEARNING OBJECTIVES—reflect the coverage provided in the Topic by using those PPP line items identified by the TLA:
  - Applicable PPP subitems 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 are listed on pages 5-37 and 5-38 for 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 130A, "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 assume

  - *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"

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"

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

  - NOTE: Do not imply the condition unless it is possible to infer the level of training required

- The next example contains all three TLO elements

Perform calibration procedures *for preventive maintenance* **on the ABC meter**, using OP YYYY. The meter must be accurate to 1 millivolt 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 11.0 HARDWARE TOS-DETERMINED CONDITION STATEMENTS

TOS INDICATOR

F1 ...to support general duties for...

OR

...general watchstanding duties...

T1 ...to support normal operation of...

T2 ...to support casualty/degraded/abnormal modes of operation of...

OR

...to support operation requiring advanced analysis of...

OR

...to support preventive maintenance of...

OR

...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 12.0 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...)

T0 (B/G) ...in accordance with (prescribed documentation for...), (*name of documentation...*), (to support the PREREQUISITE [Background] Skills of...), (or other appropriate condition or modifier...)

T4 (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 more definite guidance 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)*" TLO 1. 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***. 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 subitems of a PPP item are not applicable to the same TLOs, the subitems covered must be listed separately. In some cases, a PPP item or subitem 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 subitem is T∅, 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 subitem is covered

- **LRNG OBJ** column—specifies the TLO which relates to the PPP item or subitem

- **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., Lesson Plan and Trainee Guide) 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:

    1. Technical training equipment by Mk, Mod, and official name

2. Specialized test equipment and instructional tools such as mock-ups and models

3. Computer terminals supporting computer-based instruction and Interactive Courseware (ICW)

4. Common hand tools and general purpose test equipment—those given a group listing in technical manual are listed by group name rather than individually

5. Prefaulted modules

- *Films*. Also includes videotapes and videodiscs

- *Graphics*. List transparencies, wall charts, slides, photographs, etc., and Interactive Courseware (ICW)

- *Support materials*. All instruction sheets NOT 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 13.0 PREPARE THE FINAL TCCD

You will recall that

- The TCCD (Training Course Control Document) 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

13.1 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 form of the Curriculum Outline of Instruction

13.2 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.

13.3 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 Training Project Plan'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 18Ø68."

  1. Additional physical requirements may be imposed by specialty groups (aircrew, SEALS, diver, etc.) which involve many ratings. See "*Navy Military Personnel Command (NMPC) Manual*, Article 183Ø18Ø."

  2. 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

13.4 Incorporate the Curriculum Outline of Instruction

- The COI is placed exactly as compiled earlier into the TCCD, where indicated by the sample TCCD shown in Volume II of this Manual

- NOTE: Include all new or modified PPP Tables, PPP Table Index listing existing PPPs used, and the Training Path System, for the course to facilitate review and approval of the TCCD

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

SECTION 14.0 WHAT IS NEXT?

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)**
  - Develop in accordance with CNETINST 1540.13
  - 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 and 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

- Using all elements of the TCCD you've just finished, especially the COI, you will develop the curriculum to include: Lesson Plan – Trainee Guide – Instructional Media Materials

- Where the Lesson Plan is concerned, you will find all the hard work behind you, because the COI *is* most of the Lesson Plan

  - 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 is 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* **(LPs)** for instructors. Following chapters will discuss the remaining training materials designed to supplement the instructor's presentation or to assist the trainee.

> The Foreword and How to Read NAVEDTRA 131A contain guidelines for reading this manual–you should read them now if you have not already done so. Development of the *Lesson Plan, Trainee Guide* 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**

CHAPTER'S SCOPE

- Specify the minimum content and format requirements for a Lesson Plan
- Discuss the three instructional strategies most commonly used in Navy courses
- Provide step-by-step procedures for developing the Lesson Plan and associated Lesson Topics

SECTION 1.0 THE LESSON PLAN

- Provides specific definition and direction to the Instructor on training objectives, equipment and support material requirements, and course conduct
- Programs the use of all other training materials
- Contains *Learning Objectives* **(LOs)** that reflect the skills and knowledge to be 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 support material requirements, and guidance for conducting the course

SECTION 2.0 LESSON PLAN ELEMENTS ARE

- Front Matter
  - Provides essential information both for managing and conducting the course
- *Parts*
  - The primary organizational element of the Lesson Plan, based on the *Personnel Performance Profile* **(PPP)** Tables to be taught in the course
- Resource Requirements List (Optional)
  - A list of everything required to conduct the course
- Figure 6-1 on the following page shows those elements which usually comprise the Lesson Plan

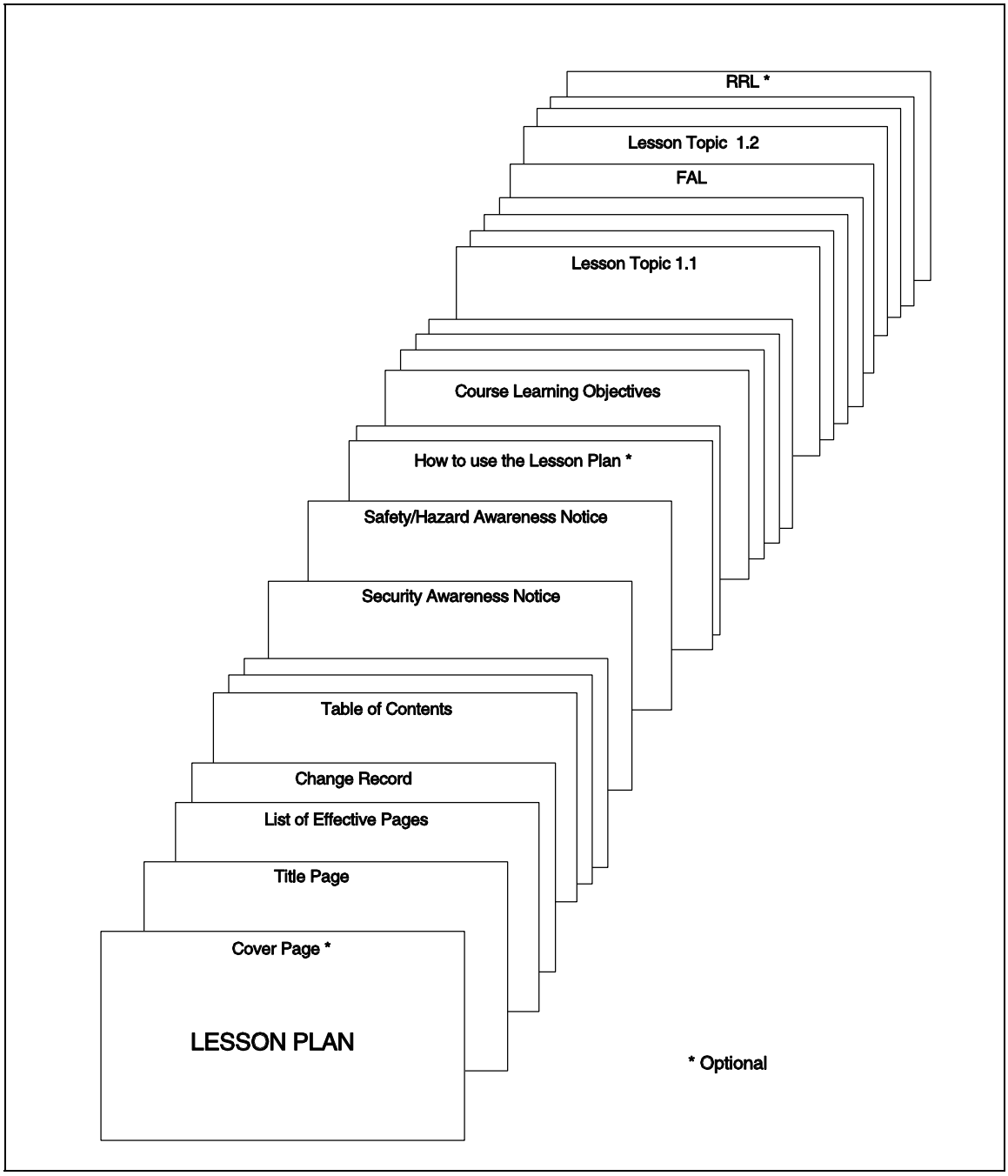


FIGURE 6-1: LESSON PLAN ORGANIZATION

SECTION 3.0 REGARDING FORMAT

- It is not necessary that all Navy curricula look exactly alike, right down to the most minute 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, for example:

  - Certain words are always capitalized, underlined, placed in parentheses, all lower or uppercase, or end with the same punctuation

  - Top/bottom and right/left margins are set at 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 that is always identical, pages that mirror other, similar pages

The rule of "common sense" must apply

- If the document is "instructor friendly" and looks basically to be the same as others of its type, it should be acceptable

3.1 CCA will provide guidance

- The *Curriculum Control Authority* **(CCA)** will determine the degree of format flexibility allowed

In most cases detailed format specifications have been omitted from this Chapter. Format conventions may be obtained by going to the appropriate sample course in Volume II.

SECTION 4.0 DEVELOP FRONT MATTER

Front matter elements are

- Cover (Optional for all)
- Title Page
- List of Effective Pages
- Letter of Promulgation (Optional for non-submariners)
- Change Record
- Table of Contents
- Security Awareness Notice
- Safety/Hazard Awareness Notice
- How to Use the Lesson Plan (Optional for non-submariners)
- Allocation of Instructional Time (Optional for non-submariners)
- Course Master Schedule (Optional for submariners)
- Course Learning Objectives

USE OF SAMPLE LESSON PLAN

Located in Volume II at Tab A-5, the sample LP provides for the "eyeball" approach to LP formatting, where you place data on the page so that it appears to be located in the same place as in the sample LP.

4.1 Cover (optional)

- Is printed on heavy paper stock or equivalent material
- Is optional at the direction of the *Curriculum Control Authority* **(CCA)** or *Course Curriculum Model Manager* (**CCMM**)
- An identification seal, which is optional, may also be added

4.2 Title Page

- This provides for easy identification of the course, including information regarding revisions and changes
- Month and year that the Lesson Plan is prepared, or revised, is a publication date and may differ from the approval letter date

4.3 List of Effective Pages (LOEP)

- The LOEP identifies the change status of all pages in the volume
- Each time a revision, change, or technical change is authorized the LOEP is replaced with a listing updating its status

4.4 Letter of Promulgation (optional)

- This must be retained in the TCCD, and MAY be placed in the LP, if the CCA/CCMM wishes

4.5 Change Record

- This provides space for recording information related to each change incorporated into the LP after it is approved for implementation

4.6 Table of Contents

- In Volume 1 provide a complete listing of the contents of all volumes in the LP
- In following volumes, only the Lesson Topics contained in that volume are listed

4.7 Security Awareness Notice

- Describes procedures for handling and safeguarding classified materials used in the course
- Refer to OPNAVINST 5510.1, "Security Program Regulations" to ensure all training materials are marked and handled in accordance with the latest policy guidance
- Each LP shall bear the highest security classification demanded by its contents
- You, as the developer, must state whether or not the course contains any classified material

4.8 Safety/Hazard Awareness Notice

- Identifies hazards to personnel and equipment
- Provides special directions to personnel concerning safety
- Provides safety precautions for protection of personnel and equipment

Refer to NAVEDTRA 135A and CNETINST 1550.20 on Training Safety to ensure incorporation of the latest policy guidance in the Notice.

- Provides instructions for reporting safety and hazard violations
- Is tailored to the specific safety requirements and hazards found in the course
- Identifies relevant documentation containing specific precautions and preventive measures
- If applicable:
  - Provides specific policy on “Training Time Out (TTO)”
  - Provides specific policy on “Drop on Request (DOR)” for designated “Volunteer High Risk Courses”
  - Describes the purpose of “Pre-Mishap Plan”

Security/Safety/Hazard Awareness Notices must be written to reflect the individual course. Security/Safety/Hazard requirements must be incorporated throughout the course, wherever they must be restated.

4.9 How to Use the Lesson Plan (Optional)

- This describes the composition, function, and use of the LP, and provides curriculum support directions
- If used, this information must be tailored to meet the specific needs of the curriculum

4.10 Allocation of Instructional Time

- Topic times are one of the most critical data elements available within the curricula. Topic time is used by course/school managers to coordinate and manage multiple resources

- Topic times are established and validated during Stage 4, the COURSE PILOT. Topic times are then entered on the top of each Topic Page for quick and easy reference by the instructor. Topic times are also listed in the curriculum Front Matter on the *ALLOCATION OF INSTRUCTIONAL TIME* page for use as a complete inventory of curricula times (i.e. Classroom Hours, Laboratory Hours by Volume, Part, Section and Topic and the Total Instructional Time, Total Testing Time, Total Review Time and, therefore, the Total Course Time). Topic times will reflect the time required to correctly present a topic at the proper TOS level because the Pilot process validates the course using the target population and a predetermined class size. Information regarding the pilot class size and student/instructor ratio used during the pilot is also located on the AOIT page

- Topic times, in the curriculum, serve as a *BENCHMARK* for the instructor to use to help determine if the instruction is proceeding at the intended pace. These topic times are "FIXED" and should not vary from class to class by more than 10 percent. Should time variances greater than 10 percent occur repeatedly the topic should be monitored for time and formally changed accordingly

- Topic times and the information on the Allocation of Instructional Time page is static and shouldn't vary. Scheduling of the course using the Course Master Schedule and its associated Master Schedule Summary are dynamic and can vary from class to class and can differ from site to site due to differences in class loading, lab/trainer configuration and other scheduling variables

- The data located on the Allocation of Instructional Time page serves as a source of management information used to schedule courses and school resources (i.e. instructors, classrooms, laboratories, planned hardware/trainer maintenance, trainer upgrades, etc) and to report course and resource information to higher authority using Master Course Reference Files (MCRF) and the Navy Integrated Training Resources and Administration System (NITRAS). CNET INSTRUCTION 1540.13 refers

4.11 Course Learning Objectives

- The CLOs are taken directly from the COI in the TCCD and must match exactly the CLOs in the COI as to content and sequence

SECTION 5.0 DEVELOP PARTS

Part elements are

- Tab Divider
- Section Page(s)
- Topic Pages
- *Discussion—Demonstration—Activity* **(DDA)** Pages

NOTE: This chapter *does not* discuss Tab Divider and Section Page(s)—see instead TCCD, Chapter 5 for an in-depth discussion of these two elements, including the following: Sections - Lesson Topics - Lesson Topic Learning Objectives.

Note also: A *Lesson Topic* results from combining Topic Pages and Discussion—Demonstration—Activity (DDA) Pages.

5.1 Topic Pages

- List number of "Periods" required to conduct the class and/or laboratory exercise without consideration of bottle-necks or other constraints
- List Topic Learning Objectives (TLOs)
- Describe Trainee preparation
- Describe Instructor preparation
- Periods

- Fractions of a period are not usually shown; if a period has a classroom and/or a laboratory exercise, list only that which is applicable

- If it is necessary to show fractions of a period, they will be shown as quarters of a period, e.g., 1.25, 1.5, 1.75 hours, etc., with each 15 minutes representing one-fourth of a period. Standard mathematical rules of rounding up/down will be followed

- TLOs

  - List them in the order they are intended to be taught

  - Must be consistent with the TCCD both in content and sequence

  - May modify the TLO introductory phrase "Upon successful completion of this topic, the trainee will be able to" by adding the *condition* phrase from the *Training Objective Statement* **(TOS)** if all TLOs on the topic page have the same one(s)

- **Trainee Preparation**. List all materials that must be studied in preparation for the topic under the following subheads:

If no materials are required, the word "none" is inserted under the subhead. Also, usually there is no trainee preparation for the first day of any course of instruction.

  - *Trainee Support Material*. List each instruction sheet (or other support material) to be studied by the trainees prior to beginning the Topic

  - *Reference Publications*. List all material to be read by the trainees prior to starting the Topic. List references by: identification number, publication number, complete title and source (if not obvious from the number/title)

- As a rule:

  Publications listed here are also listed under “Reference Publications” of Instructor Preparation

  Trainee Preparation Materials are also listed under “Assignment” of the preceding topic, and as a “refer to” in the *Related Instructor Activity* **(RIA)** Column

- Instructor Preparation

  - *Review Assigned Trainee Materials*. Reminds the instructor of this important factor.

  - *Reference Publications*. List all references cited as “refer to” or “reference” in the RIA column, including the same data as required for Trainee Preparation

Only those references cited in the RIA column are ordinarily listed under “Reference Publications”

  - *Training Materials Required*. List all *Instructional Media Materials* **(IMM)**, and other materials, required for Topic presentation, e.g., publications, wall charts, transparencies, *Interactive Courseware* **(ICW)**, etc., giving each category a separate heading, as appropriate

5.2 DDA Pages

- Outline the subject matter in sufficient detail to support the Topic Learning Objectives

- Provide the instructor with adequate direction to guide him in his presentation of the subject matter

- DDA Pages consist of two elements:
  - Discussion Point column
  - Related Instructor Activity column
- **Discussion Point (DP) column**. Lists all DPs, and sub-points, in correct instructional sequence—this is usually the same as PPP and TLO sequence:
  - For Topics which include labs involving equipment, the first DP will include a review of **Training Time Out (TTO)** procedures if applicable
  - For those courses designated "Volunteer High Risk" the first DP *only* of the first Topic will review **Drop on Request (DOR)** procedures
  - The first DP of each lesson may be introductory in nature and include DPs such as: "Review TLOs," "Topic Overview," "Motivational statements" on subject matter importance
- DPs may range from being nothing more than a skeletal outline (minimal level of detail) to that where little research of the technical documentation is required
  - DPs normally will be key words or phrases only — and are usually prepared by outlining the TLOs
  - Adequacy of technical documentation, volatility of the subject matter, anticipated instructor knowledge/expertise of the subject matter, command preference—all are factors which influence the amount of detail provided in the DP column

NOTE: A skeletonized outline is less likely to require change whenever the technical documentation changes.

- *Compensating for inadequate technical documentation* — Provide enough information in the DP column of the DDA pages so no reference is required, or develop a reference to support the DP
  - This reference should be a Trainee Guide Information Sheet. Do not use a Trainee Guide Information Sheet if its only purpose is to provide a reference source for LP personalization.
- DPs will not exceed four levels, as follows:

  3.
  a.
  (1)
  (a)
- There will be ample space between DPs for instructor personalization of the topic
- A "Review and Summary" major DP is included in knowledge topics and a "Critique" major DP in skill topics— these DPs are not normally submitted
- The final DP in all but the last topic is "Assignment"
- **Related Instructor Activity (RIA) Column**. Gives specific directions to the instructor with specific regard to his and the trainee's behavior:
  - The RIA is identified in the same manner as the corresponding DP
  - Oral discussion is necessary for each DP, though entries directing oral discussion should not be entered in this column
- **Reference** ... used to aid the instructor in locating information needed to personalize for a particular DP
  - IT IS NOT intended to direct the instructor to use that reference material in the classroom

- The first time the reference is listed in the RIA column list it by complete number and title

- **Refer to** ... provides direction for the instructor when the reference material is actually intended for classroom use

- When the trainee must use these same materials, various phrases may be used as long as the intent is clear, for example: **Trainee refer to** ..., **Refer trainee to** ..., **Instructor refer trainee to** ..., **Refer to** ... **(trainee only)**, etc.

- **Display** ... directs the instructor to use a particular IMM, as referenced by its alpha-numeric identifier/title

- **Demonstrate** ..., **Show** ..., **Point to** ..., **Display** ..., **and so forth** ..., **etc**., may also be used to tell the instructor what actions are required. Identify any unique approach that may be necessary to teach the lesson

- **Review as Required** ... used to indicate points in the topic where the instructor may wish to gauge the trainees' comprehension by class discussion

- **Documentation References**. Identify the document supporting the DP: document number, volume, part, and paragraph, page, or figure number, as applicable. (Paragraph, rather than page numbers, are used whenever possible.)

  - Once the complete document reference has been stated, further mention of the reference may be by partial reference name so long as the correct document reference is clearly implied

  - The following shows first and subsequent usages of a reference document within a topic:

Related Instructor Activity

1. *Refer to OP 3671, Vol. 2, Part 1, figure 1*.
2. Display Transparency 314-1-2-1.
3. *Refer to figure 2*.
4. *Refer to Part 2, table 1-1*.
5. Refer to OP 3666, paragraph 2-3.4.2.

- **Transparencies/Slides**. Describe those to be used; include directions on their use if the lesson requires a unique teaching approach; indicate slide/transparency use by phrases such as: **Display Transparency** ...; **Display Slide** ...; **Continue displaying transparency** ...; etc., listing the alpha-numeric designator on the media's frame

- **Lecture Guide**. When used, directions on slide use are not required

- **Diagram(ming)**. Describe development of a block diagram, etc., on the chalkboard

- **Films**. Describe what film to project and when

- **Support Materials**. Identify what other support materials should be distributed and/or how they should be used

- **Lab/Equipment**. Direct the instructor in starting up and shutting down the equipment/laboratory, and safety precautions that require positive instructor action

- **Fault Isolation Exercises**. Provide directions for conducting the exercise(s). Include the fault alpha-numeric identifier if listed in the Pre-Faulted Module. Also indicate faults inserted by switch panels, software, etc. Identify the applicable fault description document number(s)

  - Sequence fault isolation exercises so that the average trainee can progressively develop his skill performance to at least the minimum standard required

  - When C1 faults must be used as C2 faults, only C1 faults approved for C2 use are allowed. (These faults are indicated as C1 *and* C2 in the fault user's manual, which may also list additional directions on fault use under "WARNINGS/CAUTIONS/NOTES." These directions may be modified for the LP, but the intent must remain

- Instruction Sheets. Direct the instructor on their use the classroom/laboratory: Direct trainees to perform Job Sheet ..., Refer to Diagram Sheet ..., Distribute Information Sheet ..., etc.

- Answer Key. Provide answers to questions on job sheets, assignment sheets and problem sheets at the appropriate point . For fault-related questions reference the users' document when it has the correct answers

- Note-taking. Provide special instructions for note-taking during presentation of classified materials

- Review as Required. This entry indicates that the amount of discussion for the DP will depend on the class level. The entry is not meant to imply that discussion of the DP is optional

- Assignments. Reminds the instructor to determine necessary study assignment(s) if the trainees are to understand materials already covered or to be presented. Decisions regarding assignments are made on a daily basis according to the class' performance level and the topics planned for the following day

- Tests. Indicate testing points in the Topic, use of the “Test Administrator's Guide,” etc.

- The RIA Column is not restricted to the use of the phrases and examples discussed above. Other explanatory phrases, examples, notes, etc., may be used in the RIA Column as required. Those discussed above, however, have proven to cover most classroom/laboratory training situations and, hence, to be the most helpful

SECTION 6.0 DEVELOP REFERENCE MATERIALS

- Reference Materials are a component of the Training Course Control Document— They may also be included as an annex to the Lesson Plan, *at CCA/CCMM discretion*

- In this case, Reference Material includes:

  - *Resource Requirements List* **(RRL)**

  - *Profile Item-to-Topic Objective Assignment Chart* **(OAC)**

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

- Reference Material will be located immediately behind the last Topic in the Lesson Plan

  - For multi-volume Lesson Plans, the Reference Materials for each volume is located behind the last Topic in the last volume

  - For the FAL, the approval FAL will be placed behind the lesson topic for which it applies

- Chapter 5, TCCD, provides directions for developing all Reference Materials

SECTION 7.0 7-STEP METHOD TO LP DEVELOPMENT

- Some developers can use the content and format guidelines presented in previous sections to develop new or revised LPs or individual Topics. The "7-Step Development Plan" is made available if a more structured approach is desired

- The seven steps are:

  - Review Learning Objectives
  - Review technical documentation
  - Organize individual Topics
  - Choose or develop Instructional Media Material (IMM)
  - Prepare initial Topics/Lesson Plan
  - Conduct Pilot
  - Finalize Topics/Lesson Plan

STEP 1 – REVIEW THE LEARNING OBJECTIVES

Review the TPS and COI to determine

- Level(s) at which the objectives are to be taught
- CLOs and TLOs
- Course sequence
- Any modifications that may be required to the objectives or their sequence

Objectives may require modification because

- The costs associated with performance objectives are 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

Topics may require resequencing because

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

If the preliminary TCCD has been approved

- The CCMM can approve objective resequencing and minor word changes
- The CCMM may also approve changes which do *not* effect CLOs, course length, or resources
- The CCA must approve those changes which *do* effect CLOs, course length, or resources
- All changes to CLOs/TLOs, Topic titles or sequence must be incorporated into the TCCD

When finalized, CLOs/TLOs in the TCCD must be in the same sequence as those in the implemented course.

STEP 2 – REVIEW THE TECHNICAL DOCUMENTATION

Determine the main points to be included in the topic

- These main points may need to be added as DPs, or it may be appropriate to leave these for instructor personalization
- Information must support the CLOs/TLOs
- Information must also aid both instructor and trainee in the teaching/learning process

Lesson Topic development should always begin with the latest reference material, but the developer's own Rating/MOS experiences, and the experiences of other Subject Matter Experts should also be considered.

STEP 3 – ORGANIZE THE INDIVIDUAL TOPICS

Organizing an individual Topic requires

- Development of the content outline
- Selection of an instructional strategy
- Determine order of presentation of the DPs

Develop a content outline to support the objectives

- Begin by outlining the TLOs – normally their behavior elements become the outline's elements

- Develop subheads to support these elements – usually these are subitems of the TLO

> The preferred Topic is that where the only DPs are those derived from outlining the TLOs, and referring the instructor to the reference for personalization, thus resulting in a **skeletonized outline**.

- Add additional DPs if more detail is required— These DPs are often identified in Step 2 above, during a review of the technical documentation

DETERMINE ORDER OF PRESENTATION OF THE DPS

- DPs may be arranged in the same order that the events/steps occur, or in the order that they are performed

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

- DPs may also be arranged according to some directional strategy: top-to-bottom, bottom-to-top, from-center-to-the-outside

> **EXAMPLE**: Discuss an aircraft's control panel by describing, first, those instruments in the center most often used, then moving out toward the surrounding instruments which are least often used.

- DPs may be ordered 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 arranged to show that a problem exists and then offer 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 sequenced to be for—against a subject, or by advantages-disadvantages of an event, and providing fairly even attention to both sides

> **EXAMPLE**: Discuss the various Naval strategies.

- DPs may be arranged to describe categories of things such as classes and components

> **EXAMPLE**: Discuss various ship classes of the U.S. and Soviet Navies.

Before revising or developing a Topic: Review existing material—look for other Navy courses, and other military/government agencies which teach the same subject, or use the same equipment—Select what is applicable.

SELECT AN INSTRUCTIONAL STRATEGY

Strategies used most often in the Navy are

- Lecture
- Lecture with Instructional Media Material (IMM)
- Demonstration

The Lecture is

- A vocal presentation of information, concepts or principles by an individual to a group of listeners

EXAMPLES: Skill, knowledge, or values' orientation, teaching fundamental facts and terminology.

Lecture with Instructional Media Materials (IMM)

- Is the most commonly-used Navy instructional strategy

EXAMPLE: Teach equipment operation by using transparencies and a mock-up, or the actual equipment.

IMM 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

A 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

> **EXAMPLE**: Show the effects of acids on metals by pouring hydrochloric and sulfuric acids on a variety of metals.

Demonstration/Practice is usually used

- A demonstration is presented by the instructor; this is followed up by some type of repetition, after which all trainees practice what has been demonstrated
- Repetition reinforces the demonstrated action.

Types of repetition include

- *Instructor Repetition*
- *Trainee Repetition*

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

Trainees always practice under supervision

- Until they have attained the required proficiency
- Afterwards, they are usually evaluated by a performance test

A topic may use multiple strategies

- Such as incorporating theory and a demonstration into the same Topic

> Role-playing, Case Study and Discussion are other instructional strategies which have specialized use in Navy training.

STEP 4 – CHOOSE/DEVELOP IMM

Use IMM in a 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 IMM for application to the Topic

- Consult *Defense Audio-Visual Information System* (**DAVIS**) and the *Defense Instructional Technology Information System* (**DITIS**) for a list of existing IMM and *Interactive Courseware* (**ICW**) which might support the Topic
- Review technical documentation for possible illustrations
- Review material used in other courses teaching similar subject matter

> Whatever the instructional media selection,
> it must support and help achieve the CLOs/TLOs.

STEP 5 – PREPARE INITIAL TOPIC/LESSON PLAN

Prepare a Topic draft

- Use of electronic media in preparing the Topic/Lesson Plan 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 135A to ensure compliance
- Use classified material *only* when absolutely necessary
- Coordinate quality assurance assistance review with the Curriculum and Instructional Standards Office (CISO) or Quality Assurance Officer

- Coordinate review of instructional materials by the CCA, if appropriate

> Volume III of this manual and NAVEDTRA 135A give specific guidance on managing curriculum development.

STEP 6 – CONDUCT PILOT

The pilot may include

- The entire course
- Or it may cover only a major segment of the course—usually at least one Part or Section in length
- Review material for correctness and completeness
- The pilot itself will determine if the trainees have learned what the objectives called for

STEP 7 – FINALIZE TOPIC/LESSON PLAN

Revise and prepare

- The final drafts of the Lesson Plan, Trainee Guide, and all support materials including tests and IMM

> Any change to the topic sequencing or titles must be reflected in the TCCD.

SECTION 8.0 LESSON PLANS

- When necessary, may be organized into one or more volumes— at approximately 200-page intervals
- Subsequent volumes will repeat only those Front Matter elements which are necessary for understanding and use of the volume
- 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 Plan material

  Number **Front Matter** pages:

  - Consecutively using lower case Roman numerals
  - Number is placed in the lower right-hand corner of each page
  - No number is placed on the Cover
  - A number is not placed on the Title Page; although, it is counted in the numbering of the Front Matter as page 1
- The page number is a four-element number:
  - First element – Part number
  - Second element – Section number
  - Third element – Lesson Topic number
  - Fourth element – sequence number within the Lesson Topic

SECTION 9.0 TRAINING MATERIALS MODIFICATIONS

- If components of a Lesson Plan are revised as part of a Revision, “Rev” and an alpha character, starting with “A” for the first Revision, will follow the CIN on the title page. No entry will be made on the Change Record Page. However, each revised page will be marked with the "Rev" and alpha character indicators. Revisions are discussed in Volume III Chapter 8 and requires the submission of a TPP

EXAMPLE: A-433-0023 Rev A

- If components of a Lesson Plan are changed, as a part of a Change or Technical Change, the term “Chg”, with a number starting with 1 for the first change, will follow the CIN on every page affected by the change. Affected pages will be entered on the Change Record Page. Changes are entered on the Change Record Page. Changes and Technical Changes are discussed in Volume III, Chapter 8

EXAMPLE: A-433-0023 Chg 1

- Interim changes are entered by the instructor as pen and ink changes. The entry is noted on the Change Record. The CCMM will retain all Interim Changes for inclusion in later Revisions or Changes as appropriate. Interim Changes are discussed in Volume III, Chapter 8

SECTION 10.0 PRINTING

Single-sided or double-sided page printing may be used

- Courses likely to incur frequent page changes because of changing technical documentation should probably be printed single-sided
- Courses expected to incur infrequent page changes, because of relatively static technical documentation should probable be printed double-sided
- Factors such as ease of use from the podium, expected total number of pages, command preference, and so forth, may also apply

SECTION 11.0 WHAT IS NEXT?

- You will develop the Trainee Guide and Support Materials, such as IMM, Exercise Controller Guide (if required), On-the-Job Training Handbook (if necessary), and other such support materials as may be necessary

- This is your best opportunity, of any place in this entire curriculum development system, to be creative—EXERCISE IT!—and make the training materials as interesting and as informative as you can for the Trainees

- Within the constraints set by the CCA/CCMM, use a variety of IMM and/or other Support Materials—try not to use transparencies only to the exclusion of all other IMM

- Use the IMM Selection Model in Chapter 9 of this manual— It will help you to identify the IMM that is truly best for a particular training situation

- By this time, Job Sheet development should either be well underway, or perhaps even finished—you will recall that you were advised, after having finished with development of the PPPs and TPS, to begin developing the Job Sheets

- By this time, also, you are nearing the end of what has probably been for you a long and arduous (but, hopefully, enjoyable and educational) process

STAGE THREE

CHAPTER 7

TRAINEE GUIDE

INTRODUCTION

The curriculum developer is responsible for ensuring that the instructor and the trainees use their time to the maximum advantage. Training materials are a reflection of the curriculum developer's skills, knowledge, and understanding of the subject matter, and his/her choosing of that instructional strategy which he/she believes will best guide the trainees to achieve the stated learning objectives. To ensure uniform coverage of the subject matter, the Lesson Plan is developed to guide and direct the instructor.

Through the use of various materials/aids, the curriculum developer directs the trainees to supplementary material, structures their note taking, replaces abstract ideas with concrete images, and must provide them, if possible, with the opportunity to practice/apply their newly acquired skills and knowledge. Within Navy schools these materials/aids fall into two broad categories: *Instructional Media Materials* **(IMM)** and Instruction Sheets contained in a Trainee Guide. IMM is discussed in Chapter 9, while this chapter is devoted to Instruction Sheets and the Trainee Guide. A Trainee Guide leads the trainee through the course/lesson topic just as the Lesson Plan guides the instructor.

The Foreword and How to Read NAVEDTRA 131A contain guidelines for reading this manual–you should read them now if you have not already done so. Development of the *Lesson Plan, Trainee Guide* 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.**

CHAPTER'S SCOPE

- Describe the organization and contents of a **Trainee Guide**
- Describe the purpose and use of the six types of **Instruction Sheets**

The Trainee Guide may be used to:

- Provide supplementary information needed to successfully complete a course
- Provide information not readily available in reference publications at a level required for instructional purposes
- Provide problems to complete, or a series of steps to be performed, which require trainees to apply what they have learned
- Ensure the trainees have an opportunity to practice the most appropriate job-related experience

SECTION 1.0 THE TRAINEE GUIDE

- Is the primary trainee material
- Contains skill and knowledge objectives the trainee is to attain upon successfully completing the course
- Provides an outline of instructional material in a logical and efficient manner

SECTION 2.0 TRAINEE GUIDE ELEMENTS

- Front Matter
- Instruction Sheets
  - The six types of instruction sheets are:

    Job – Information – Assignment – Problem – Diagram – Outline

> Occasionally, both individual instruction sheets and a Trainee Guide will be used due to security requirements or changes in equipment or procedures.

- Figure 7-1 on the following page shows those elements which usually comprise the Trainee Guide

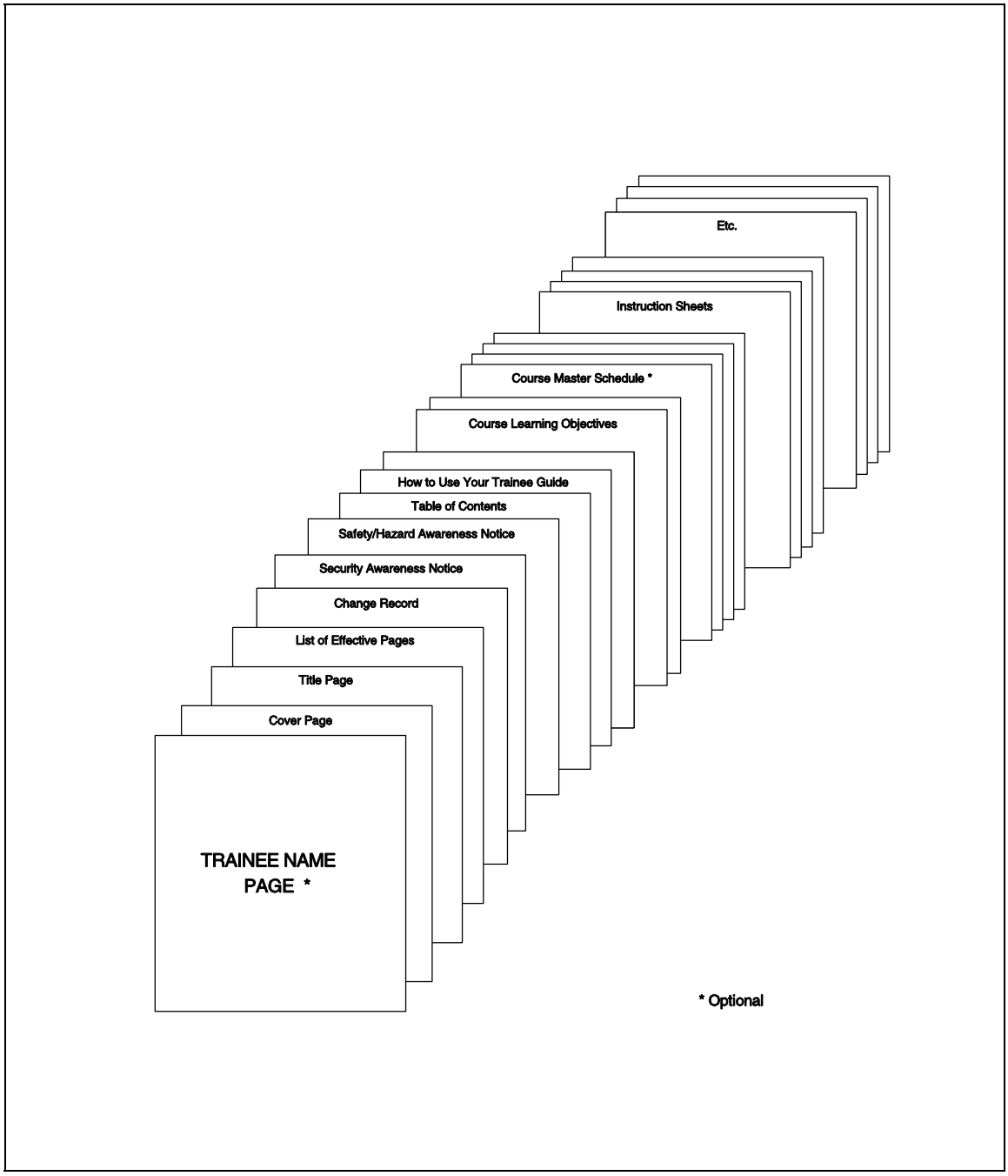


FIGURE 7-1: TRAINEE GUIDE ORGANIZATION

SECTION 3.0 REGARDING FORMAT

- It is not necessary that all Navy curricula look exactly alike, right down to the most minute 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, or underlined, or placed in parentheses, or all lower- or all upper-case, or end with the same punctuation
  - Top/bottom and right/left margins are precisely the same to one-tenth inch, repetitious data within the document is always placed identically, to the nearest one-tenth inch, font style that is always identical, and pages that mirror, similar pages

3.1 The rule of "common sense" must apply

- If the document is "trainee friendly" and basically looks to be the same as others of its type, it should be acceptable

3.2 CCA will provide guidance

- *The Curriculum Control Authority* **(CCA)** will determine the degree of format flexibility allowed

NOTE: In most cases detailed format specifications have been omitted from this Chapter. This guidance may be found by going to the appropriate sample course.

SECTION 4.0 DEVELOP FRONT MATTER

4.1 Front Matter elements are

- Trainee Name Page (Optional)
- Cover (Optional)
- Title Page
- List of Effective Pages
- Change Record
- Security Awareness Notice
- Safety/Hazard Awareness Notice
- Table of Contents
- How To Use Your Trainee Guide
- Course Learning Objectives
- Course Schedule (Optional)

USE OF SAMPLE TRAINEE GUIDE

Located in Volume II at Tab A-6, the sample TG provides for the “eyeball” approach to TG formatting, where you place data on the page so that it appears to be located in the same place as in the sample TG.

4.2 Trainee Name Page

- Is optional at the CCMM's or the CCA's direction
- Is used to track copies or to hold a trainee accountable for the volume
- If required, the Trainee Name Page provides space to record:
  - Between 5 and 10 trainee names
  - Class number
- Each volume may have a Trainee Name Page or only those volumes which must be controlled may have the Name Page

4.3 Cover

- Is optional at the CCMM's or the CCA's direction
- An identification seal, which is optional, may also be added
- Is printed on heavy paper stock, or equivalent material

4.4 Title Page

- This provides for easy identification of the course, and includes information regarding revisions and changes
- Month and year that the Lesson Plan is prepared, or revised, is a publication date and may differ from the approval letter date

4.5 List of Effective Pages (LOEP)—

- The LOEP identifies the change status of all pages in the volume

- Each time a revision, change, or technical change is authorized the LOEP is replaced with a listing updating its status

4.6 Change Record

- This provides space for recording information related to each change incorporated into the TG after it is approved for implementation

4.7 Security Awareness Notice

- Describes procedures for handling and safeguarding classified materials used in the course
- Refer to OPNAVINST 5510.1, "Security Program Regulations" to ensure all training materials are marked and handled in accordance with the latest policy guidance
- Each TG shall bear the highest security classification demanded by its contents
- The developer must state whether or not the course contains any classified material

4.8 Safety/Hazard Awareness Notice

- Identifies hazards to personnel and equipment
- Provides special directions to personnel concerning safety
- Provides safety precautions for protection of personnel and equipment

Refer to NAVEDTRA 135A and CNETINST 1550.20 on Training Safety to ensure incorporation of the latest policy guidance into this Notice.

- Provides instructions for reporting safety and hazard violations
- Is tailored to the specific safety requirements and hazards found in the course
- Identifies relevant documentation containing specific precautions and preventive measures
- If applicable:
  - Provides specific policy on “Training Time Out (TTO)”
  - Provides specific policy on “Drop on Request (DOR)” for designated “Volunteer High Risk Courses”
  - Describes the “Pre-Mishap Plan” and specifies its location(s) in the training environment

Security/Safety/Hazard Awareness Notices must be written to reflect the individual course. Security/Safety/Hazard requirements must be incorporated throughout the course, wherever they must be restated.

4.9 Table of Contents

- In Volume I provide a complete listing of the contents of all volumes in the TG
- In following volumes, only the Instruction Sheets contained in that volume are listed

4.10 How to Use Your Trainee Guide

- This provides a general description of the composition, function and

use of Instruction Sheets and the Trainee Guide

- Describes the Instruction Sheet Types
- Discusses the use of the Instruction Sheets
- Describes what the trainee may expect on examinations and quizzes administered in the course
- Discusses organization of the course

4.11 Course Learning Objectives (CLOs)

- The CLOs are taken directly from the *Curriculum Outline of Instruction* **(COI)** and must match exactly the CLOs in the COI as to content and sequence

4.12 Course Schedule (Optional)

- This is taken directly from the *Training Course Control Document* **(TCCD)**

SECTION 5.0 INSTRUCTION SHEETS IN A TRAINEE GUIDE

General requirements

- Instruction Sheets are organized by Parts, Sections and Topics:
  - Parts, Sections, and Topics are numbered according to the TCCD Outline of Instruction
  - Parts, Sections, and Topics are listed in the Table of Contents in the Front Matter for organizational purposes but there are no Part, Section, or Topic Pages within the body of the Trainee Guide
  - Instruction Sheets are arranged according to the sequence in which they are used within the Topic
- Instruction Sheets are titled so as to describe the subject matter of the sheet
- The Introduction describes the overall scope and content of the particular Instruction Sheet
- When listed on an Instruction Sheet, the *Topic Learning Objectives* **(TLOs)** are copied directly from the TCCD. TLOs need not be listed on more than one Instruction Sheet
- Applicable documentation is identified by paragraph, page, figure, or diagram numbers, and complete title

See Volume II, Tab A-6 for samples of the Instruction Sheets discussed on the following pages.

SECTION 6.0 PREPARE JOB SHEETS

6.1 Job Sheets:

- Direct the trainees in the step-by-step performance of a skill that may be encountered in their eventual job assignment
- Provide a means for the trainee to apply knowledge acquired during instruction
- Do not contain any directions to the instructor
- Require the trainees to use the technical documentation in performing the skill, just as they would at their ultimate duty station

6.2 Identify What Skills Must Be Trained

- **First**, identify the task/skill, the trainee will perform using the TLA and PPP table — for example:
  - Perform normal operations on the CUCV
  - Perform preventive maintenance on the CUCV
  - Classify sonar contacts
- **Second**, analyze the skill from the PPP table line items to identify the procedural steps.
  - See Chapter 3, *Personnel Performance Profiles* **(PPPs)**, for an example of a list of tasks supporting a job
- Third, select those tasks you are able to train in your course—These become the basis of your Job Sheets

6.3 Job Sheet content

- Use the “Introduction” to describe the purpose of the Job Sheet and the trainee benefits that can be expected
- Under “Equipment” provide a complete listing of all equipment required to perform the Job Sheet
- “References” list all publications required to perform the Job Sheet
- “Job Steps” list the procedures for performance of operation, maintenance, troubleshooting, repair of the equipment, or performance of a task/function
  - They do not duplicate the procedures listed in the technical documentation
  - Job Steps may consist of either general or discrete step-by-step procedures for performing tasks associated with a the job
  - Sufficient space should be left under each Job Step to record information
- “Self-Test Questions” provides questions which:
  - Are easily understood, grammatically correct, and easily graded by the instructor
  - Are technically correct and have direct application to the skill being performed
  - Require analysis and thought similar to that required in the actual job situation

SECTION 7.0 PREPARE INFORMATION SHEETS

7.1 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 trainees' comprehension of technical manual materials

7.2 Information Sheet content

- Use the “Introduction” to explain to the trainee “how and why” an understanding of the material will be of benefit
- “References” list all publications used to develop the information section of the Information Sheet
- “Information” should not duplicate information contained in the technical documentation
  - The Information must be written clearly and to a level consistent with the trainee's reading ability
  - The Information will refer to technical manuals or other approved publications, citing specific paragraphs, figures, tables, etc.
- Types of information include:
  - Information on new concepts
  - Background information
  - Clarifying information

SECTION 8.0 PREPARE ASSIGNMENT SHEETS

8.1 Assignment Sheets:

- Simplify the trainees' search for relevant data
- Prepare trainees for future job specific skills that require researching and locating data in the technical documentation used for operation and maintenance purposes
- Maximize effectiveness of the trainees' study by providing clear statements of the TLOs and study questions

8.2 Assignment Sheet content

- “Topic Learning Objectives” list the applicable objectives covered by the assignment and read identically with those listed in the TCCD
- “Study Assignment” lists material to be studied before, after or as part of the Topic
- Specific study instructions, including preferred sequence of study may be included
- “Study Questions” should provide questions which assess the trainees' understanding of what was studied or test their ability to apply the information

SECTION 9.0 PREPARE PROBLEM SHEETS

9.1 Problem Sheets:

- Present practical problems requiring analysis and decision-making similar to what the trainee may encounter either in the laboratory or at their eventual duty station
- Engage the trainee in problem solving, emphasizing the fundamentals of logical thinking, and giving practice in the application of knowledge to practical situations
- Are used when the subject matter of a course requires an ability to solve problems in a logical manner

9.2 Problem Sheet content

- "Problems" presents problems which:
  - Are organized in any reasonable manner that promotes problem-solving abilities
  - Provide a clear statement of the problem(s), and the conditions and parameters affecting the problem(s)
- "Directions" provides instructions and procedures for the solution to the problem
- Drawings/diagrams may be used as necessary
- Problem Sheets will not be used for testing, as a make-work device, or as a substitute for a laboratory activity

SECTION 10.0 PREPARE DIAGRAM SHEETS

10.1 Diagram Sheets:

- Provide the trainee with copies of special course material such as diagrams, schematics, or illustrations

10.2 Diagram Sheet content

- They may depict a sketch the instructor will also draw on the board, *Instructional Media Material* **(IMM)**, or any diagram or schematic deemed important for trainee use
  - "Diagrams" should be large enough so trainees have room to make pertinent notations
- Diagram Sheets are not to be provided where materials exist in reference documentation and the use of that documentation will suffice

SECTION 11.0 PREPARE OUTLINE SHEETS

11.1 Outline Sheets:

- Provide the trainee with an outline of the major teaching points in the Topic
- Are consistent with the outline of the *Discussion Points* **(DPs)** contained on the Topic's *Discussion-Demonstration-Activity* **(DDA)** pages
- Allow the trainee to follow the progress of a Topic, and facilitate the note-taking process, if intended for this purpose
- An outline sheet may be used to list TLOs contained in the course

11.2 Outline Sheet content

- "Outline" presents an outline of the major points to be covered in the Topic
  - Use only key words or phrases
  - More subheads may be included than on the DDA pages of the Topic, if necessary
- Usually, space is not provided for note taking, unless the sheet is being designed primarily for this purpose

SECTION 12.0 INSTRUCTION SHEETS NOT IN A TRAINEE GUIDE

These Instruction Sheets

- Are distributed separately
- Do not have Front Matter
- Security information or safety/hazard awareness information may be provided on an Information Sheet
- Are listed under “Trainee Preparation” in the Topic
- Have the same content and form as those contained in a Trainee Guide except the following is omitted from the running header:
  - Volume identification
  - The phrase “Trainee Guide”
- A Trainee Guide is required whenever the number of Instruction Sheet pages exceeds 12 pages
- The words “For Training Use Only” must be on the bottom of every printed page.

SECTION 13.0 TRAINEE GUIDE GENERAL SPECIFICATIONS

- When necessary, may be organized into one or more volumes — at approximately 200-page intervals
- Subsequent volumes will repeat only those Front Matter elements which are necessary for understanding and using the particular volume
- May be printed on one side of the page or back-to-back
- The phrase “This page intentionally left blank” or similar phrases will not be required on blank pages unless all pages must be accounted for because of the classified nature of the Trainee Guide material
- Number Front Matter pages
  - Consecutively using lower case Roman numerals
  - Number is placed in the lower right-hand corner of each page
  - No number is placed on the Trainee Name Page or the Cover
  - A number is not placed on the Title Page, although it is counted in the numbering of the Front Matter as page one
- Sequential numbering of Training Guide pages other than the Front Matter is at the discretion of the CCA/CCMM
- The words “For Training Use Only” must be on the bottom of every printed page
- The Instruction Sheet number is a four-element number
  - First element – Part number
  - Second element – Section number

- Third element – Lesson Topic number
- Fourth element – sequence number within the Lesson Topic

SECTION 14.0 PRINTING

14.1 Single-sided or double-sided page printing may be used

- Courses likely to incur frequent page changes because of changing technical documentation should probably be printed single-sided
- Courses expected to incur infrequent page changes, because of relatively static technical documentation, are good candidates for double-sided printing
- Factors such as ease of use from the podium, expected total number of pages, command preference, and so forth, may also apply

SECTION 15.0 WHAT IS NEXT?

- You will develop the test plan and tests, both performance and knowledge. Actually, you should have already begun developing the performance tests when you began with Job Sheet identification and development

- Hopefully, as you were developing the Lesson Plan and Trainee Guide you were also thinking of the tests (both performance and knowledge) that would be required to support a given topic, and making notes to yourself of any especially good ideas with regard to the tests to be constructed

- Obviously, this last point means that development of the Lesson Plan, Trainee Guide, and Tests proceeds more or less simultaneously. A "good idea" that you have regarding a Topic, or test, may occur while you are writing an Instruction Sheet for the Trainee Guide. You should either act on the idea at that time and incorporate it into the appropriate document, or at the very least jot the idea down for action at a later date

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.

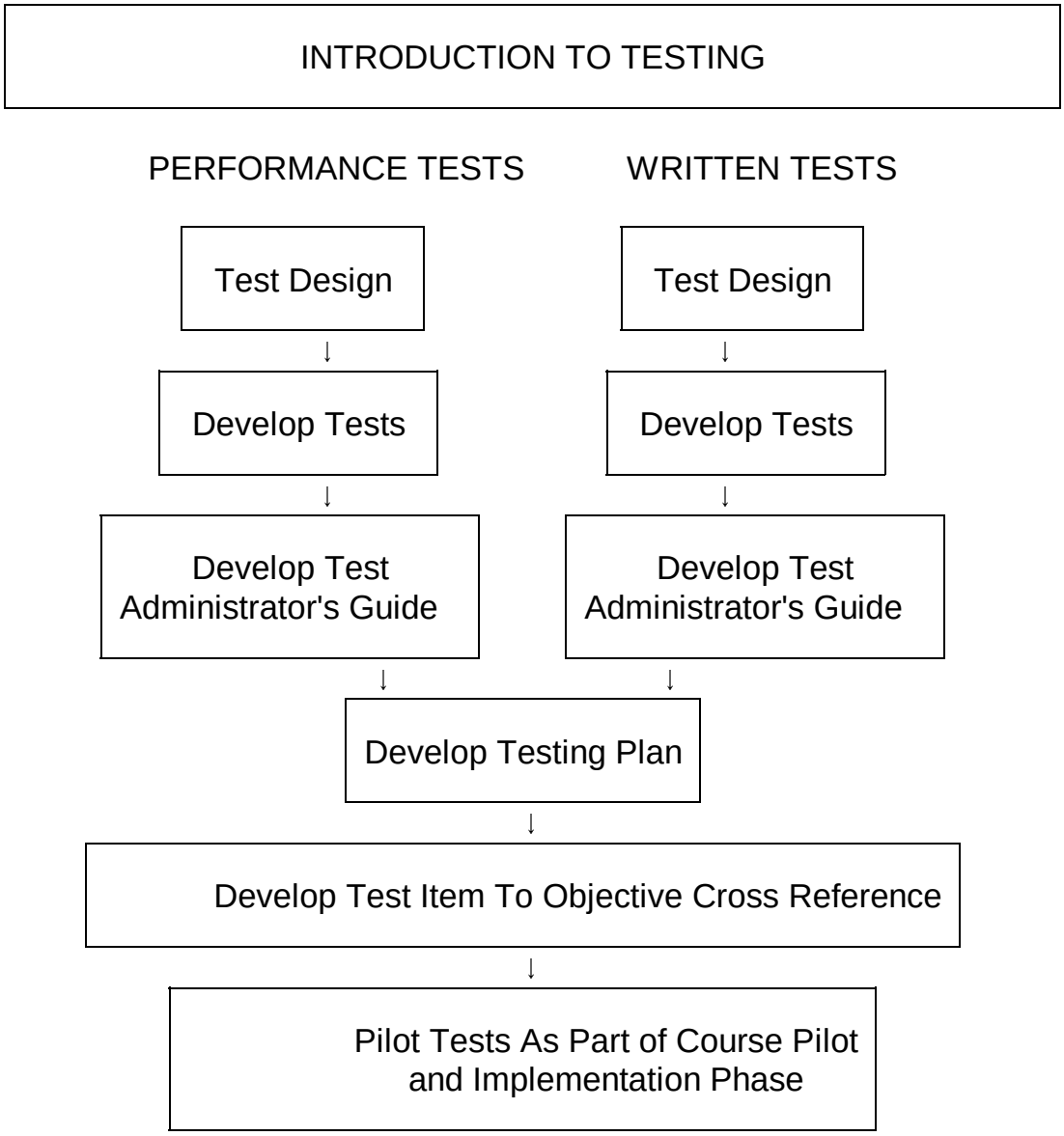
Tests must be developed when a grade (either within-course or end-of-course) is to be assigned, or a trainee's course PASSING/FAILURE must be decided and recorded. This chapter will provide you with guidelines for designing and developing Performance and Written Tests, based on the development and use of job sheets, test items and tests.

Organization of this chapter. In most cases the information provided in this chapter will suffice for the design, development and scoring (grading) of performance and written 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, Trainee Guide* 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.**

CHAPTER'S SCOPE

- To provide information on Test Development and Administration for those involved in developing PPP—Based curricula
- The diagram below lays out the Testing process in the order that events should occur:


INTRODUCTION TO TESTING
PERFORMANCE TESTS
WRITTEN TESTS
Test Design
Develop Tests
Develop Test Administrator's Guide
Test Design
Develop Tests
Develop Test Administrator's Guide
Develop Testing Plan
Develop Test Item To Objective Cross Reference
Pilot Tests As Part of Course Pilot and Implementation Phase

CHAPTER OUTLINE

TITLE	PAGE NUMBER
INTRODUCTION TO TESTING	8-1-1
Definitions	8-1-1
Required Events...Are	8-1-1
DESIGN PERFORMANCE TESTS	8-2-1
DECIDE WHICH PERFORMANCE TLOS TO TEST	8-3-1
Criticality of Skill	8-3-1
Other Criticality Factors	8-3-1
Rank order...TLOs	8-3-1
Performance Objective test guidelines	8-3-2
DEVELOP PERFORMANCE TESTS	8-4-1
Develop Job Sheets	8-5-1
Performance Test Types	8-5-1
Deciding Which Performance Test Type to Use	8-5-4
Develop job sheet evaluation instruments	8-6-1
Sample Performance Test Checklist (Figure 8-1)	8-6-5
Sample Performance Test Rating Scale (Figure 8-2)	8-6-6
Sample Grading Criteria for A Checklist (Figure 8-3)	8-6-7
Sample Grading Criteria for A Rating Scale (Figure 8-4)	8-6-8
DEVELOP PERFORMANCE TEST ADMINISTRATOR'S GUIDE	8-7-1
Sample Administrators Guide Instructions to the Trainee (Figure 8-5)	8-7-2
Sample Instructions for the Administrator (Figure 8-6)	8-7-4

CHAPTER OUTLINE (CONTINUED)

TITLE	PAGE NUMBER
DESIGN WRITTEN TESTS	8-8-1
DECIDE WHICH KNOWLEDGE TLOS TO TEST	8-8-2
Level of Learning Determination	8-8-2
Ways that knowledge is used on-the-job	8-8-2
Imperatives regarding levels of learning selection	8-8-3
Description of the levels of learning	8-8-3
Criticality of Knowledge	8-8-4
Other Criticality Factors	8-8-5
Rank order...TLOs	8-8-5
Knowledge Objective Test Guidelines	8-8-6
DEVELOP WRITTEN TESTS	8-9-1
Written Test components	8-9-1
Written Test types	8-9-1
Construction of Each Test Type	8-9-1
Multiple Choice	8-9-1
True-False	8-9-2
Matching	8-9-2
Completion	8-9-2
Essay	8-9-3
DEVELOP WRITTEN TEST ADMINISTRATOR'S GUIDE	8-10-1
Sample Instructions for the Administrator (Figure 8-7)	8-10-2
Sample Written Test Instructions to the Trainee (Figure 8-8)	8-10-3
DEVELOP TEST PLAN	8-11-1
Test Plan Elements	8-11-1
General Guidelines for Developing	8-11-1
DEVELOP TEST TO OBJECTIVE COMPARISON	8-12-1
PUTTING IT ALL TOGETHER	8-13-1
Assemble Job Sheets	8-14-1
Assemble Performance Test Administrator's Guide	8-15-1

TITLE PAGE NUMBER

Assemble Written Test Booklet 8-16-1
Assemble Written Test Administrator's Guide 8-17-1
Assemble Test Design 8-18-1
Assemble Test Plan 8-19-1
Assemble Test to Objective Comparison 8-19-1

CHAPTER OUTLINE-ADDENDA

TITLE PAGE NUMBER

ADDENDUM 8: IN–DEPTH DISCUSSIONS OF

8-A: PERFORMANCE/WRITTEN TEST DESIGN 8-A-1

8-B: WRITTEN TEST ITEM DEVELOPMENT 8-B-1

8-C: GRADING CRITERIA FOR PERFORMANCE TESTS 8-C-1

SECTION 1.0 INTRODUCTION TO TESTING

1.1 Definitions

- Tests are the primary tool for determining trainees' attainment of the CLOs/TLOs and, therefore, their relative success in the course
- Performance tests measure a trainee's ability to perform a specific skill or behavior by using actual equipment or training devices
- Written tests are used to support the performance of a skill by measuring the trainee's achievement of theory and/or background knowledge as it applies to a skill or behavior
- Measurement is the process of assessing what the trainee has demonstrated by taking the Performance/Written test
- Evaluation is the process of comparing the measurement against an established standard
- Grading is labeling (scoring) the evaluation, usually according to a level of success, e. g. , go/no—go

1.2 Required events for test development are

- Design the Tests
  - Here decisions as to the What, When and How testing will be determined
- Develop the Performance Tests
  - Job Sheets will be developed and used as the basis for testing those critical tasks the trainee has been trained to perform

- Develop the Written Tests
  - Decisions will be made as to where and what Written tests are required to support the performance testing program
- Develop Administrator's Guide/Trainee Testing Information
  - Essential information will be developed for facilitating the administration of both Performance and Written Tests
- Develop Test Plan and Test to Objective Comparison

SECTION 2.0 DESIGN PERFORMANCE TESTS

- During Performance Test Design you will decide what skills to test for 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

  - This process will help you 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-B for guidance in deciding whether to test using the actual equipment or simulation

SECTION 3.0 DECIDE WHICH PERFORMANCE TLOs TO TEST

3.1 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

3.2 Other Criticality Factors

> *Criticality* refers to a TLO's 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

3.3 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 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 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% are most critical. They require formal testing. TLOs ranked in the lower 33% are less critical. Formal testing is not required.

3.4 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

  - 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

  - 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

3.5 When you have completed this process

- You will have one set of Performance TLOs from which to build the tests

SECTION 4.0 DEVELOP PERFORMANCE TESTS

Performance Test components are

- Job Sheets
- Job Sheet Evaluation Instruments
- Performance Test Administrator's Guide

SECTION 5.0 DEVELOP JOB SHEETS

- For specific guidance on developing job sheets see Chapter 7, Trainee Guide, of this volume
- Job Sheet problems must be consistent with but not identical to those used during the course nor can they introduce unfamiliar information
- All Job Sheets must require the trainees to use the technical documentation just as they will upon reaching their ultimate job assignments
  - 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 may, therefore, be used in place of a written test for the information
- Each Job Sheet will support one of these test types: A product, a process, or product and process combined

5.1 Performance Test types are

- Product
- Process
- Combination (Product and Process)

5.2 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, for example, 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:
  - 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
  - The 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

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 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)

5.3 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

- When both a process and its product can be measured, select the one that is easiest to measure, using the following as 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/Written Test Design*, at the end of this chapter, for more information on this topic

SECTION 6.0 DEVELOP JOB SHEET EVALUATION INSTRUMENTS

6.1 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 8-1* and *Figure 8-2*, 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.

6.2 Guidelines For Developing

- Develop one checklist and/or rating scale, and grading criteria, for each task or group of tasks 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

- For 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 written test-items in a performance test indicate the correct response and how many points will be deducted for an incorrect response
  - When written 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 135A, Appendix B.

6.3 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

6.4 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

6.5 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, Social Security Number, class, beginning and ending time, score, etc.

PERFORMANCE TEST
JOB SHEET 5-1-5 CHECKLIST

TITLE: Measuring a Crankshaft Journal

TRAINEE NAME/RATE_____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 8-1: SAMPLE PERFORMANCE TEST CHECKLIST

PERFORMANCE TEST
JOB SHEET 10-3-2 RATING SCALE

TITLE: Construct a Box Sill Floor Frame

TRAINEE NAME/RATE_____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".	0, -5, -10
2.	Installed sill plates within 1/8" 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".	0, -5, -10
4.	Measured, marked, and squarely cut each joist to specified length, within 1/8".	0, -5, -10
5.	Aligned header and floor joists (Crown up) within 1/8" of specified locations and height.	0, -5, -10
6.	Snapped chalkline across floor joists on centerline of building, within 1/8".	0, -5, -10
7.	Placed and secured bridging staggered 1 1/2" off center, within 1/8".	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" 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 8-2: SAMPLE PERFORMANCE TEST RATING SCALE

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 (10) 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 GRADING CRITERIA FOR A CHECKLIST

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 which 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" of specification = -0 points.

Any product dimension 3/16" out of specification = -5 points.

Any product dimension more than 3/16" 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 8-4: SAMPLE GRADING CRITERIA FOR A RATING SCALE

SECTION 7.0 DEVELOP PERFORMANCE TEST ADMINISTRATOR'S GUIDE

7.1 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 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 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

A. Present the following to the trainee:

1. 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.

2. All test equipment, tools, and materials are available to you. You must determine what is needed for each task.

3. You may be required to leave the area after each task if additional preparation is required for the next task.

4. 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.

5. You will not be assisted with your performance. The administrator may intervene after a task begins in order to correct a critical procedural error.

6. The requirements may be restated or explained at your request. Do your best. If you cannot perform the task, inform the administrator.

7. 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.

B. Ensure that the trainee understands all of the above items before proceeding to the first problem.

FIGURE 8-5 SAMPLE ADMINISTRATOR'S GUIDE INSTRUCTIONS TO THE TRAINEE

7.2 Develop Instructions to the Administrator, including

See Figure 8-6 for an example

- 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 written test-items (written and/or oral)
- Guidance on the actions to be taken in the event that the trainee does not perform as anticipated
  - For example, if a critical step is improperly performed remediation and retesting are in order

INSTRUCTIONS TO THE ADMINISTRATOR

A. The trainee will be performing the _____ task(s). The following tools and test equipment are required:

1.
2.
3.
4.

B. Preset the following controls on the _____.

1.
2.
3.
4.
5. Remove part no._____from the_____ and replace with faulted part.

C. State the following special procedures to the trainee:

1. Briefly describe the task and its relationship to the objective.

2. State any special safety precautions/procedures that may be applicable.

3. 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 8-6: SAMPLE INSTRUCTIONS FOR THE ADMINISTRATOR

This concludes the *refresher* discussion on Performance Test Design/Development. Remember, if you need more information see Addendum 8A on Performance Test Design/Development.

SECTION 8.0 DESIGN WRITTEN TESTS

- During Written 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

8.1 Written 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

8.2 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

> Any of the Levels of Learning listed above may apply to any of the knowledge Training Objective Statements described in the Training Path System Chapter, depending upon the individual circumstances

8.3 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

8.4 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 a maintenance procedure
- **K3 – Comprehend**. Comprehension is understanding 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 judgement 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

8.5 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

8.6 Other Criticality Factors Knowledge Applies To

> *Criticality* refers to a TLO's 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

8.7 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 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 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% are most critical. They require formal testing. TLOs ranked in the lower 33% are less critical. Formal testing is not required.

8.8 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 Written Test
  - Knowledge objectives judged to rank in the middle-to-lower one-third as to criticality may be tested by having trainees answer questions on Job Sheets or other instruction sheets, such as Assignment Sheets
  - 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

8.9 When you have completed this process

- You will have one set of Knowledge TLOs from which to build the tests

  NOTE: See Addendum 8-A for an in-depth discussion of performance and written test design

SECTION 9.0 DEVELOP WRITTEN TESTS

9.1 Written Test components are

- Written Test Booklets
- Written Test Administrator's Guide

9.2 Written Test types are

- Multiple Choice Test
- True-False Test
- Matching Test
- Completion Test (e.g. labeling, short answer)
- Essay Test

9.3 Construction of each test type

- 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

  - Consist of a direct statement and either a true/false or a yes/no alternative

- Matching

  - Contains *directions* to inform the trainee how to match the items listed below

  - Normally has two columns listed below the directions with the questions/stimuli placed in the left-hand column and, answers/responses being 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, and so forth

  - 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 on written test item development

SECTION 10.0 DEVELOP WRITTEN TEST ADMINISTRATOR'S GUIDE

10.1 Develop Test Booklet Module

- The Test Booklet module 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

10.2 Develop Instructions to the Administrator

See Figure 8-7 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 8-7: SAMPLE INSTRUCTIONS FOR THE ADMINISTRATOR

10.3 Develop Test Instructions to the Trainee, including

See Figure 8-8 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, 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 instructions 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 8-8: SAMPLE WRITTEN TEST INSTRUCTIONS TO THE TRAINEE

This concludes the *refresher* discussion on Written Test Design/Development. Remember, if you need more information see the associated Addenda on Performance Test Design/Development.

SECTION 11.0 DEVELOP TESTING PLAN

- The Testing Plan documents the test procedures for the course

11.1 Testing Plan components are

- Cover Page
- Discussion of Tests and Methods
- Testing Constraints (if applicable)
- Performance Tests Numerical Grade (if applicable)
- Minimum Passing Grade
- Procedures for Computing Final Grade
- Discussion of Remediation Strategy/Materials
- Test Schedule

> *NAVEDTRA 135A* provides more detail on Test Plans.

11.2 General Guidelines for Developing Testing Plans

- Tests and Methods
  - Describe the types of tests, including any other methods for determining trainee achievement of the objectives
- Testing Constraints

- Describe any situation that prevents testing of the objectives and explain what actions have been taken to eliminate the constraints

- Performance Test Numerical Grade
  - Describe how a Performance Test numerical grade will be determined
- Minimum Passing Grade
  - State this grade and rationale for establishing
- *Final Grade*
  - State the grading and weighting criteria for this grade Remediation
  - Describe review, remediation and retesting procedures
- Test-to-Objective-to-PPP Line Item Comparison
  - See Volume II, Tab A-4 (OAC), for an example and the columnar headings comprising this document
  - The Profile Item-to-Topic Objective Assignment Chart may be used for this purpose by adding appropriate columns
- *Test Application*
  - Refers to the type of test, for example, pretest, progress test, comprehensive test, etc.
- Test Schedule
  - Indicate those periods for which a test is scheduled, and the identifying number of the test

SECTION 12.0 DEVELOP TEST TO OBJECTIVE COMPARISON

- No particular format is prescribed for this document — But the easiest way to satisfy this requirement is to add a Test Item Number column to the Profile Item-to-Topic Objective Assignment Chart

- The primary consideration is that each job sheet/knowledge test item must be trackable to the objective it supports

You have now completed the entire *Refresher* discussion on designing and developing Performance and Written Tests. If needed, additional information on these topics may be found in the related *ADDENDA* located several pages farther on.

SECTION 13.0 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 Information
  - Written Test Booklet
  - Written Test Administrator's Information
  - Performance/Written Test Design
  - Testing Plan
  - Test to Objective Comparison
- Having done this, it is now time for you to take each grouping or category of documents/individual pages and assemble them into a single cohesive document, complete with Cover Page
  - Format considerations will be discussed only where necessary, and because just looking at the provided example may leave you guessing about format

> As you assemble each document, **look at the related example in Volume II** for required headings/ information and overall document format

SECTION 14.0 ASSEMBLE JOB SHEETS

As per Chapter 7 and the Volume II example, plus

- Security classification if applicable—must appear on the page
- All written test questions must meet the requirements for writing written test questions

SECTION 15.0 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.

15.1 Cover Page

- As per the Volume II example, plus
  - Security classification if applicable—must appear on the page

15.2 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 written 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

15.3 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)

15.4 Grading Criteria

- Provide a scoring guide that describes how each step or group of steps is to be graded

15.5 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

15.6 Performance Record Sheet

- Used for administrative information, e. g. , 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 135A

SECTION 16.0 ASSEMBLE WRITTEN TEST BOOKLET

- The Booklet includes
  - Cover Page
  - Test Questions
  - Answer Sheets
  - All pages are numbered consecutively, following the Cover

16.1 Cover Page

- As per the Volume II example, plus
  - Security classification if applicable—must appear on the page

16.2 Test Questions

- All test questions should be numbered

16.3 Answer Sheet

- Not required if the trainees are to enter their answers in the Test Booklet
- Required if the Test Booklets are reusable

SECTION 17.0 ASSEMBLE WRITTEN 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 written 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.

17.1 Cover Page

- As per the Volume II example, plus
  - Security classification if applicable—must appear on the page

17.2 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

17.3 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

17.4 Grading Criteria

- This consists of a scoring guide to describe how each question/group of questions is graded

17.5 Instructions To The Trainee

- This includes
  - 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 18.0 ASSEMBLE TEST DESIGN PLAN

- Preparation and assembly of this document is optional, 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 wish to compile these documents as the Test Design Plan

SECTION 19.0 ASSEMBLE TESTING PLAN

19.1 Cover

- As per the Volume II example, plus
  - Security classification if applicable—must appear on the page

19.2 Assemble Test To Objective Comparison

- Whatever form this document takes it will probably consist of a series of separate pages which must be assembled in order, and perhaps given a cover

For additional guidance see the following ADDENDA

ADDENDA 8: IN-DEPTH DISCUSSIONS OF

8-A: PERFORMANCE/WRITTEN TEST DESIGN

8-B: WRITTEN TEST ITEM DEVELOPMENT

8-C: GRADING CRITERIA FOR PERFORMANCE TESTS

ADDENDUM 8-A

IN-DEPTH DISCUSSION

OF

PERFORMANCE/WRITTEN 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 (Types of)

PERFORMANCE TESTS	WRITTEN TESTS
Process	Multiple Choice
Product	True-False
Combination	Matching
	Completion
	Essay

Terms Associated with Placement of Tests in the Course

PERFORMANCE TESTS/WRITTEN TESTS

Pretest

Progress Test

Quiz

Within-Course Comprehensive Test

Comprehensive Test (Posttest)

SECTION 1.0 TEST DESIGN

Test Design is the process of determining

- What will be tested
- How it will be tested, and
- When it will be tested

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/Written Test items

This is also the outline for this Addendum

SECTION 2.0 DETERMINE OBJECTIVES REQUIRING FORMAL TESTING

2.1 The following rules apply

- All LOs must be measured
- All CLOs will be formally tested—to be accomplished by:
  - Testing each CLO individually and none of its related TLOs
  - Testing the TLOs which, as a group, equal the CLO
  - Testing a CLO, or some part thereof, and some of its TLOs
  - Any combination of the above during the course
- 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 3.0 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 a task/function is to be taught

- Many of the tests will probably be of the Product Type — This is because many task/functions result in the making of a product. Yeoman and Personnel man 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 in the task/function environment. 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 4.0 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 CLOs and TLOs 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, and so forth

In extreme situations, a written 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 Written 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
- While attempting always to use a form of Written 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 5.0 DETERMINE APPROPRIATE TEST TYPE

Recall that the test types are

PERFORMANCE — Process — Product — Combination

KNOWLEDGE — Multiple Choice — True False — Matching — Completion — Essay

The following factors are important to deciding test type

- Behavior/Condition specified in the objective
- Availability of equipment/training devices
- Space availability
- Number of trainees
- Time required to administer the test
- Use/Adequacy of technical documentation
- Aided or unaided performance
- Individual, team or group performance
- Philosophical considerations

This is also the order of their discussion

SECTION 6.0 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

	Types of Test Items					
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 to administer the test

- Performance Tests must 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 will fall within a range of 51–100%, also expressed as ranging from required—ideal

- Time required to set-up the test situation, time allocated for taking the test, and reviewing and grading it, 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 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 proviso regarding safety:

  - *When trainee injury or equipment damage is a possibility then prior to the test, a written 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 preform 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 written 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 written 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 he will assume at their next duty station
  - For grading purposes, either end-of-course, 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 7.0 DETERMINE TEST PLACEMENT

- During Course Master Schedule 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 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

The Questions

- 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 8.0 CLASSIFY EACH TEST

This really 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 135A
  - 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
  - The Pretest grade may be included as part of the trainee's final grade
- Progress Test — Given at different points within the course to assess trainee progress
  - Frequently administered at the completion of a Part, Section, group of Lesson Topics, or a particularly lengthy Lesson Topic
- Quiz — a short test, often devised by the instructor and used to assess mastery of recently taught material
  - These tests, as a rule, are unscheduled and not part of the formal test program
- Comprehensive Test — Given at the end of the course
  - Used to measure mastery of the TLOs and CLOs, particularly the critical performance TLOs/CLOs
- Within-Course Comprehensive Test — Used during lengthy courses for reinforcement, and as a means of helping the trainees to retain what they have previously learned

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 Written Testing, where to locate each test within the course, and the purpose of each test (pretest, progress, posttest, 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 Part or Section, but may cover a single Lesson Topic, especially if the topic is a lengthy one
- Time allowed for the administration of 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 it is tested — As a rule, the minimum time provided should be at least one overnight period set aside for preparation

SECTION 10.0 DEVELOP PERFORMANCE TESTS/ WRITTEN TEST ITEMS

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
  - To build/make an item, the dimensions of which will be measured against a standard/tolerance
  - To build/make an item to perform a certain function
  - To assemble/connect equipment to perform a certain function
  - To 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 Written Tests are developed next

- Written Tests—Measure the trainee's knowledge or comprehension of certain facts or procedural steps:
  - Trainee answers may be orally or in writing
  - The test types include: multiple-choice, true-false, matching, completion and essay items
  - Written test items, written to test a particular Part, Section or Topic are assembled into a Test Item Bank

10.3 Determine number of written 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 most critical and least critical objectives are measured on the same test the most 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

Guidelines for developing written test items are discussed in Addendum 8-B, which begins on the next page

ADDENDUM 8-B

IN-DEPTH DISCUSSION

OF

WRITTEN TEST ITEM DEVELOPMENT

SECTION 1.0 WRITTEN TESTS

Written 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

The following steps are required to develop written tests

- Determine level of learning required to test the objective
- Refer to the number of test items required per objective, developed previously
- Develop written test items
  - Multiple Choice
  - True-False
  - Matching
  - Completion
  - Essay
- Oral versus written testing
- Ensure appropriateness of test items

This is also an outline of this Addendum

SECTION 2.0 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 written 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 written test item types, and a brief description as to the best use for each type of test item
- Types of written test items are
  - Multiple Choice
  - True False
  - Matching
  - Completion
  - Essay
- Each type will be discussed in the order listed above

SECTION 3.0 DEVELOP MULTIPLE CHOICE KNOWLEDGE TEST ITEMS

3.1 The multiple choice test item is

- 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 making the trainee to read 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 by a figure number at the *beginning* of the stem

- Test items in the form of questions must be complete sentences ending with a question mark

- The completion position of an incomplete statement test item must be near or at the end of the stem

- There should be only one completion position in a stem

- Stems prepared in question form 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 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

- 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 so that decimal points are aligned

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's position 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

During system verification test what supplies voltages for TVC position sensor tracking?

(a) Minus 2Ø VDC precision power supply
(b) Self-test DC reference power supply
(c) TVC position sensor AC/DC converter
(d) Missile command module

- This format is straightforward and easiest to develop

3.11 Example of Except Format

A specific torquing 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, 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 MARDAN

(c) Functions as a running time meter
(d) Provides static testing of MARDAN

- 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) Power from the ship control center may be present in MCC since it only goes through the SHIP JP.

- 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. This causes confusion for the trainee

- Example — error underlined (note that alternative 2 includes alternative 1. Therefore, if alternative 2 is correct, then so is alternative 1):

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

This concludes the discussion

- Of how to develop Multiple Choice Test Items

- Next, we will discuss how-to develop True-False Test Items

SECTION 4.0 DEVELOP TRUE-FALSE WRITTEN 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 — Trainees have a 50% chance of responding correctly even though they don't 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
- Example:

(TRUE/FALSE) 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

This concludes the discussion

- On developing true-false test items
- Next we will discuss developing matching test items

SECTION 5.0 DEVELOP MATCHING WRITTEN 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 a set of directions and two columns listed below the directions:
- 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
- Example:

(DIRECTIONS) 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. Bl∅
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. C3∅
	g. D56

5.3 Construction of Matching Test Items

- The 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

Completion test item development begins on the next page

SECTION 6.0 DEVELOP COMPLETION WRITTEN 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 eliminated
- 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

- The 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

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 written tests

SECTION 7.0 DEVELOP ESSAY WRITTEN TEST ITEMS

7.1 Essay type test items

- Require the trainee to answer a question with an original, written response
- Are useful for testing ones' 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 Format 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

- The grading criteria should list all essential data a knowledgeable trainee can be expected to provide
- The model answer/grading criteria are used as the standard answer by which all other answers are scored
- They set the weight (value) of each item or part of an item

When to use oral tests and written tests follows

SECTION 8.0 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

- 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 choice or matching test items

Next you will learn

- How to determine if all of the many written test items you have written meet standards for correctness

SECTION 9.0 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 a 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 — 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
- As each written test item meets all criteria above it is approved for use in a written test

This finishes the discussion of this Addendum —

- Go next 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 1.0 GRADING CRITERIA—PURPOSE

- Grading criteria describe the standards by which the trainees will be measured and factors that will be considered in determining the trainees' grade on an individual performance or written 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 trainees' 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
- Time required to complete the job
- Skill in using tools
- Care and use of the equipment
- Whenever any of the above factors apply, the grading criteria must describe what the trainee is expected to do and what happens if the requirements are not met

SECTION 2.0 TESTING PLAN

2.1 Cover Page

- The Cover will contain:
  - Course Title
  - Course Identification Number (CIN)
  - The phrase Test Plan
  - Security classification (if applicable)
  - Date the Testing Plan was prepared

2.2 Tests And Methods

- Under the heading “Tests and Methods” describe the types of tests and methods used to determine trainee grades

2.3 Testing Constraints

- Under the heading “Testing Constraints” describe any situation that prevents the testing of the objectives as stated and explain what actions have been taken to eliminate the constraints

SECTION 3.0 PERFORMANCE TEST NUMERICAL GRADE

- Under the heading “Performance Test Numerical Grade” describe the method used to assign numerical grade to Performance Tests

3.1 Minimum Passing Grade

- Under the heading “Minimum Passing Grade” describe the minimum passing grade and rationale for establishing the grade

3.2 Final Grade

- Under the heading “Final Grade” describe the grading and weighing criteria for the final grade

3.3 Remediation

- Under the heading “Remediation” describe review, remediation and retesting procedures

3.4 Test-to-objective Comparison

- Under the heading “Test-to-Objective Comparison” provide
  - Under the heading “Unit,” list the Unit number
  - Under the heading “Lesson Topic,” list the Lesson Topic number
  - Under the heading “Objective,” list the terminal/enabling objective number
  - Under the heading “Test Number,” list the test number of each performance and written test

- Under the heading “Version,” list the number of versions of the test available
- Under the heading “Application,” indicate the test application

3.5 Test Schedule

- Under the heading “Test Schedule” list
  - Under the heading “Period,” indicate the periods during which a test is to be administered
  - Under the heading “Test Number,” indicate the test to be administered at that time

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 were Lesson Plans, Trainee Guides, and Test Packages. You are now ready to begin work on the **Visual Information (VI)** that supports the Lesson Plans and Trainee Guides that you have already developed.

Additionally, information will be provided for developing an Exercise Controller Guide and On-The-Job Training Handbook, each forms of 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 to determine the most appropriate VI and ends with the course promulgation. In this chapter step-by-step procedures for the analysis of objectives and selection of the most appropriate VI based on 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 CNET instructions. VI products must be developed in accordance with the latest regulations. Your command's Video Information Manager will assist you in gathering information and completing required forms.

OPNAVINST 5290.1A, encl. (1), para. 3-1-f defines the VI products exempt from production reporting requirements. Exemptions include graphics and overhead transparencies.

> The Foreword and How to Read NAVEDTRA 131A contain guidelines for reading this manual – you should read them now if you have not already done so.

CHAPTER'S SCOPE

- Define types and applications of VI and IMM
- Determine the need for VI and IMM
- Determine the type(s) of VI and IMM which best support training
- Explain the VI and IMM development process

Each VI is unique in terms of application to the classroom/ laboratory. Because of time and other resource constraints/ limitations imposed on in-house development of training materials, only VI that are relatively easy to develop are presented here.

DEFINITIONS:

- **Visual Information (VI)**. Use of one or more of the various visual media 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. (CNETINST 5290.3).

- **Instructional Media Materials (IMM)**. 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

Visual Information Materials are used to introduce, reinforce or supplement training provided in the formal environment. They may be used separately, with other VI, or with a lesson plan. Use VI to:

- 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

Because of its wide range of applications and uses, ***INTERACTIVE COURSEWARE (ICW)*** is ***NOT*** addressed in this chapter as audio/visual media. CNETINST 1500.21, OPNAVINST 1500.73 and DODINST 1322.20 address analysis, development, and application of ***ICW.***

SECTION 1.0 VI MATERIALS AND IN-HOUSE CURRICULUM DEVELOPERS

- Because of the requirements of governing 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 produced in accordance these directives

Development of professional-looking, pedagogically effective **VI** materials is costly and time consuming. NAVEDTRACOM 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 CNETINST 5290.3 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 2.0 PROCEDURES FOR SELECTING VI

Each VI has its own unique application and contribution to learning. Many factors must be considered by the curriculum developer when determining the type(s) of VI 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 selected should be that VI which, in the curriculum developer's judgement, best supports the learning objectives based on an evaluation of the course.

- VI materials selection and application has three basic components
  - 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 to support given learning objectives
  - Pilot – Evaluates all VI developed for a given lesson topic/course in the actual training environment to determine accuracy and adequacy in support of the learning objectives. Completed at the same time other course materials are piloted
- VI selection factors are discussed in the following paragraphs

SECTION 3.0 VI NEEDS ASSESSMENT

- Follow the steps listed below to complete your VI materials Needs Assessment

  - Evaluate the *Topic Learning Objectives* **(TLO)** in a lesson topic using the questions listed below

    – Would VI Aids enhance "Hands On" Training?

    – Would VI Aids enhance understanding of the Learning Objective?

- Continue with the following steps if you answered "*Yes*" to either of the above questions. All "*No*" responses indicate VI materials may not be appropriate

  - Evaluate the LO(s) against the VI characteristics (applications, advantages, disadvantages and cost considerations) listed in the VI characteristics outline on the following pages to determine the type(s) of **VI** which best supports the learning objective(s)

  - Review LOs to determine if multiple learning objectives could be supported by a single VI (ie. videotape or slide presentation)

  - Repeat the process until the VI Needs Assessment has been completed for each lesson topic

SECTION 4.0 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 5.0 VI CHARACTERISTICS TABLE

(Applications, advantages, disadvantages, and cost considerations)

5.1 Audio Presentation

- 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
- 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
- DISADVANTAGES
  - Susceptible to outside distraction if earphones are not used
  - Fixed rate of information flow; therefore, adjustments to learning rate are difficult

- COST CONSIDERATIONS
  - When recordings are produced locally with existing recorders the cost is very low. Audio tape recorders/players are inexpensive.
- DEVELOPMENT PROCEDURES
  - In accordance with CNETINST 5290.3. See your command's VI Manager

5.2 Slide Presentation

- 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
  - May be programmed by a Lesson Plan, audio cassette or other software
  - Supplement or reinforce discussion points within a topic
- 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

- 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

- COST CONSIDERATIONS
  - Individual slides are relatively inexpensive to produce. The major cost of slide presentations is development of the audiovisual 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.

- DEVELOPMENT PROCEDURES
  - In accordance with CNETINST 5290.3. See your command's VI Manager.

5.3 Transparency

- APPLICATIONS
  - Transparencies 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

- ADVANTAGES

  - Easy to prepare

  - If you have a copy machine, you can make transparencies

  - Easy to revise and resequence

  - Require few environmental adjustments

  - Require only an overhead projector

- DISADVANTAGES

  - Very few

  - In large quantities, may be difficult to use and store COST

- CONSIDERATIONS

  - Simple text and graphics transparencies 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.

- DEVELOPMENT PROCEDURES

  - OPNAVINST 5290.1A, encl. (1), para. 3-1-f 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.

5.4 Video Tapes

- 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 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 Lesson Plans

  - 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

  - Are programmed by a Lesson Plan

- ADVANTAGES
  - The immediate search and playback capabilities permits greater utilization of the learning effort
  - Familiarity of the average trainee with the equipment minimizes distracting novelty effects
  - Video Tapes 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
  - "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
- DISADVANTAGES
  - Tape size and format differences make video tapes incompatible with some types of video playback equipment
  - Playback units/systems are expensive
- 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.

- DEVELOPMENT PROCEDURES
  - In accordance with CNETINST 5290.3. See your command's VI Manager.

5.5 Wall Charts (WC)

- 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 Lesson Plan
    - Directs the Instructor to provide information while addressing the Wall Chart as a visual to amplify the information being presented
  - In general, Wall Charts
    - 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

- ADVANTAGES
  - Require fewer environmental adjustments than projected visuals
  - Not dependent upon availability and operability of projection equipment
- 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
- 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.
- DEVELOPMENT PROCEDURES
  - In accordance with CNETINST 5290.3. See your command's VI Manager.

SECTION 6.0 ON-THE-JOB TRAINING (OJT) HANDBOOK

6.1 Information

- **IMM** is a self-supporting, "stand alone" instructional package. The OJT Handbook is the most common IMM, and may be the IMM most often produced by in-house curriculum developers (For some facilities the Exerciser Controller Guide may be most common). 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

6.2 Applications

- Consists of a single lesson or a series of lessons designed to support selected learning objectives
- In effect, a self-study learning package
- Requires 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

6.3 Advantages

- Each trainee can proceed at a rate in accordance with his 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

6.4 Disadvantages

- Long development time

- Rely heavily on the reading ability of the trainee

6.5 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.

  SEE ***ADDENDUM 9-A*** FOR DEVELOPMENT PROCEDURES.

SECTION 7.0 EXERCISE CONTROLLER GUIDE

7.1 Information

- **The Exercise Controller Guide (ECG) is another form of self-supporting, stand-alone IMM**. The ECG provides a set of training exercises.
  - Exercises can be used in either the formal or informal training environment
  - ECGs are used primarily for team training exercises, but may also be used to train the individual
  - Exercises consist of operational scenarios and selected training procedures
  - Scenarios and/or procedures are designed to accomplish specific, predetermined training objectives

7.2 Applications

- An *Exercise Controller* administers the exercises contained in the ECG
- In the formal training environment the Exercise Controller may use the ECG
  - For demonstration purposes
  - To administer laboratory exercises
  - As a guide for use with operational trainers

- In the informal training environment the Exercise Controller may use the ECG as a stand-alone document
  - To conduct independent training

7.3 Advantages

- The ECG can be used to satisfy specific operational and laboratory training requirements at both individual and team levels
- The ECG can serve to assess trainee/team proficiency across the entire spectrum of operational or laboratory tasks, indicating areas where further training is required
- The ECG can be used to assess trainee or team proficiency, operational readiness, or both
- Training may be accomplished at convenient times
- Training may be repeated as necessary

7.4 Disadvantages

- Development time may be long
- The end-user, particularly if an operational unit, may lack the wherewithal to develop an ECG, as a skilled curriculum developer is usually required to develop an ECG

7.5 Cost Considerations

- The cost for developing an ECG(s) is likely to be quite low as these are usually in-house or schoolhouse efforts

SEE THE ***VOLUME 1 SUPPLEMENT*** FOR DEVELOPMENT PROCEDURES

SECTION 8.0 SUMMARY

Development of the appropriate **VI** materials and **IMM** starts when all Learning Objectives for the course have been evaluated and the type or types of instructional support has been selected. **VI** materials, other than simple transparancies that can be developed locally, require liaison with the command's **VI Manager**. Step-by-step procedures 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 Learning Objectives are adequately supported.

SECTION 9.0 WHAT IS NEXT?

- Start development of the VI or IMM as soon as possible after
  - All learning objectives for the course have been evaluated
  - The type or types of VI or IMM needed to support them have been selected
- Pilot all VI and IMM
  - With the other course materials you have just developed as part of the new or revised curriculum
  - To determine if the learning objectives are adequately supported
  - See Chapter 10 of this manual for additional information

ADDENDUM 9-A

ON-THE-JOB TRAINING (OJT) HANDBOOK

SECTION 1.0 ON-THE-JOB TRAINING HANDBOOK 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 Learning Objectives do not currently exist, refer to Chapters 3, 4 and 5 of this manual for analysis and development procedures prior to continuing.
  - Evaluate Learning Objectives and determine the overall goal or theme of the OJT Handbook
  - Evaluate Learning Objectives 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 Learning Objectives of the OJT Handbook in a logical teaching sequence
- The Learning Objectives 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 Learning Objectives. 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:

- LEARNING OBJECTIVES
  - 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 trainees' knowledge of the lesson Learning Objectives
  - The results of the Lesson Pretest are used to direct trainees to specific study assignments to correct the identified weaknesses
  - Use the procedures for Test Item Development contained in Chapter 8 of this manual
  - One question per Learning Objective 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. 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 Learning Objectives 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 Learning Objectives 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 a **OJT** Handbook are 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 Learning Objectives, 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 **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 Learning Objective(s) being supported
  - Classification markings are appropriate
  - Lesson sequence supports the OJT Handbook outline
  - Each knowledge lesson Learning Objective is tested on the Lesson Pretest
  - Each question on the Lesson Pretest has a corresponding question on the End-of-Lesson Test

STAGE FOUR

CHAPTER 10

PILOT AND IMPLEMENTATION APPROVAL

INTRODUCTION

In this chapter, the products developed 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 the approval of the Curriculum Materials for implementation.

> The Foreword and How to Read NAVEDTRA 131A contain guidelines for reading this manual – you should read them now if you have not already done so.

CHAPTER'S SCOPE

- Provide an understanding of the process of validating curriculum materials
- Explain the terms which apply to pilot and implementation
- Describe the step-by-step procedures for piloting Curriculum Materials

SECTION 1.0 PILOT TRIAL

A pilot trial 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 in attaining the Course Objective(s).

1.1 Implementation

At the conclusion of the course pilot, and after corrections indicated by the pilot have been incorporated into the course materials, the course is implemented by issuance of a Letter of Promulgation by the *Curriculum Control Authority* (CCA). Formal training commences at all designated sites.

1.2 Pilot Trial Procedures

- Volume III, Chapter 6 provides detailed information on conducting a course pilot and subsequent implementation
- The procedures of Volume III, Chapter 6 are generally applicable to pilot convenings of contractor-developed courses

1.3 Implementation Procedures

- A pilot trial serves to validate a Curriculum and its Supporting Materials. Implementation includes formal approval of the course for instruction and placing it on line.
  - Revise the material as indicated by the pilot
  - CCA issues Letter of Promulgation

- Following implementation, emphasis shifts to training course management and curriculum maintenance – the subjects of NAVEDTRA 135A: *Navy School Management Manual*

NAVEDTRA 131A - VOLUME 1
KEYWORD LIST

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Audit 1-1-2, 1-3-2, 1-4-4
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