

STANDARD OPERATING PROCEDURES (SOP)
FOR
THE COAST GUARD'S TRAINING SYSTEM

Volume 7

Advanced Distributed Learning (ADL)



Coast Guard Force Readiness Command
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The Performance Technology Center, Design and Development Branch, strives to improve the Advanced Distributed Learning (ADL) SOP on a continual basis. Please email questions and suggestions on how to improve it to ADLSOP@uscg.mil.

SECTION I: INTRODUCTION

Introduction

Advanced Distributed Learning (ADL) is a digital solution that provides access to high-quality learning and performance aids. ADL solutions can be delivered cost-effectively and at the right time and place for the learner. Solutions bring together state-of-the-art technology and networking capabilities. ADL provides opportunities for improvement and enhancement of traditional performance solutions.

This Standard Operating Procedure (SOP) manual describes the process for identifying, requesting, designing, developing, implementing, and maintaining Coast Guard Advanced Distributed Learning (ADL). This SOP and its appendices document the process, the participants and the requirements for initiation and lifecycle of an ADL solution. This includes typical development milestones, as well as piloting, and implementation practices and the lifecycle sustainment plan that is required for every ADL solution.

Understanding and Using SOP7

There are several target audiences for this SOP. For the Program Manager or Project Sponsor who is seeking an ADL solution to support job performance, understandable information on the process is provided, along with a guide to getting started. Training Managers and consultants will benefit from information to help with decision making in selecting an ADL solution and with planning the ADL project. For internal to the Coast Guard and externally contracted ADL projects, more detailed information including deliverables and processes that must be followed are included. All phases of an ADL project are presented so information is included for consultants, designers, developers, ADL Project Officers, and ADL solution evaluators.

This SOP is constructed of a series of appendices that provide standards, guidance and requirements for ADL products and projects. Each appendix focuses on a specific component of ADL solutions.

To navigate to the appendices and areas within an appendix:

- Click on the Table of Contents at the front of the SOP
 - Click on the Table of Contents within the appendix
 - Click the heading in the bookmarks as they appear in the left panel of the SOP PDF.
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SECTION I: INTRODUCTION (Continued)

Understanding and Using SOP7, continued

The SOP is written to be a useful guide and to provide tools to initiate, analyze, design, develop, implement, evaluate and sustain ADL products. Organizing features include:

Items in text boxes are requirements or highlights.

Useful tools are provided to print and utilize in managing, designing, developing, delivering, evaluating and sustaining ADL products. They are integrated into the bodies of each appendix but clearly identifiable.

Appendix Contents	
Process	Flow chart of the overall ADL process and flow charts specific to the ADL delivery format (Self-Paced eLearning, Electronic Performance Support Solution, etc.)
Requirements	Requirements shall be followed in the process of producing ADL solutions
Job aids	Charts and tables to guide the user in various aspects of producing ADL solutions
Cautions and warnings	Information on how cautions and warnings are to be delivered in an ADL solution. This includes accepted color coding for items that require a caution or warning in a product.
Checklists	Tools to guide the designer and developer in producing deliverables and to be used by the ADL Project Officer when evaluating those deliverables
Worksheets	Tools to use for guidance in an ADL consultation and in the production of an ADL solution
Examples	Actual examples of the deliverables are included

SECTION I: INTRODUCTION (Continued)

Feedback for Improvement

The ADL SOP7 will improve with users' input and feedback. Please forward comments, questions, corrections, and suggestions to:

ADLSOP@uscg.mil

Finding Information

Appendices contain requirements and standards that guide the process for developing ADL solutions. Any deviation from this SOP requires a waiver from the ADL Program Office. Appendix A: Getting Started provides entry guidance for ADL process participants.

Information resources provided at the CG Portal (<https://cgportal.uscg.mil/delivery/Satellite/trained>) extend the ADL SOP with information support and instructions specifically for unit level consumers. The United States Coast Guard (USCG) ADL Program Office can provide access upon request to the ADL Community Collaboration Site (<https://cgportal.uscg.mil/lotus/myquickkr/advanced-distributed-learning-adl>) for timely resources, updates, and information.

Note: To access the above website, members of the CG ADL solutions community must request permission through the ADL Program Office.

Definition: ADL Solution

ADL is defined as distance learning that leverages the full power of computer, information and communications technologies to tailor instruction and its delivery to support individual/organizational learning needs. ADL is structured learning or performance support that may be self-directed, self-paced, facilitated, or any combination of these access methods. An ADL solution typically includes one or more of the following: electronic performance support solutions (EPSS), interactive electronic technical manuals (IETMs), interactive technical publications (IETPs), and self-paced eLearning (SPeL). These solutions are distributed through various media, including the Internet, audio tapes, DVDs, CD-ROMs, and video conferencing

ADL solutions may be part of a resident instruction course, a pre-requisite for resident instruction, or stand-alone performance support.

SECTION I: INTRODUCTION (Continued)

Intent of SOP

This SOP covers all phases in the development and lifecycle sustainment of any component within the following ADL product classifications:

- Self-paced eLearning and multimedia tutorials
 - Instructor-led online learning (synchronous or asynchronous)
 - Part-task training simulations
 - Packaged performance support solutions (multi-media, electronic performance support, interactive electronic technical manuals)
-

Function of ADL Program

The Coast Guard's ADL Program is primarily concerned with solutions that span the needs of the entire organization, but may engage to support common demands on a smaller scale. This SOP does not cover development and lifecycle sustainment of high fidelity training simulations like the fixed facilities found at Aviation Training Center, the Coast Guard Academy, and Training Center Petaluma.

SECTION I: INTRODUCTION (Continued)

Document Guide

This SOP includes specific guidance, technical information, and examples. These are organized as:

- **Appendix A: Getting Started** provides a task-oriented transition from the core of the ADL SOP into the more technical components. It covers the entry points for any customer, associate producer, program manager, training manager, or contracted service provider.
 - **Appendix B: ADL Resource Description** explains the ADL system tools and available services. It provides a clear picture of the current system state.
 - **Appendix C: Common Processes and Forms** outlines all common processes and forms associated with ADL solution identification, development, and evaluation.
 - **Appendix D: Common Technical Requirements** lays out the common technical standards and delivery requirements that apply regardless of solution track.
 - **Appendix E: Self-Paced eLearning (SPeL) Standards Guide** provides standards and styles for SPeL elements. This includes processes and technical/delivery standards specific to SPeL development.
 - **Appendix F: Electronic Performance Support Solutions (EPSS) Standards Guide** defines standards and specific processes for design, development, and delivery of EPSS.
 - **Appendix G: Virtual Classroom Guide** includes a definition of the virtual classroom, a distance facilitator's guide, and processes for appropriate deployment within the environment.
 - **Appendix H: Combining ADL and Traditional Training** (blended learning solution) provides guidance for combining ADL and traditional solution types. The guide presents case studies and selection tools to help with integration.
 - **Appendix I: Media Selection Process** is a brief guide for selecting media. The Human Performance Technology/Instructional Systems Design (HPT/ISD) Handbook (TRACENINST 1550.1) provides a higher level view for media selection whereas this guide provides more detailed guidance.
-

SECTION II: PURPOSE

Purpose

The ADL SOP is part of a network of training system SOPs intended to support the business rules and goals of FORCECOM and the USCG Training System. These goals include partnering with Program Managers to:

- Pursue integration of ADL solutions with traditional solutions where appropriate. Value may be gained from conversion of part or all of an existing resident course to an ADL solution component.
- Create or convert Mandated Training (MT) and Workforce Training (WT) to best meet the needs of Coast Guard men and women while meeting organizational requirements.
- Engage in processes to resource the entire lifecycle of ADL solutions.
- Provide Program Managers the information they need to initiate an ADL solution.
- Capture statistical evidence for evaluation of ADL solutions.

The ADL SOP assumes that ADL development follows an appropriate analysis and media selection process as described in the USCG Training System SOPs. ADL solutions must focus on the needs of the performer and on producing measurable performance change for the organization.

The ADL SOP also provides benchmarks for Programs to use in planning and resourcing the lifecycle of an ADL product. To service all roles within the Coast Guard ADL and training communities, the guide includes examples of contract guidelines, planning documentation, and lifecycle sustainment documentation.

SECTION II: PURPOSE (Continued)

Target Audience

The audience for the ADL SOP includes all members of the Coast Guard who sponsor, design, develop, or deploy enterprise ADL solutions. This may include:

- Training Managers
 - Program Managers / Customers
 - Human Performance Technology (HPT) practitioners
 - Product Designers and Developers (Internal/Contract)
-

Funding

The ADL Program Office ensures that funding is provided for the ADL infrastructure that transports solutions to the appropriate destination. Lifecycle costs for each solution are determined during the alignment phase of the ADL solution. Resources are provided by the responsible program to cover production and maintenance costs for each solution. For more detailed information on available funding options, see Appendix C: Common Processes and Forms.

SECTION III: BACKGROUND

Mission of ADL Program

The Coast Guard ADL Program strives to support mission excellence by providing digital, hybrid, and complementary performance and training solutions that are:

- Conveniently accessible when and where needed
- Consistent and relevant to the performer's world of work
- Measurable and/or trackable, providing visibility and accountability
- Sustainable over the lifecycle of the problem

The USCG has been delivering ADL solutions Coast Guard-wide since 2000. Organizational perspectives and infrastructure change routinely, technology and capability advance almost daily, and the sophistication of the audience and culture that these ADL solutions serve continually evolves.

The formalization of ADL solutions matures in pursuit of the answers to these questions:

- How can ADL solutions be leveraged to meet critical performance support objectives and achieve the Coast Guard's organizational goals?
- How can we align and integrate ADL business processes with traditional training system processes?
- How can we successfully distribute and track, as appropriate, ADL solutions using the Coast Guard Enterprise Information Technology (IT) Architecture?

The USCG ADL Program, including internal partners and a community of solution developers, strives to evolve and adapt processes and approaches to sustain lasting connections between traditional solutions and ADL solutions. The program is dedicated to the creation of digital solutions that are supported by the CG's IT infrastructure while providing the right learning and performance solution at the right time.

The ADL Community provides consultation, analysis, and solution development services to:

- Assist program clients in solving new or existing problems
 - Optimize costs
 - Extend or complement a traditional performance or training solution
-

SECTION III: BACKGROUND (Continued)

Philosophy

The goal of an ADL solution, including a digital or hybrid/blended solution, is to deliver high quality performance support and training that is accessible to the Coast Guard community at the right time and in the right place. The USCG uses ADL technologies as they evolve to meet the learning and training needs of adult learners. Adult learners typically prefer and respond more favorably to learning and support materials that present these qualities:

- Learning and performance support that is task or problem-centered vice content-centered
- Performance support that is relevant to a learner's world of work
- Learning experience that is self-directed and self-paced vice prescribed and rigidly structured
- Learning solutions that adapt to and build on the learner's prior experiences vice assuming a generalized audience
- Information that is relevant to current needs or interests
- Solution that is well organized and easy to use

A successful ADL strategy clearly articulates the relevant relationship between the training and the job performance whenever possible. Adult learners benefit from specific feedback. Adult learners may also need varied practice activities to optimize retention and accelerate skill acquisition.

Coast Guard ADL solutions must support the needs of the performer and produce measurable positive performance change in pursuit of the organization's missions. These general principles guide all ADL solutions developed for the United States Coast Guard:

- Transfer of training or support to work performance is the desired outcome of any Coast Guard performance support or training product. "The Coast Guard Training System's mandate is to supply skills and knowledge in the most effective and efficient manner as a way to improve job performance." (Reference: COMDTINST 1550.9A). A performance analysis and training needs analysis guides and informs all solution decisions.
 - Acquisition and improvement of skills is most effective when the elements of the work situation are introduced into training in ways that:
 - Closely emulate the environment
 - Engage learners in the work performance
 - Provide opportunity to experience the consequences of the work performance
 - Allow the kind of variation in the work environment that demands the learner to adjust their performance
-

SECTION III: BACKGROUND (Continued)

Philosophy, continued

Coast Guard men and women are primarily dedicated to the work and missions of the service. Training and performance support must not add unnecessary distraction or burden to Coast Guard performers. Specific to the design of a digital learning experience, consider the following as values for the successful delivery of any ADL product:

- The product design and packaging must be respectful of the performer's time and environment
- The product design must be focused on value and relevance

These conditions establish the central theme for Coast Guard ADL process philosophies. The solution type, curriculum outline, each design and development milestone, and the final ADL product must adhere to these values.

SECTION IV: PROCESSES

ADL Business Processes

If an analysis recommends an ADL solution, the ADL business processes and workflow are triggered by the Program Manager or Training Manager. The process is designed to minimize risk to scope, schedule and quality of the final product.

The production of any ADL solution follows the same basic flow:

Pre-Design	The type of ADL development or acquisition is determined in this phase. Selections may include existing commercial off-the-shelf (COTS), government (GOTS), or custom developed solutions. Pre-design analysis is conducted.
Design	In this phase, the ADL solution is planned and designed, and risks managed through incremental deliveries to the customer. This phase results in the delivery of scripts and storyboards.
Development	The output of this phase is a solution compliant with all requirements outlined in this SOP. The workflows for COTS/GOTS acquisition and new development differ slightly. (See Appendices C through H dependent upon the type of solution.)
Acceptance Testing	Testing includes focus group testing using a learner population sample as well as acceptance testing for compliance with the technical requirements (Appendices D through H).
Deployment	The ADL solution is distributed to the target audience.
Evaluation and Lifecycle Sustainment	Monitoring and feedback loops that go back to the training manager are part of this phase. This evaluation ensures the performance solution continues to match performance requirements.

Appendix C: Common Processes and Forms describes the process flow for the lifecycle of an ADL solution. Solution specific process flows are included in other appendices.

SECTION IV: PROCESSES (Continued)

Maintenance and Sustainment

Even solutions with stable content and performance characteristics will need periodic review and maintenance over the lifecycle to ensure continued viability. The maintenance and sustainment requirements for each ADL solution effort will be determined in the alignment agreement and must be accepted as the client or sponsor's responsibility prior to development of the solution.

USCG Training System SOP 7 Appendix A

Getting Started

I. Appendix Overview

This appendix extends **Training System SOP 7 (ADL)** with guidelines and support tools to help any member starting or considering an ADL project.

This appendix references other appendices within this SOP as well as other Training System SOP volumes.

When you are ready to initiate an ADL service request, print the checklist at the end of this appendix.

Introduction

So, you've determined that an Advanced Distributed Learning (ADL) product may help you meet your mission requirements or solve a problem in the field. You may have arrived at this conclusion as the result of a mandate, the results of a performance analysis, or following a consultation with a digital solution specialist who has experience and knowledge of ADL solutions and products. The process for getting started is identical no matter what type of ADL product is desired.

This appendix is intended to help stakeholders and participants prepare for each activity in the solution development and sustainment process. Start by reading through the Frequently Asked Questions below. Use these questions to begin your quest for an ADL solution.

Frequently Asked Questions:

- What is an ADL solution?
- I think ADL could be the solution to my problem. Where do I begin?
- How is ADL selected as the appropriate solution?
- What process does the USCG use to produce or acquire an ADL product?
- How do I know ADL is doing what it's supposed to do?
- What do I need to commit to maximize success?
- How do I publish content into the available ADL systems?
- Where can a contractor find GFI to help build products that meet USCG expectations?

II. Guidelines and Answers

Use this section to answer common questions related to the selection, production, and lifecycle sustainment of an ADL solution.

What is an ADL Solution?

ADL is a classification of digital solution that provides convenient and consistent access to job and learning support resources. ADL solutions:

- **Reach** employees who otherwise wouldn't have the opportunity as a result of resource constraints or mission priority
- Support employee **convenience**. Members can access these solutions on their own schedule, whenever and wherever they need performance and learning support
- Provide **consistency** in content and message quality
- Provide **accountability** and measurement through an automated tracking system

A few examples of ADL solutions	
SPeL	A self-paced eLearning course for mandated topic orientation.
EPSS	An electronic performance support solution to support air conditioning maintenance.
Mobile	An embedded mobile solution supporting orientation for alien migrant interdiction (AMIO) processing procedures at sea.
IETM / IETP	An interactive electronic technical manual (IETM) / interactive electronic technical publication (IETP) to support a performer's work with a newly acquired piece of equipment.
VT	A virtual tour of a new vessel to provide crews pre-arrival orientation.
CBT	A computer-based training solution packaged on CD-ROM for aviation training.

It's important to understand that ADL is ONE solution among many available in the USCG Human Performance Technology (HPT) cycle. ADL can complement, supplement, and synergize with other traditional solutions! As you select an ADL solution, try to consider how the selected piece will fit into the landscape of work as well as how the solution might leverage or amplify the power of other solution sets.

I think ADL could be the solution to my problem. Where do I begin?

The Program Manager should initiate a discussion with the Advanced Distributed Learning (ADL) Program Officer within FORCECOM. The ADL Program Officer has access to a variety of resources to support digital solutions consultation. For example, the Performance Technology Center (PTC) specializes in HPT Solutions and works in strategic partnership with the ADL Program Office to ensure the appropriate level of specialized support. In addition to a staff with strong background in human performance technology (HPT), Digital Solution Consultants (DSC) have experience and expertise in selecting, estimating, designing, and executing ADL solutions.

Contact any member of the ADL Program Office to begin the process; ADL program contact information is available on the CGPortal. Next, the Program Manager will consult with their Training Manager or performance consultant in FC-Tadl. The Training Manager or performance consultant will enlist guidance from the organization's DSC for specialized perspectives in ADL. The Training Manager / Performance Consultant and DSC team up to help you identify your requirements and the necessary resources, choose the appropriate approach, and provide you with next steps. If you have a recent analysis or current task list, share it with the FC-Tadl representative.

It is important to enter discussion with FC-Tadl personnel on your **business goals** and **performance requirements**. Avoid entering with assumptions based on the type of solution needed or the number of hours of training required. These factors, as well as the scope of the problem and the type of solution most suitable to solve the problem, will be discovered in the analysis and validated in the pre-design analysis.

How is ADL selected as the appropriate solution?

There are generally two paths to the selection of an ADL solution. The preferred path prescribes a front end analysis to discover all possible contributing factors to a performance gap. The second path prescribes a Rapid Task Analysis (RTA) to uncover the business case, identify all relevant tasks, and identify the associated skill and knowledge factors prior to engaging in the effort of producing a solution. For more information on RTA and the role of analysis in ADL solutions, see Appendix C.

The Training System SOPs and Front End Analysis Procedures provide a framework for high level selection of training and performance interventions. Training System SOP 2, the Analysis SOP, Appendix O, P, and Q outline solution selection criteria. The SABA Peak Performance System, Phase I Front-end Analysis, Sections 14 through 17 and Phase II, Training Design, Sections 4 through 9, also guide the selection and pre-design process that identifies training, job aids, job aids with training, or non-training solutions.

Using SOP and FEA support tools, performance analysts consider data from interviews of subject matter experts and accomplished performers to determine the best approaches for closing performance gaps.

If an ADL solution is determined to be a potentially suitable option, Training Managers and performance consultants should enlist the assistance of delegates of the ADL Program Office experienced in digital solution consultation to help narrow the solution field and assist with pre-design analysis prior to establishing a statement of work for services. If the ADL solution is mandated training (MT), see Appendix E.

Leverage available specialized resources whenever possible. Performance analysts should enlist assistance and consultation from solution specialists (ADL, resident training, etc.) when preparing solution recommendations and options for the final analysis report.

What process does the USCG use to produce or acquire an ADL product?

Sometimes an ADL product can be acquired as commercial or government off-the-shelf. If this is an effective and cost efficient product, the ADL program office will recommend it to the customer. To produce an ADL product there is a defined process which is shown in Section III below.

How do I know ADL is doing what it's supposed to do?

Evaluation is critical to the success of an ADL solution. Digital solutions undergo multiple stages of evaluation. In the design phase, content may be validated by multiple parties including field personnel before development begins. Post development evaluation methods may vary by solution type. Over the lifecycle of the solution, data may be collected by methods such as linking a user survey to the end of the SPeL course, conducting a follow-up survey of users of the EPSS, or providing an e-mail location where feedback and comments may be posted. More detail can be found in Appendix C.

See your ADL Project Officer for specific solution evaluation requirements and recommendations. You will be assigned a Solution Lifecycle Manager (SLM) who will help with long-term evaluation of the solution.

I'm at a Training Center and I have a local service center that provides ADL development services. Do I still need to go through the Program Manager to service my needs?

Targeted blended media elements, complementary media based activities, and local assessment tools do not require approval beyond the Training Division. If additional resources or curriculum outline changes are required, contact the Training Manager or Program Manager for approval. Contact the ADL Program staff with any questions concerning enterprise deployment.

Wider reaching efforts, such as those distributed to the enterprise, or efforts that require additional resources (including the leverage of the internal resources of other units like the PTC), changes to curriculum outline, or lifecycle sustainment commitment **must** be routed through the Training Manager and Program Manager.

As a Program Manager, what do I need to commit to the project to maximize success?

Program Managers provide several elements critical to the success of an ADL solution. This includes funding, vision, and access to subject matter experts. Clear goals, clear content, and reasonable engagement at each approval or review iteration cycle help propel an ADL solution's production to successful completion.

Once an approving official and subject matter expert(s) are identified, design and production can proceed with minimal Program Manager intervention. Expectations for level of engagement are identified during the initial project alignment.

Determination of the method for delivery of the ADL solution will be part of the project alignment process. (See Appendix C: Common Processes and Forms and Appendix E: Self-Paced eLearning (SPeL) Standards Guide for more information.) If an ADL solution will be distributed via the Coast Guard's Learning Management System (LMS), the Program Manager will need to coordinate this at product delivery with their Training Manager in FC-Tadl.

The Program Manager’s commitment to sustainment of the ADL solution over the product’s lifecycle is **critical** to the long-term success of the solution.

How do I publish content into available ADL systems?

All ADL systems are administered by the ADL Program Office. The table below describes methods for access to each ADL system. See Appendix C for system access and enrollment guidance.

Learning Management System	Content is published to the Learning Management System by system support personnel only. A test system is available to content service providers to validate technical compliance and functionality. If you need to publish a trackable courseware component, contact the ADL Program Technical Lead.
eSurvey (Vovici)	Accounts within the survey tool are limited. Submit a help ticket to request an account.
eTesting (QuestionMark)	Accounts within the eTesting tool are limited and tracked deployment requires creation of a course element in the Learning Management System.
EPSS (epss.uscg.mil)	Content is published to the EPSS Repository by system support personnel only. If you need to publish an EPSS component to the central repository, contact the Performance Technology Center.

Where can I find Government Furnished Information (GFI) to help me build products that meet USCG expectations and specifications?

For a link to available Coast Guard ADL GFI, contact the ADL Program Office (FC-Tadl) or the technical staff at the Performance Technology Center (FC-Tptc).

Who is involved in the selection, design, or development of an ADL solution?

Use this table to identify who will be involved in the process.	
ADL Program Office	The FORCECOM training office that coordinates ADL efforts for the Coast Guard will provide guidance, referral to digital solution consultants and access to a contracting vehicle, if needed.
Program Manager	The Program Manager initiates the solution request and will assign a signing authority for acceptance of incremental and final deliverables.
Training Manager	The Training Manager brokers the relationship with digital solution consultants and helps the Program Manager identify appropriate options and estimate potential lifecycle costs.
Performance Analyst / Performance Consultant	The performance analyst collects and analyzes data surrounding the performance gap, based on the business requirements and goals of the Program Manager and recommends solutions.
ADL Project Officer (ADLPO)	The Project Officer provides project management and project execution coordination for an ADL development effort.
Digital Solution Consultant (DSC)	The Digital Solution Consultant is a performance consultant with experience and expertise in digital solutions. The DSC provides solution selection, conceptualization, estimates and risk consultation to Program Managers, Training Managers, and performance analysts. The DSC is familiar with the USCG ADL requirements and deployment requirements.
Designer	The designer lends focus in a specific problem-solving area of expertise for the design of a solution. The organization employs designers internally and by contract across a wide range of expertise areas (instructional, technical, user experience, performance support). A designer may be involved in the selection, design, and development phases but is not necessarily a DSC.
Developer	The developer lends development (visual, interactive, assembly) expertise. Developers may also be involved in the selection, design, and development phases but is not necessarily a DSC.
Contracting Officer (KO)	The contracting officer is responsible for execution of any contracted effort and has final signing authority for acceptance of any delivery.
Contracting Officer's Technical Representative (COTR)	The contracting officer's technical representative (COTR) provides domain specific expertise in the review of delivery increments for any contracted effort.

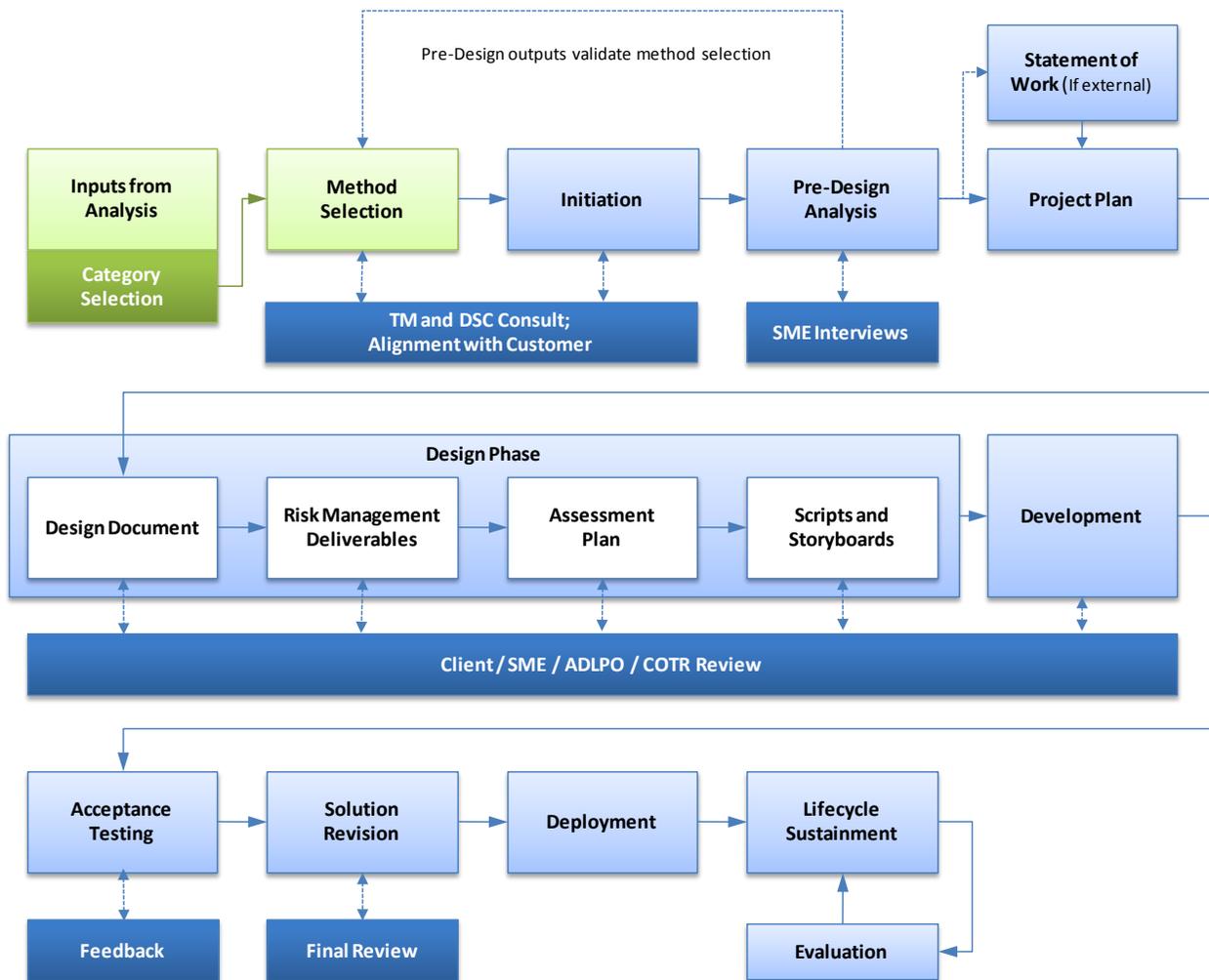
<p>Subject Matter Expert (SME)</p>	<p>A SME is a person most knowledgeable regarding a specific subject or piece of equipment; this is not necessarily the person with the most practical experience in the subject or the person who can best employ the piece of equipment – that would be the AP. Subject matter experts provide domain expertise that helps to define the content and context for ADL solutions. Appropriate selection of subject matter expertise is critical to the success of an ADL solution.</p>
<p>Accomplished Performer (AP)</p>	<p>An AP is the worker who routinely produces work at or above standard. The AP is considered the best performer now on the job; a person whose skill or performance exemplifies the optimal or desired state. APs provide content, review ADL products for accuracy and provide the benefit of their experience and expertise to the Designer and Developer of the ADL solution.</p>
<p>Solution Lifecycle Manager (SLM)</p>	<p>Solution Lifecycle Managers provide continuity from the initiation of the product through disposition of a supported asset. To maintain current and applicable ADL solutions, sustainment service is important. The SLM is assigned to and remains connected to the solution, providing reliable, accurate and consistent ADL solutions.</p>

III. Design and Development Process Overview

The flowchart below highlights the key phases of the general ADL design and development process for both the service provider and the client. See the table that follows for a description of each phase.

Appendix C: Common Processes and Forms, extends this definition of process with additional review and approval requirements. Appendices for specific product lines such as SPeL (Appendix E) and EPSS (Appendix F) contain specific deliverable requirements including models, checklists, and evaluation rubrics for many deliveries in each process flow.

ADL Process Flowchart



Use this table to define activities within each delivery phase.

Input from Analysis	A Front End Analysis and/or Rapid Task Analysis that clearly identifies the performance gap and associated tasks. (See Appendix C: Common Processes and Forms for more information.)
Category Selection	The category is represented by the solution recommendation output of an analysis. These categories are: <ul style="list-style-type: none"> • Job Aid • Job Aid with Introductory Training • Job Aid with Extensive Training • Training
Method Selection	The method further defines the solution category. Examples of methods include: <ul style="list-style-type: none"> • Electronic Performance Support Solution (EPSS) • Self-paced eLearning • Simulation / Modeling • Resident Training • Blended Solution
Solution Initiation	The Program Manager or Project Sponsor makes contact with their program's Training Manager or the ADL program office. The Training Manager will enlist an appropriate performance consultant or Digital Solutions Consultant to determine next steps.
Pre-design Analysis	The pre-design analysis defines the calculated scope of the effort, identifies primary stakeholders, validates the currency of analysis and task data, and documents the business goals of the Program Manager.
Statement of Work	When ADL solutions are to be designed/developed by external contractors, the first step is to produce a statement of work (SOW) or performance work statement that defines the work that the government needs to have done and the specifications and requirements.
Project Plan	All ADL projects, including those contracted externally, begin with an alignment agreement and a project plan. This document describes the process and timeline for the project.
Design Document	The design document describes the essence of the solution as it relates to the business goals and stated problem. This document also clearly identifies the target audience and articulates the tasks, performance objectives, and learning objectives the solution will serve.
Risk Management Deliverables	Required deliveries that provide incremental review and intentional risk controls for both the customer and the solution provider. Deliveries in this category include the Design Concept and Solution Flow .

Assessment Plan	The assessment plan outlines the assessment items or measurement items that will be used to prove the efficacy of the solution. In the case of a learning support product, assessment items must be delivered and approved before content storyboards.
Scripts and Storyboards	The storyboards define the content scope, flow, and experience that the solution will embody.
Solution Development	The solution is developed based on the blueprints established in the design document, solution concept, and storyboards. Unless noted in the SOW, a prototype is a conditional delivery intended to reduce risk for the client and the service provider.
Acceptance Testing	The solution is tested for compliance with technical standards and in accordance with the assessment plan delivered earlier in the process.
Solution Revision	The solution is revised by the service provider based on feedback from the ADLPO, SME, and Program Manager or manager's representative.
Deployment	The solution is deployed to Coast Guard infrastructure.
Lifecycle Sustainment	The project is closed and archived. The solution is tracked and sustained ensuring it continues to work for the intended purpose.
Evaluation	Solution is evaluated in accordance with the assessment plan established during the design phase.

***Note:** Solutions in the sustainment phase will be placed on a periodic review cycle that will be managed by the Program Manager in conjunction with the Training Manager. There are three possible outcomes from a review cycle:

- Solution still required and viable, review period reset
- Solution still required but content is out of date, send to **Solution Revision** phase and complete the cycle
- Solution not required, prepare for disposition and removal from enterprise environment

IV. Getting Started Checklist

Use this checklist to prepare for an initial consultation with your Training Manager, Performance Consultant, and Digital Solutions Consultant.

	I can fully describe the business need and goals for the solution.
	I have identified a Program Manager or champion who can support and sustain the solution.
	I have identified the audience for the solution. If the audience consists of multiple or a variety of different groups, I can describe each group.
	A recent performance analysis has been completed. I have a copy of the analysis report. If I don't have a performance analysis, I have a complete task list to describe performance goals.
	I have identified Subject Matter Experts and Accomplished Performers to support task and content validation.
	I have pertinent policy, doctrine, handbooks, manuals or other resources readily available.
	I have identified personnel to review deliveries for the duration of the solution design and development cycle.
	I have resources available to support the development of the solution and all necessary lifecycle support costs.
	I am prepared to commit to maintaining and evaluating the solution after deployment.
	I have established expectations for the timeline of delivery.
	I have an endorsement to proceed from my assigned Training Manager.
	I have identified whether results of the solution need to be tracked.

SECTION IV: PROCESSES (Continued)

Maintenance and Sustainment

Even solutions with stable content and performance characteristics will need periodic review and maintenance over the lifecycle to ensure continued viability. The maintenance and sustainment requirements for each ADL solution effort will be determined in the alignment agreement and must be accepted as the client or sponsor's responsibility prior to development of the solution.

USCG Training System SOP 7 Appendix B

Resource Description

I. Appendix Overview

This appendix extends **Training System SOP 7 (ADL)** with a description of the technical architecture that supports the ADL Program.

This appendix references other appendices within this SOP as well as other Training System SOP volumes.

The completion of this Appendix has been deferred until 2012.

USCG Training System SOP 7 Appendix C

Common Processes and Forms

I. Appendix Overview

This appendix extends Training System SOP 7 (ADL) with descriptions and examples of the common processes followed and forms used in the development of ADL solutions. Solution-specific processes that extend these common elements are found in Appendices E: Self-Paced eLearning Standards Guide, F: Electronic Performance Support Solutions Standards Guide, G: Virtual Classroom Guide, and H: Combining ADL and Traditional Training. ADL solution processes were broadly introduced and illustrated in Appendix A: Getting Started, and are clearly defined in this appendix.

Processes, requirements and forms in this appendix will be followed/used for ADL solutions unless otherwise noted.

Introduction

The analysis, solution selection, design, development, implementation and evaluation of ADL solutions are guided by the Coast Guard's Human Performance Technology (HPT) approach to problem solving and improving job performance in the field. In addition to performance factors, cognitive task factors that contribute to successful skill performance are particularly important to ADL solutions. Careful collection of cognitive task data will contribute heavily to the success of an ADL solution such as self-paced eLearning, resulting in more focused and measurable objectives and more relevant and valuable practice.

Frequently Asked Questions

- Where does Request for Analysis (RFA) fit into the process?
- What role does analysis play in the ADL process?
- What is Rapid Task Analysis?
- How are solution methods selected?
- What is pre-design analysis?
- What risks are introduced when a pre-design analysis is avoided?
- Why are cognitive factors important in an ADL solution?
- What are the phases of an ADL solution and the activities in each phase?
- What forms are needed to manage the development of an ADL solution?

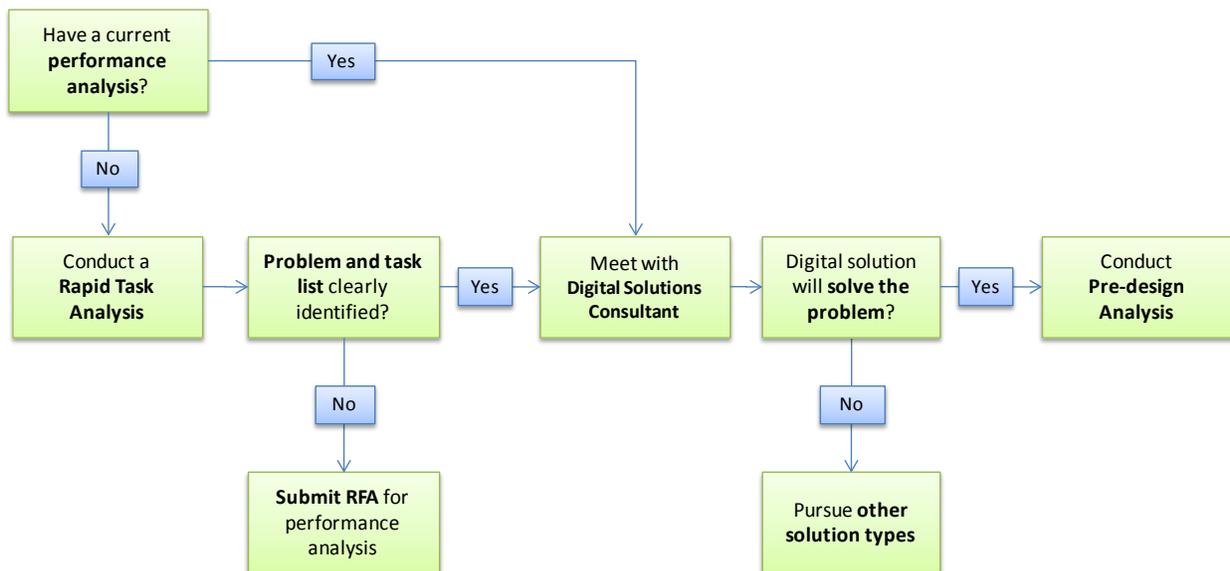
II. Guidelines and Answers

This section provides answers to common questions related to the ADL process, beginning with initiation and moving through solution, production, evaluation, and lifecycle sustainment of the ADL solution.

What role does analysis play in the ADL process?

The commissioning of a performance solution always begins with an analysis to identify problem factors. This analysis may begin with a rapid analysis or a more comprehensive Front-End analysis. Analysis is the first step in the process. For more information on performance analysis see Coast Guard Training System's SOP Volume 2: Analysis.

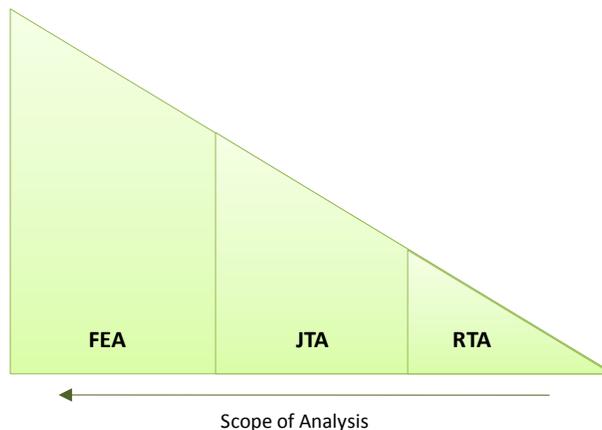
Front-End Analysis (FEA), Rapid Task Analysis (RTA) or a combination of the two will determine whether a performance solution is needed, what performance gap needs to be closed and if it can be efficiently solved with an ADL solution. The analysis will also supply a detailed task list to feed the next stage of the process. The task list serves as the basis for pre-design analysis and for discussions with subject matter experts (SMEs) or accomplished performers (APs). SMEs and APs will be advisors in the design and development of an ADL solution.



What is Rapid Task Analysis?

Rapid Task Analysis (RTA) is not a replacement for a Front-End Analysis of job performance. It is an alternative that focuses on skills/knowledge, provides less information and has a quicker turn-around than an FEA. RTA is a systematic process for identifying performance requirements at the task level before entering the pre-design phase of ADL solutions. An RTA provides inputs from which ADL solution designers build learning modules. In addition to providing a robust task list, RTA will:

- Validate the scope of the performance assumptions
- Identify primary SMEs and APs who will provide performance data
- Identify existing performance support content and references
- Confirm the business goal that the desired performance will meet
- Determine whether a more thorough Front-End Analysis is needed



During the RTA process, SMEs and APs will assist the analyst in organizing and prioritizing tasks and by providing step level data for more complex tasks. An RTA can be conducted prior to an FEA, between an FEA and the pre-design analysis or in place of an FEA if a solution must be rapidly deployed to meet an operational need. The outputs of an RTA are robust validated task lists and solution category selection. (Solution categories are: Train, Job Aid with Extensive Training, Job Aid with Introductory Training, No Train.) These outcomes feed into the Pre-Design Analysis.

Where does Request for Analysis (RFA) fit into the process?

An RFA (Training System SOP2) describes a performance problem or new performance for which there may not be any accomplished performers in the Coast Guard. RFA is the first step toward obtaining the expert assistance of a performance consultant in

documenting job performance and identifying the need for a performance solution—which may or may not require a training or performance support solution.

If RTA is inconclusive or does not produce data to support a performance support solution, then a Request for Analysis (RFA) will be recommended. This redirects the Program Manager to seek a performance analysis.

What is pre-design analysis?

Pre-design analysis bridges analysis to design. If the FEA or RTA indicates that a skills and knowledge performance gap exists and that an ADL solution will resolve it, then the validated task list prepares the Digital Solutions Consultant (DSC) or a designer:

- Confirm the business goals to be addressed by the solution
- Obtain agreement on the scope of the solution
- Define the audience of the solution
- Determine the performance objectives that the solution will fulfill
- Review the analysis of cognitive tasks as required
- Select and validate methods for the solution
- Validate task data with the appropriate performer level (novice, experienced, expert) to focus the solution.
- Conduct an independent government cost estimate

Questions asked during the pre-design analysis may include:

- Who will be receiving the ADL solution?
- What is their current skill state and experience?
- What prior knowledge can they be expected to have?
- What environment will they be in when using the ADL solution?
- Are reading and comprehension skills a consideration?

In Pre-Design Analysis phase, the designer will obtain agreement with the customer on the scope of the ADL solution and define what performance objectives are to be in the ADL solution. Method selection and validation are completed. The designer will experience the work situation during this phase, observing the job performance at the worksite by an accomplished performer and by a novice.

The outputs of a pre-design analysis include:

- Draft Alignment Agreement

- Estimated project cost
- Information needed to develop requirements for a Statement of Work (SOW) or Performance Work Statement (PWS) if the ADL solution will be contracted externally.

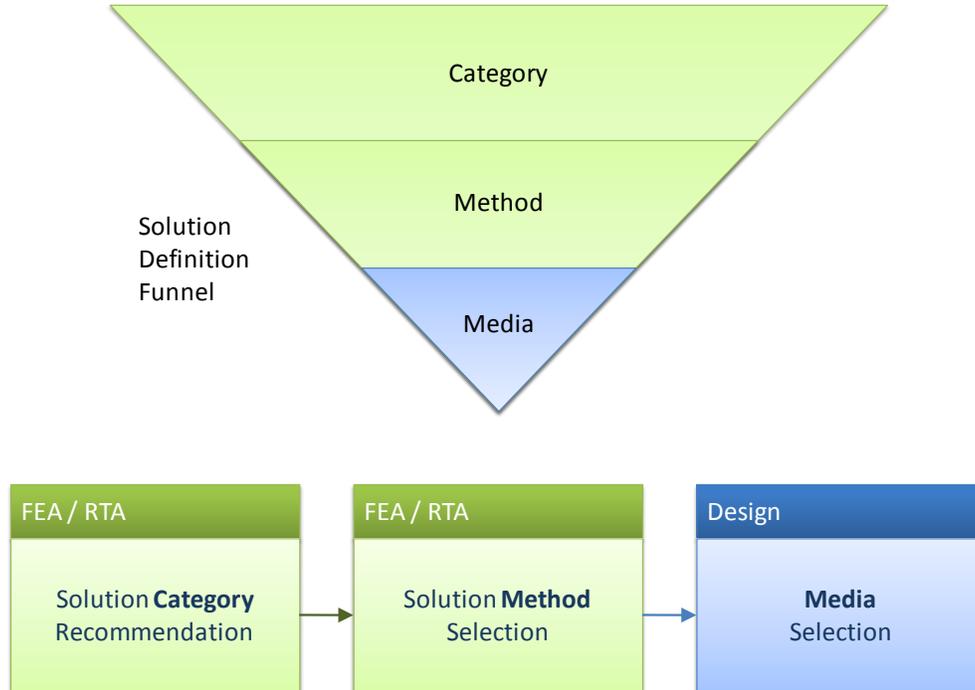
What risks are introduced when a pre-design analysis is avoided?

The consequences of ignoring a pre-design analysis can be significant.

Failing to clearly identify the problem or properly frame the solution will likely result in high risks for both the client and the solution provider. This can result in an overpriced contract, unnecessary scope creep, or a solution that fails to meet the needs of the target audience.

How are solution methods selected?

Solution selection is incremental and while there may be some overlap between activities, the outputs are different. The diagram below illustrates the layered filter used to determine the category, method, and media of an ADL solution. A category provides a broad intervention selection, while a method provides a more specific mode of solution. Each layer of the filter may produce several probable category, method, or media selections.



The **category** is represented by the solution recommendation output of an analysis. These categories are:

- Job Aid
- Job Aid with Introductory Training
- Job Aid with Extensive Training
- Training

The **method** further defines the solution category. The method selection is determined with the assistance of a Digital Solutions Consultant or other solution specialist using the FEA / RTA data and is validated by the pre-design analysis. A cost comparison of methods can help to narrow the field of selections. Methods can include:

- Electronic Performance Support Solution (EPSS)
- Self-paced eLearning
- Simulation / Modeling
- Resident Training
- Blended Solution

The identification of specific applications for **media** should include a design / media specialist to prevent unnecessary or inefficient selections. See Appendix A, Getting Started for a list of the roles involved in the specification and design of a solution. The application of specific media selections can include video, interactions, and illustrations and the various types that these selections can manifest.

S&K Solution Category Recommendations (Output of Analysis)					Determined by Performance Analyst
Job Aid	Job Aid with Introductory Training	Job Aid with Extensive Training	Training		
Solution Method Selection (examples)					Determined by Performance Analyst working with Digital Solution Specialist
EPSS	SPeL	Modeling / Simulation	Resident Training	Blended	
Media Selection (design level examples)					Determined by Designers / Developers
Video	Interaction	Text	Illustration		

As mentioned, each layer may produce several probable selections. The final selection from each layer should consider underlying factors of each task or task group in addition to the resources available from the program sponsor.

Analysts and specialists are encouraged to leverage the ADL community's expertise in the selection of the category, method, and media.

Why are cognitive task factors important to an ADL solution?

Rapid changes in work performance in organizations and the introduction of more complex systems and equipment can produce a heavier focus on decision-based skills, such as troubleshooting, than tactile activities. FEA processes typically focus on observable behavior and don't consider the critical decisions and cognitive processes that separate an expert performer from a novice performer. Task-based training focuses on what performers DO, while a cognitive focus identifies what expert and novice performers think about before, during and after each job task. This is especially critical for SPeL as it is nearly impossible to write measurable objectives without cognitive task data and the decisions that drive the actions/performance.

Asking SMEs and APs questions such as: "What are you thinking when you perform this task?"; "How do you know when the performance of this task is needed?"; and following adaptive questioning to uncover the optimal decision making pathways can help to reveal critical cognitive tasks. Using cognitive factors, ADL solution designers and developers can accurately match available methods to all performance factors, write accurate and measurable objectives, and best tune information presentation methods for the digital solution.

The goal is to maximize the impact of the ADL solution for performers. Cognitive task analysis, as a component of Rapid Task Analysis, will be addressed in more detail in Appendix E: Self-Paced eLearning Standards Guide.

What are the phases of an ADL solution and the activities in each phase?

The phases of an ADL solution are:

- Category selection
- Method selection
- Solution Initiation
- Pre-design Analysis
- Design
- Development
- Acceptance Testing
- Deployment
- Evaluation
- Project Closure and Solution Sustainment

See Section III of this appendix for a more detailed description of the activities involved in each of these phases.

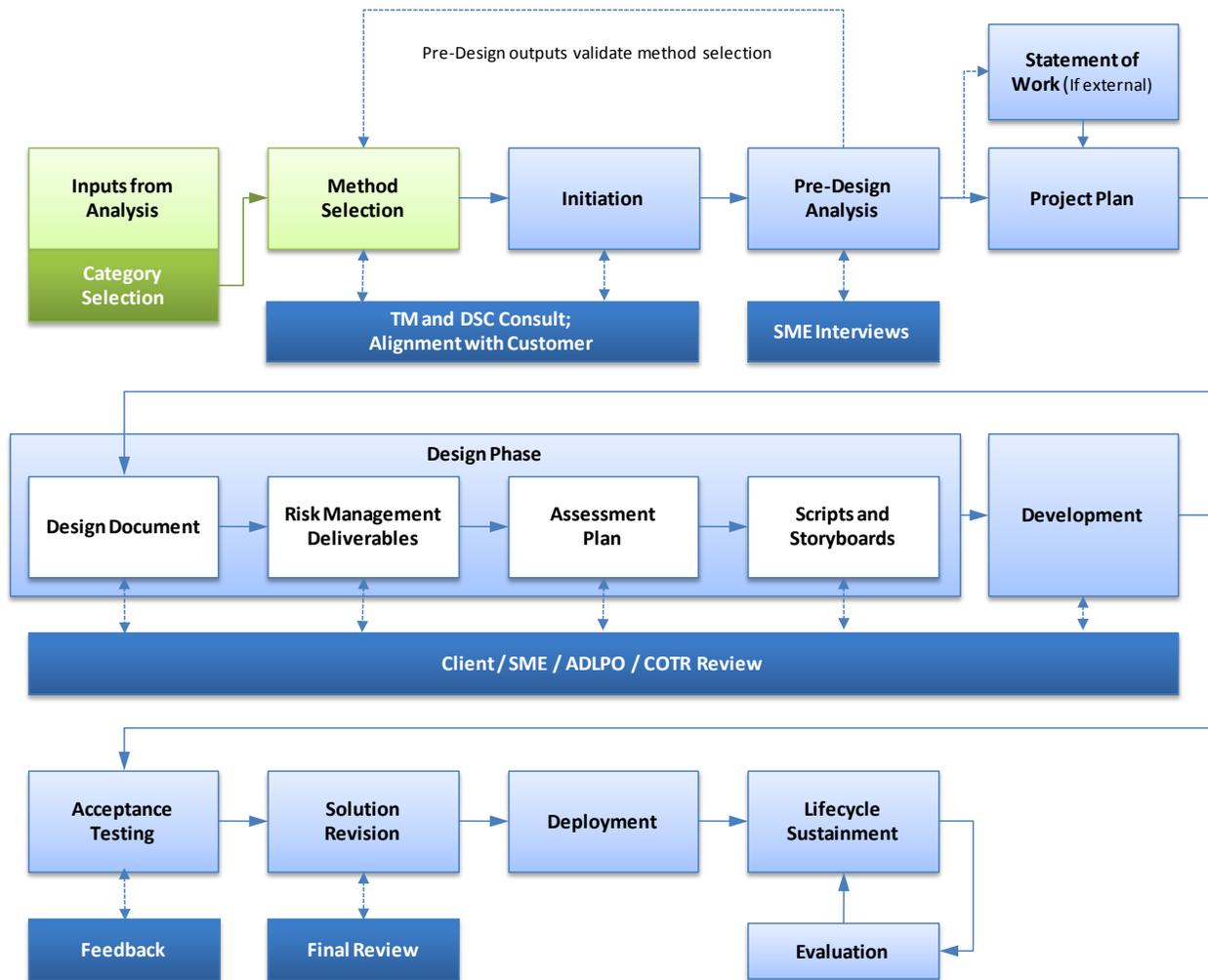
What forms are needed to manage the development of an ADL solution?

- a) Scope and Alignment Agreement is between the customer and the ADL Project Officer (ADLPO) where the expectations for the project are shown including scope, expected deliverables and outputs.
- b) Plan of Action and Milestones (POAM) is part of project management and shows the customer what to expect at each phase of the project.
- c) Storyboards Approval (lesson flow and course flow) is a document where the customer signs off approving of the delivered storyboards for the ADL solution.
- d) Delivery Agreement is the signed document indicating that the customer is in receipt of the completed ADL solution.
- e) Course Deployment Form provides documentation needed to place self-paced eLearning onto the Coast Guard's Learning Management System (LMS).

Section IV of this appendix provides examples of each form type and Section V provides blank forms for duplication and use.

III. The ADL Solution Process

This chart illustrates the flow of an ADL solution through the phases of the process. A description of each phase follows the flowchart.



Solution Category Selection

Solution **category** selection is an output of the analysis or RTA phase. See Section II of this appendix for more information on solution category selection. The Performance Analyst will collaborate with a Digital Solutions Consultant (DSC) before developing recommendations for skills and knowledge gaps. This collaboration will lead to a determination of the best approach to deliver the solution. After the solution category selection has been made, the performance analyst will complete a cost comparison/cost benefit analysis in accordance with Training System SOP2: Analysis or a cost estimate for RTA. Recommendations from the analysis are inputs into the ADL solution process.

Solution Method Selection

Solution **method** selection, recommendation and estimation follow the category selection determined in the FEA or RTA. The analyst should team with a solution specialist to identify potential risks and benefits of a particular method in addition to calculating the costs for development and sustainment.

In some cases, analysis may recommend a performance solution that involves training a list of tasks but also includes the need for practice and feedback in order to reach mastery. This selection could identify a blended solution or use of multiple methods to present the information performers need and the practice to build a performer's confidence and capability. If multiple methods are identified, solution specialists should be enlisted for help identifying risk / benefit factors and costs. For example, for a blended solution that includes resident training, a resident training specialist should be part of the integrated consult team.

If the solution to close a performance gap is a blended solution that includes SPeL there are additional considerations. See the SPeL Appendix of this SOP for more detailed guidance. If needed for accurate cost estimations, method selection may include media selection decisions for specific media and interactivity features / expectations of the ADL solution. This is important since it precedes a SOW or PWS for projects to be contracted externally.

Additional requirements apply to Mandated Training (MT). Refer to Appendix E: Self-paced eLearning Standards Guide for more information.

See Section II of this appendix for more information on solution method selection.

Solution Initiation

The Program Manager or Project Sponsor makes contact with their program's Training Manager or the ADL office in FORCECOM. The Training Manager will enlist an appropriate performance consultant or Digital Solutions Consultant to determine next steps. Next steps may include completing a Request for Analysis (RFA) or a Rapid Task Analysis (RTA), depending upon the urgency of the problem and the program sponsor's confidence in their identification of the problem. See Section II of this appendix for a description of RTA.

The analysis or Rapid Task Analysis will conclude with a report/outbrief to the Program Manager or Project Sponsor and the Training Manager or performance consultant. When an ADL solution is to be pursued, project alignment will be scheduled.

Pre-Design Analysis

In pre-design analysis the designers and developers fully define the requirements for the ADL solution. During this phase, the outputs of the FEA or RTA are reviewed; the business goals to be addressed are confirmed; the target audience is defined; and any cognitive task data are reviewed. See Section II of this appendix for more information on pre-design analysis. Specific pre-design analysis guidance may also be found in solution specific appendices of this SOP.

The Pre-Design analysis validates the selected solution method(s) identified at the close of the FEA or RTA.

This phase also includes the development of a Project Plan and a Plan of Action and Milestones (POAM) for the ADL solution. If internal resources are insufficient to execute the solution within the program sponsor's timeline requirements, this phase may also result in the development of a Statement of Work (SOW) or Performance Work Statement (PWS) to support outsourcing (i.e. contracting) the project.

The SOW or PWS needed for external contracting of the ADL solution project is written as the final output of the Pre-Design Analysis phase.

It is imperative that the pre-design analysis and design document be completed BEFORE development of a SOW or PWS. The Coast Guard's requirements must be completely identified before issuing a request for contractor proposals.

The **Project Plan** is the direct result of the Pre-Design Analysis or Statement of Work. The Project Plan defines the people and process of the ADL solution project. It includes:

- Introduction with overview of the project
- Personnel roles/responsibilities starting with Project Manager/Team Lead
- Travel expected during the project
- Alignment and kick-off meeting outcomes
- Assumptions
- Development methodology
- Assessment methodology
- Quality technical writing and editing
- Programming Support
- Quality assurance process for deliverables
- Deliverables
- Milestones (POAM) and schedule
- ADL Solution evaluation strategy
- Progress and status reporting periods and methods

- References
- Government furnished resources and property (if contracted)
- Personnel qualifications (including resumes if contracted)

Design

The instructional or performance solution design is established in the Design phase. The form of the solution is defined and the promise and vision of the final product are formulated during this phase. During the Design phase the analysis and pre-design analysis data and relevant content are transformed into concise objectives. The instructional blueprint that results will direct the development of all training materials, tests, and support methods applied to the final solution. Examples of forms for managing ADL Solutions are provided later in this appendix.

The Design phase includes the following **required activities and associated deliverables**:

1. The **Design Document** provides a report to document validated assumptions of goals, objectives, instructional strategies, types of training materials, and evaluation methods.
 - a. A complete list of the tasks associated with the solution.
 - b. Training requirements and outcomes identified thru the Front-End or Rapid Task analysis and pre-design analysis are structured as goals and objectives.
 - c. Assumptions including instructional strategies, media selection, types of training materials, and evaluation methods are determined. This document defines assumptions that drive all components of the ADL Solution, including learning content, sequencing, and navigation.
 - d. If applicable, a pre-test to allow advanced learners to test out of basic information they already know.
2. **Risk Management Deliverables.** These required deliveries provide incremental risk control for both the customer and the solution provider.
 - a. The **Solution Concept** further elaborates the methods the solution will employ to meet the goals outlined in the Design Document. The Design Concept concisely articulates the promise and vision of the solution and may be delivered in written form and / or as a verbal presentation.
 - b. The **Solution Flow** can accompany the delivery of the Solution Concept or follow in a separate delivery. The Solution Flow defines and documents the projected structure of the solution and normally manifests as a flow diagram or series of flow diagrams.

- c. The **Interface Mock-up** provides a visual example of the look planned for the ADL solution. A mock-up may include examples of the navigation that will be in the deliverable. Customer and stakeholder feedback early in the project will provide agreement on this important element.
3. The **Assessment Plan** must be established before the solution flow and storyboards/planning documents are developed. Assessment and measurement items will be used to prove the efficacy of the solution in the testing phase. Test items may need to be revised if assumptions are changed during the review of the solution flow or storyboards.
4. **Scripts and storyboards** are written. The storyboard is the planning blueprint. This output details the mapping of content, reference, and activity for performance support or instructional strategies. Storyboards shall be written in a way that is easily reviewed by the customer. Technical details unnecessary to the articulation of the design for customer review should not be included.

Requirements for specific ADL solutions are defined in ADL SOP 7 Appendices:

- Appendix D: Technical Requirements
- Appendix E: SPeL Standards Guide
- Appendix F: EPSS Standards Guide

Service and consultation personnel active in the Design phase include:

- ADL Project Officer / COTR
- Digital Solutions Consultant
- Designers (ISD)
- Developers (Media Development).

More information on each of these roles can be found in Appendix A: Getting Started. Contract deliverables are approved by the Program Manager/Program Sponsor (customer and SME) and COTR.

Development

Design decisions are translated into outputs in the Development phase. Media elements are developed, audio is recorded, and the solution is assembled during this phase. The Development phase is initiated upon approval of all preceding deliveries including the Design Document, interface mock-up, test questions, and storyboards.

Many specialized activities happen within the development phase including activity design, visual design, and user experience design to support execution of the solution blueprint (i.e.

storyboards). Because the primary deliverables from this stage are finished product increments, this stage wasn't broken down in the chart above. The level of effort spent on development is on par with the level of effort required for design.

The first delivery in the Development phase is a prototype. The prototype elaborates the solution concept with a tangible and functional representation of design assumptions.

The Development phase includes:

- Prototype creation and delivery
- Development of content and all media elements
- Formative testing and evaluation to ensure development outputs align with solution goals and planning documents
- Packaging content assemblies
- QA and testing the solution.

Development of an instructional or performance solution presents risks to both the client and the service provider (i.e. development entity). To mitigate these risks, it is best for the service provider to build risk control increments into the delivery schedule. This provides opportunities for incremental adjustments throughout the development process rather than at the point of finished product delivery. Confirmation and validation of assumptions in small doses prevents large doses of scope creep or customer dissatisfaction.

Throughout the Development phase, increments of the solution will be reviewed and approved to assure a satisfactory end product and to avoid the time and costs of re-work. See acceptance testing and review below for risk control suggestions.

The deliverable from the Development phase is a complete ADL solution product, submitted for approval.

Personnel key to the Development phase include:

- ADL Project Officer/COTR
- Designers (ISD)
- Developers (Media Design)
- Customer/reviewers

More information on their roles can be found in Appendix A: Getting Started. Contract deliverables are approved by the Program Sponsor (customer and SME) and COTR.

Acceptance Testing

Acceptance testing takes multiple forms and phases. The flowchart below provides an incremental delivery recommendation that can both control risk and provide optimal use of customer review resources.

To reduce risks, increase quality, and minimize unnecessary effort, a “Rough, Polished, Final” iterative cycle is required for most deliverables. The chart below illustrates how this would work for the design flow.

Deliverable Example	
Rough Design Flow	Government will review Rough Design Flow and provide feedback. Understand that roughs may include questions for the reviewer / SME and may not be complete.
Polished Design Flow	Government will review Polished Design Flow and provide feedback.
Final Design Flow	Final Design Flow integrates feedback from polished review cycle. Final submissions will be repeated (up to 5 times) until accepted.

The methods used for risk control and review shall be agreed upon at the project kick-off and may be dictated in the performance work statement. Some deliverables may not require a rough delivery and some projects may not have the schedule or resources to accommodate this risk mitigation strategy.

A rough > polished > final delivery sequence shall be followed unless indicated:

- within a deliverable definition
- within the statement of work
- during the project alignment

One notable exception to this sequence requirement is the functional prototype. While prototype media elements may be delivered in a rough state for validation, the functional prototype shall be delivered in a polished state.

This expectation is not intended as a burdensome requirement and should not require additional resources to accommodate.

Final deliveries also require testing across three categories:

- **Technical Testing** evaluates solution compatibility with both USCG deployment systems (such as the LMS) and audience access resources as defined

in the Common Technical Requirements or specifically defined solution requirements.

- **User Testing** (including Accessibility Testing) validates the experience provided by the solution is sufficient. User Testing is particularly important when a solution presents a new pattern of assembly or navigation.
- **Efficacy Testing** validates that the solution design and packaging solve the problem as promised.

Deployment

The Deployment phase focuses on the details of ADL solution delivery. All ADL delivery systems are administered by the ADL Program Office in FORCECOM.

If the ADL solution is an online course, then content is published to the Learning Management System. A test LMS is available to content service providers to validate technical compliance and functionality. If you need to publish a trackable courseware component, contact the ADL Program Technical Lead.

If the ADL solution is an EPSS, content is published to the EPSS Repository. If you need to publish an EPSS component to the central repository, contact the Performance Technology Center.

Deployment is accomplished by system support personnel and may require an additional deployment request form.

Access and enrollment is part of the deployment process. Reference the table below for a list of systems and the access / enrollment requirements for each system.

System	Access	Enrollment Rules
CG LMS (Production) https://elearning.uscg.mil	Administration and loading functions limited to system administration personnel.	Enrollment limited to active duty, civilian, and contract personnel. All CG deployed ADL courses shall be taken using the CG LMS to ensure data tracking and accountability. Use of other digital methods for Mandated Training course completion is prohibited for active duty, civilian, and contract personnel. NAF employee access available via alternate means. See the SPeL Appendix for more information.

CG LMS (Development) http://elearn.uscg.mil	Administration access for course loading granted to internal and external developers on a case-by-case basis. Contact the ADL IT Lead for access.	Enrollment limited to testing personnel. Tracking data not retained. See the SPeL Appendix for more information.
EPSS Repository http://epss.uscg.mil	Administration and loading functions limited to system administration personnel.	No enrollment necessary. Users must access the system from a CG SWIII. See the EPSS Appendix for more information.
SkillSoft Courses	Administrative access not available.	Course enrollment is accessed via single sign-on through CG Portal, "Training & Education" tab.

Evaluation

The purpose of evaluation is to ensure that the ADL solution is effective, efficient and continues to address the business goals. Decisions about revisions for future course iterations can be made after evaluating the strengths and weaknesses of the ADL solution post deployment. The ultimate goal of evaluation is to ensure that the ADL solution improves performance in the field.

While formative evaluation is part of the design and development process, summative evaluation reviews the solution after it has been implemented. It measures outcomes in terms of learner's opinions about the product, test results and the learners' job performance after the ADL solution.

Dynamic feedback loops are very important in the instructional design cycle. Evaluation of the ADL solution feeds back into the process with help from the Training Manager, Project Manager and Solution Lifecycle Manager who maintain the pulse of the solution's effectiveness, relevance and content viability. Each ADL solution will have an established review cycle; at strategic points within the sustainment phase, the solution's evaluation information will be consolidated and reviewed with the following determinations being made:

- If the performance need still exists, then the content viability is reviewed. If the content is deemed relevant and viable, then the course is left alone and the review cycle is reset.
- If the performance need still exists, then the content viability is reviewed. If content is deemed out of date or incorrect, then the course is put into the "Solution Revision" phase. Once it is revised and again relevant and viable, then the solution re-enters sustainment phase.
- If the performance need no longer exists, then the course is prepared for disposition (i.e. the course is cataloged into a "cold storage" element) and removed from the servicing infrastructure.

IV. Common Activities and Outputs Checklist

In the above descriptions of the phases in the ADL Solution process, the common activities and outputs were identified. This checklist focuses on each activity and output requirement.

Phase	Activities
Category Selection	<ul style="list-style-type: none"> <input type="checkbox"/> Category selection made through collaboration with digital solutions consultant. <input type="checkbox"/> Category selection precedes the cost estimation and cost-benefit analysis.
Method Selection	<ul style="list-style-type: none"> <input type="checkbox"/> Pre-design analysis complete. <input type="checkbox"/> Method selected or validated by DSC. <input type="checkbox"/> Statement of Work or Performance Work Statement produced if solution is to be externally contracted.
Solution Initiation	<ul style="list-style-type: none"> <input type="checkbox"/> Official solution request received from Program Manager/Sponsor or Training Manager. <input type="checkbox"/> Performance analysis data reviewed or Rapid Task Analysis conducted. <input type="checkbox"/> DSC recommended / validated solution method.
Pre-design Analysis	<ul style="list-style-type: none"> <input type="checkbox"/> Scope of the effort defined. <input type="checkbox"/> Target audience defined. <input type="checkbox"/> Primary stakeholders and SMEs identified. <input type="checkbox"/> Current analysis and task data reviewed. <input type="checkbox"/> Business goals documented. <input type="checkbox"/> In absence of performance analysis, execute a Rapid Task Analysis. <input type="checkbox"/> Task level data collected. <input type="checkbox"/> Cognitive tasks identified (if digital training or orientation components are part of the solution). <input type="checkbox"/> Methods for the ADL solution selected and validated. <input type="checkbox"/> Customer alignment meeting conducted. <input type="checkbox"/> Kick-off Meeting (if externally contracted) <input type="checkbox"/> Alignment Agreement signed. <input type="checkbox"/> Project Plan produced.

Phase	Activities
Design	<input type="checkbox"/> Solution concept completed. <input type="checkbox"/> Design Document produced. <input type="checkbox"/> Draft Curriculum Outline. <input type="checkbox"/> Test Questions / Assessment Methods established. <input type="checkbox"/> Solution Flow produced. <input type="checkbox"/> Prototype produced. <input type="checkbox"/> Scripts and Storyboards produced. (Rough, Polished, Final)
Development	<input type="checkbox"/> Solution produced. (Rough, Polished) <input type="checkbox"/> Solution QA completed. <input type="checkbox"/> Solution revisions reviewed. <input type="checkbox"/> Final solution delivered. <input type="checkbox"/> Source materials delivered / reviewed after testing.
Acceptance Testing	<input type="checkbox"/> Technical / Compatibility Testing completed. <input type="checkbox"/> User Testing completed (if required). <input type="checkbox"/> Efficacy Testing completed.
Deployment	<input type="checkbox"/> Solution deployed.
Evaluation	<input type="checkbox"/> Evaluation plan complete.
Lifecycle Sustainment	<input type="checkbox"/> Delivery acceptance documents signed. <input type="checkbox"/> Project archived. <input type="checkbox"/> Sustainment plan complete.

V. Examples of Forms for Managing ADL Solutions



Collateral Duty XXXXXXXXX Coordinator (XC) EPSS and Course Development Scope & Alignment Agreement

Project Title	Insert Project Title Here
Alignment Meeting Date	11 November 2010
Attendees	"Put list of attendees at alignment meeting here"
Program Goals for This Project	Create e-learning course and EPSS to support collateral duty XXXXXXXXX Coordinators to include the compliance categories.
Product Description	<p>PTC Design and Development team will design and develop an e-learning course that familiarizes learners with the general principles and federal and state laws regarding the standard compliance categories. It will introduce the learners to the different XXXXXX laws and regulations, but will focus on an awareness of process, compliance, and management. The course will also introduce the learner to tools that are available to support their performance of these tasks.</p> <p>The EPSS will be developed to provide direct support to XXXXXX coordinators at their units.</p>
Format	eLearning course on LMS, CD, and EPSS hosted on epss.uscg.mil
Scope	<p>Media type: CD Seat Time: TBD Hosted: Course hosted on learning portal. EPSS hosted on epss.uscg.mil and on CD Graphics: Yes Interactivity: Yes # of Screens: TBD # of Questions: TBD</p>
Development Tools	PTC development tools including Robohelp® and Articulate® will be used.
Media Resources	Photo, Video, 3D modeling
Target Audience	Coast Guard personnel who are assigned the collateral duty of XXXXXXXXX Coordinator.

Primary subject matter expert (SME)	Jim Expert
Client Responsibilities	This will be a team effort. The Client will stay engaged throughout the development process; granting approval at specific points as designated by the POAM. Client is also responsible for providing engaged and accessible SME.
Project Completion Date	31 May 2010
Official Authorized to sign off for Completion	Edward Wander
Funding	Funded by CG-XX

Project Roles

Organization	Name	Role
(Insert Development Entity)	LT XXXXXXXXX	Project Officer
(Insert Development Entity)	Mr/Ms. XXXXXXXX	Team Lead/Designer
FC-Tms or Tot	LCDR XXXXXXXX	Training Manager
(Insert Client Designator)	Edward Wander	Client/Program Manager
SFLC	SILC (XXXX and staff)	Subject Matter Expert (SME)

SUBMITTED: _____
DATE _____ XXXXXXXXX,
(Development Entity) Team Lead

REVIEWED: _____
DATE _____ LCDR XXXXXXXXXXXX,
(Development Entity) Branch Chief

APPROVED: _____
DATE _____ CDR X.X. XXXXX
Director, (Development Entity)

APPROVED: _____
DATE LCDR XXXXXXXX, (FC-Tms or Tot)
FORCECOM Training Manager

VALIDATED: _____
DATE Edward Wander, (CG-XX)
Program Manager/Client

- Attachments: (1) Plan of Action and Milestones-EPSS
(2) Plan of Action and Milestones-
Course
(3) Cost Estimate

Collateral Duty XXXXXXXXXXXXXXXX Coordinator (XC) E-Learning Course

Plan of Action and Milestones (POA&M)

#	Milestone	Start	End	Status	POC	Comments
1	Alignment Agreement approved	21 Dec 10	21 Dec 10	50%	XXXXXX	
2	EPSS Design Doc Development	13 Dec 10	14 Dec 10	100%	XXXXXX	
3	Preliminary Research	13 Dec 10	23 Dec 10	0%	XXXXXX	
4	Draft Instructional Design	28 Dec 10	21 Jan 11	0%	XXXXXX	Output is rough storyboards
5	Present Instructional Design proposal		21 Jan 11	0%	XXXX	
6	Revise Instructional Design based on feedback	24 Jan 11	28 Jan 11	0%	XXXXXX	
7	Product Design Document Approved		28 Jan 11	0%	XXXXXXXX	Based on ID proposal
8	Develop Content Flow and Storyboards	31 Jan 11	15 Apr 11	0%	XXXXXXXX	
9	Content Flow/SB approved by LCDR XXXXXXXX		22 Apr 11	0%	XXXXXXXX	
10	Content Flow/SB approved by Program		25 Apr 11	0%	XXXXXX	
11	Produce Functional Product	25 Apr 11	6 May 11	0%	XXXXXXXX	
12	Conduct Internal Review	9 May 11	13 May 11	0%	XXXX	
13	Program Review of Product	16 May 11	20 May 11	0%	XXXXXX	
14	Revise based on Internal and Program Review	23 May 11	25 May 11	0%	XXXXXX	
15	Conduct User Test/Compile Report	25 May 11	27 May 11	0%	XXXXXXXX	
16	Revise based on UserTest	27 May 11	30 May 11	0%	XXXXXXXX	
17	Deliver Product		31 May 11	0%	XXXXXXXX X	
18	Delivery Agreement Signed		31 May 11	0%	XXXXXXXX	

ADL Project Design Document Checklist

An ADL Project Design Document shall include:

- Learner population (experience, background, qualifications, expectations, learning styles)
- Desired performance associated with ADL solution
- Validated task list
- Objectives (terminal, enabling) for the course or ADL solution
- Instructional approach (e.g., length, module descriptions and sequence, practice strategy, feedback strategies, testing strategy, drills, scenario-based exercises, simulations, role-plays, games)
- Confirmation of cost associated with the strategy
- Completed matrix for each module (example below)

Module name and number			
Enabling objectives	Content for each EO	Index number of Tasks (from the analysis) supported by this EO	Sample test item
1.			
2.			

- Project Plan including Plan of Action and Milestones (POAM) with tasks and dates, including review dates for deliverables
- Rough, Polished, Final testing plans
- Sources used to prepare the Design Document
- Signature blocks for ADLPO and Program Sponsor

In addition, the ADL Project Design Document may include:

- Number and types of screens
- Number and types of graphics, Flash animations, self-tests, etc.
- Browser requirements and constraints
- Software requirements
- Display requirements (resolution, size, etc.)
- Learner interface (e.g., mouse, touch-screen)
- Navigation and branching
- Quick tips
- Job aids
- Rollovers



Design Document

Learner Population

This mandated training is required for all newly hired Coast Guard civilian employees.

This ADL training package can be accessed by any computer with an internet connection including all Coast Guard WSIII computers.

The majority of users have experienced educational products in the on-line environment and should have no problem with the technology. Technical assistance is available if needed.

Objectives

Terminal Performance Objectives (TPO)

- 1.0 Given employment in the Coast Guard, IDENTIFY the Coast Guard's history, missions, organization, and personnel, 100% of the time.
- 2.0 Given employment in the Coast Guard, IDENTIFY civilian personnel resources, 100% of the time.
- 3.0 Given employment in the Coast Guard, UTILIZE career development resources, 100% of the time.

Enabling Performance Objectives (EPO)

- 1.1 RECALL basic Coast Guard history
- 1.2 IDENTIFY Coast Guard missions and core values
- 1.3 DESCRIBE the basic organization of the Coast Guard
- 1.4 RECOGNIZE Coast Guard personnel, including ranks and rates
- 2.1 LOCATE appropriate online resources associated with civilian pay, benefits, and employment
- 2.2 RECOGNIZE Work-Life resources as well as Coast Guard policy on diversity
- 2.3 OPERATE Coast Guard directive system
- 2.4 OPERATE Coast Guard Message System (CGMS)
- 3.1 RECOGNIZE Coast Guard leadership competencies relevant to the learner's job
- 3.2 RECOGNIZE the processes used in the Excellence, Achievement, and Recognition System (EARS)

3.3 IDENTIFY available professional development resources
3.4 IDENTIFY available mentoring resources

*These TPO's and EPO's may change slightly following the approval of the Curriculum Outline

Instructional approach to be used for the course

This course will provide basic NEED TO KNOW information so as to be respectful of the learner's time as well as ensure meaning and relevance. Additional links and resources will be available, but their access will not be a completion requirement.

This ADL product will be activity based. These activities will focus on the learning objectives and will provide the opportunity for the user to navigate and operate CG civilian personnel resources.

This course recognizes that the learner may find themselves in one of the following three situations:

- (1) as someone who is unfamiliar with Coast Guard organizational characteristics and customs;
- (2) as someone who needs access to job-management and communication tools; or
- (3) as someone who needs access to resources that will help them develop their career.

The course will also be packaged as a reference tool and will be hosted at a location yet to be determined.

MT Constraints

In accordance with COMDTNOTE 1550, to reduce the training burden on units and individuals, this training will be delivered as e-learning.

A printable version will allow an alternative to the on-line experience for those who prefer that medium. However, the user must return to the on-line version to complete the sections and have completion recorded in the learning management system, training management tool, and transmitted to Coast Guard Business Intelligence.

Cost

Insert appropriate cost information in this section to include, but not limited to: 1) Who is responsible for initial funding?, 2) Who is

responsible for coordination of future sustainment funding?

Project Plan

Project milestones and review dates were included in the POAM as an attachment to the original alignment agreement.

Acceptance Testing Plan

Following an internal review (Rough Test) and Client review of functional product, a Polished/Finished Test will be conducted to evaluate usability and content of the course.

The Polished and Finished tests will consist of the observation of 30 learners as they take online course and reaction survey.

The results will be compiled into a final report and used to make improvements in content and usability.

SUBMITTED:

DATE

Ms. XXXXXX, ADL Team Lead

REVIEWED:

DATE

LT XXXXXXXX, ADL Project Officer

APPROVED:

DATE

Ms. XXXXXX, CG-1XX, Client POC



Content Flow Approval Document

Reference: (a) [CG Training System Volume 7 Standard Operating Procedure, Advanced Distributed Learning](#)

Purpose: The purpose of this document is to seek continual alignment, buy-in and support of the respective program office(s) identified during initial alignment of the ADL asset development effort.

Action: Attached is the proposed content flow for the Mandated Training course “Civilian Orientation”. As per reference (a), person(s) identified as program managers shall review the attached content flow document and sign below signifying acceptance of the proposed content flow. If there are any issues, irregularities, questions or concerns with the proposed content flow document seek guidance/clarification through the below listed ADL Project Officer. Upon approval, the ADL Development Team will proceed with the creation of the final online product.

SUBMITTED:

DATE _____
LT X.X. XXXXXXXX,
ADL PROJECT OFFICER

APPROVED:

DATE _____
MS X.X. XXXXXX,
PROGRAM MANAGER POC (CG-XXX)

Sample ADL Discrepancy Report

Project Name: ADL Project XXX Feedback and Discrepancy report

(Note: If ADL project is externally contracted, include Task Order Number)

Submission Date: August 4, 2011

Submitted by: USCG FORCECOM Performance Technology Center

This report documents feedback and discrepancies noted during the final review of the ADL project by both the Instructional Systems Designer (ISD) and the customer, CG-XXX

Total Number of Change Requests Received: 203

Total Number of Change Requests Completed: 194

Sample ADL Discrepancy Report, continued

Comment	Location	Issue Type	Media Type	Status
Descriptive Text	Lesson, Module, Topic, Screen	Bug, Content, Functionality, ISD	Navigation, Text, Animation, Audio	Completed, Exercise Completed, Pending
1. Audio missing	Lesson 01, Module— Introduction, Screen 4 of 5	Bug	Audio	Completed
2. Too much information on one screen; split into two screens	Lesson 01, Module— Hull and Deck, Screen 17 of 32	Content	Screen and Text	Assigned and pending
3. Make items in text bulleted	Lesson 02, Module-- BECCE	Content	Text	Completed
4.				
5.				
6.				
7.				
8.				
9.				
10.				



Advanced Distributed Learning (ADL) Asset Delivery Agreement

Project Title Mandated Training – Civilian Orientation

Project Duration 5/6/2010 to 10/18/2010

Original Request Provide basic information to all new civilian employees about the Coast Guard as an organization, civilian job resources, and professional development.

Project Description Create an ADL product that meets FORCECOM MT requirements. Create a curriculum outline.

Product Description The purpose of this course is to provide basic NEED TO KNOW information to all new civilian employees about the Coast Guard as an organization, civilian job resources, and professional development. This performance-based course is designed to be extremely focused on what the learner NEEDS TO KNOW about this topic so as to be respectful of the learner’s time as well as ensure meaning and relevance. This course relies heavily on externally available internet and intranet content and applications in order to leverage preexisting media and information already produced.

Delivery/Format Course is web-based and optimized for 128kbs delivery. Course will be tracked via TMT/CGBI and also packaged as a reference tool.

Program POC Ms. Darlene Murphy, CG-133, 202.475.5520

Total Funding Initial Funding coordinated by FC-51.

Maintenance Responsibilities Maintenance costs shall be funded by program.

Return on Investment ROI calculation not requested by client.

27 OCT 10
Date

LT Allison Middleton
Project Officer, PTC D&D

29 OCT 10
Date

LCDR Steven Ramassini
Branch Chief, PTC D&D

8 NOV 2010
Date

CDR Aaron Waters,
FC-515 ADL Program Manager/MT Manager

9 NOV 2010
Date

Ms. Darlene Murphy
CG-133, Client

USCG Training System SOP 7 Appendix D

Common Technical Requirements

I. Appendix Overview

This appendix extends Training System SOP 7 (ADL) to define common technical requirements (requirements, prohibitions, allowances) for any digital solution serving performance support and training purposes. More specific solution standards that extend these requirements can be found in the specific appendix dealing with a category of product (EPSS, SPeL, etc.)

For more information on how solutions are selected and general process for approaching ADL solution providers see **Appendix A: Getting Started**.

Unless noted, requirements established in this SOP can be waived by the ADL Program Manager. Those seeking a waiver should submit a business case and specific requirements to the ADL IT Lead through your designated ADL Project Officer (ADLPO)/Contracting Officer's Technical Representative (COTR) for approval.

The requirements listed in this appendix are organized by Deployment Specifications, Delivery and Distribution Requirements, and Tool and Practice Requirements. All technical requirements listed are equally important.

Checklists or delivery requirements for specific delivery types (EPSS, Self-Paced eLearning) will be provided in the specific appendix referenced for the delivery type or provided by the ADLPO.

II. Deployment Specifications

This section addresses Coast Guard Workstation specific hardware and software deployment specifications and requirements associated with the deployment of digital performance support and training solutions.

Deployment Requirements - Primary Configuration

CGADL-D-001: Technology based solutions **shall** operate as designed on hardware that meets the specifications defined in *USCG FORCECOM Training SOP 7 Appendix D, Common Technical Requirements*.

CGADL-D-002: Minimum hardware requirements **shall** be clearly displayed for the user if their hardware configuration is deficient.

Well architected solutions will:

- Detect and advise the user of hardware configuration deficiencies
- Adjust the presentation to accommodate hardware limitations
- Provide a seamless user experience and present assistance if delivery is impeded.

Workstation Minimum Hardware Specifications

Standard workstations should meet the specifications below.

Processor	Intel 2GHz or better
Operating System	Microsoft Vista 32-bit
Memory	2G
GPU	DirectX10 capable GPU with 256M of Video Memory
Display	1024x768 or better
Sound	Sound card supported
Optical	CD-ROM or DVD-ROM supported
Network	Shared high speed network connection. Deployed units may have restricted or zero connectivity. <i>Workstations connected to SIPRNet will not have access to resources outside of the classified network.</i>

CGADL-D-003: ADL solution providers **shall** develop technology and content that will operate with the primary software configuration defined in *USCG FORCECOM Training SOP 7 Appendix D, Common Technical Requirements*.

Workstation Software Specifications

Standard workstations should meet the specifications below.

Browser	Internet Explorer 7.006.2
Browser Plug-ins (as of 07APR2011)	Adobe Flash Player 10,1,102,64
	Adobe Shockwave / Director Player 11.5.9r615 (10.1.0.11 on SIPRNet) (see CGADL-D-004)
	Microsoft Silverlight 4.0.60129.0 (version 3 on SIPRNet) (see CGADL-D-004)
	Macromedia Authorware 2004,0,0,73 (see CGADL-D-004)
	nGrain Player is not part of the standard workstation image but may be available on some workstations. (see CGADL-D-004)
Java Applets	Java applets will only function within the trusted zone (intranet). Java applets outside the trusted zone will fail to load.
Viewers	Microsoft Visio Viewer
	Adobe Acrobat 8 Standard 8.2.5 (8.1.7 on SIPRNet)
	DWG TrueView 2008 Viewer (DWF, DWG)

CGADL-D-004: Deliveries that include Shockwave Director, Authorware, NGrain and Microsoft Silverlight format files will not be approved for delivery without permission in writing from the ADL program office. Submit written requests through the ADLPO/COTR. *Shockwave Director, Authorware, and Silverlight files are supported on the CG Standard Workstation but are not preferred. Although approved for use, nGrain is not installed on all workstations.*

CGADL-D-005: Technology solutions **shall not** require installation to a workstation to function. ActiveX controls and software updates are prohibited.

CGADL-D-006: The solution **shall** detect and advise the user of software configuration deficiencies. Minimum software requirements must be clearly stated to the user if their software configuration is not sufficient.

CGADL-D-007: Solutions destined for server side deployment to the LMS, epss.uscg.mil, or the virtual classroom **shall not** include dynamic file types (ASP, PHP).

Deployment Requirements – Alternate Software Configurations

CGADL-D-008: ADL solution providers **shall** develop technology and content that operates on the alternate software configurations defined in *USCG FORCECOM Training SOP 7 Appendix D, Common Technical Requirements*.

The Coast Guard ADL Program serves many audiences, including the CG Auxiliary and users of the SIPRNet training network. To ensure these audiences are well served, the following alternate software configurations should be tested with each solution to ensure compatibility. Problems with this testing must be reported to the ADLPO/COTR. **Alternate Software Configurations including SIPRNet**
Solutions shall support the alternate software configurations listed below.

Internet Explorer 8.0	Support on these configurations should be with similar plug-in and viewer configurations listed in the Workstation Software Specifications table. <i>(See CGADL-D-006)</i> <i>When possible, developers should attempt to maximize compatibility with all platforms and browsers including portable devices.</i>
Internet Explorer 9.0	
Firefox 3.6.8 (SIPRnet requirement)	
Firefox 4.0 (compatibility)	
Microsoft Windows 7 (32 and 64-bit)	

** Other browser configurations are not supported.*

III. Delivery Requirements, Distribution Approval and Governance

This section addresses delivery and approval requirements. Additional requirements may apply to specific types of deliveries (EPSS, SPeL, etc.)

CGADL-D-009: Solution providers **shall** complete delivery and testing checklists listed in the product testing section for each specific product appendix or as requested / provided by the ADLPO or COTR. Logs of completion **must** accompany final deliveries for any integration testing.

CGADL-D-010: Solutions **shall** be tested for operation both in a client deployed (local / CD-ROM) configuration and a server deployed configuration (LMS, virtual classroom, epss.uscg.mil, internet or CGPortal) for any product intended for centralized distribution.

CGADL-D-011: All deliveries including incremental tests, integration tests, and final delivery packages **shall** be routed through the ADLPO designated for the project.

CGADL-D-012: All source materials used to build the solution **shall** be delivered with the final accepted version of the solution. *See the specific product appendices for package delivery models and structures.*

CGADL-D-013: Source materials for 3D models and animations **shall** accompany any delivery including derivatives or outputs of these models. Separate animation files **shall** be included for individual animations. Common compatibility files (FBX or Collada) **shall** also be included in addition to the source format for model source deliveries.

CGADL-D-014: Materials and solutions **shall** comply with Section 508 (29 U.S.C. 794d) to provide comparable experiences and access to all users.

Waivers for 508 Compliance should be routed through the ADLPO/COTR. Approval comes from Department of Homeland Security. ADLPOs/COTRs should assess the practicality of a waiver prior to sending to the ADL Program. Granting of waivers for any purpose will be rare.

IV. Tools and Practice Requirements

This section addresses tool and practice requirements. Additional requirements may apply to specific types of deliveries (EPSS, SPeL, etc..)

Development Considerations

Code

Code describes high-level programming languages, scripting, and markup languages. The following considerations apply to Self-Paced eLearning code development:

- When possible, use a documented code library or framework (i.e., JQuery).
- Name methods and functions logically
- Make code easy to locate. For example, don't bury code in multiple Flash movie clips. In this case, code on the main timeline or in external class files is more manageable.
- Use language versions appropriate to the final deployed version. For example, custom Flash components for inclusion into Articulate® version 9 must be AS2.0.
- Document the code details including packaging version in the packaging report.
- Comment code often to facilitate later revisions by different developers.
- Use white space to make code easier to read.

Graphics

Acquisition and treatment of graphic elements is critical to a quality optimized product. Improper preparation of visual elements can impact performance, distract the learner, and create accessibility problems. The following rules of thumb apply:

- Use the most appropriate file type to the application. When in doubt, provide PNG format images.
- Scale bitmap images to the target size before importing into the authoring environment. Images shall not be scaled in the authoring environment unless scaling is a requirement of the illustration or interaction.

<p>Animation</p>	<p>The use of animation should be restricted to instances where animation is beneficial to learning or attention. Unnecessary transitions should be avoided (fly in, bounce in, etc.) Animation pacing is a critical but difficult concept to master.</p> <p>As a rule of thumb:</p> <ul style="list-style-type: none"> • Slow creeping animations should be avoided. Appearance transitions should be snappy (~1/2 second). • Pacing of animation should match the supporting audio.
<p>Video</p>	<p>Video should be optimized for distance delivery and should use consistent dimensions throughout a course.</p> <p>Audio used within a video component shall be of consistent quality and volume to audio used throughout the product.</p>
<p>Audio</p>	<p>Narration samples shall be provided for approval prior to recording narration. Professional narrators shall be used for narration except in cases where a subject matter expert provides an authentic explanation suitable for inclusion for instructional support. In most cases, in-house narration by inexperienced voice actors will not be acceptable.</p> <p>Audio shall be of consistent quality and volume throughout the product.</p>

CGADL-D-015: Off-the-shelf or government owned tools **shall** be used to develop or package solutions. Proprietary toolsets **shall not** be used to develop technology solutions.

Internal Tool Standards

The tools below are commonly used by internal development resources. Additional tools may be used within the organization for special purposes.

Adobe Creative Suite 4	Media and web application development
Adobe Robohelp 8	Help authoring
Lectora X	SPeL assembly
Articulate Studio '09	SPeL assembly
Autodesk 3DS Max 2011	3D Modeling / Animation (complex)
Google Sketchup	3D Modeling / Illustration (simple)
Microsoft Office 2007	Communication, documentation and support materials
Inquisiq R3	Learning Management System

Tools listed above are prescribed for internal efficiencies and compatibility. These tools are not endorsed by the U.S. Coast Guard.

CGADL-D-016: If a tool is defined as a requirement in the Statement of Work, this tool **shall** be used to develop the delivered solution.

CGADL-D-017: Developers **shall** build code assemblies that efficiently place shared elements into mechanisms like style sheets and common javascript files.

CGADL-D-018: Developers **shall** add comments to custom code elements to support reasonable maintenance of custom code.

CGADL-D-019: Linked elements must be contained within the content package. Links from a solution to a location outside the Coast Guard Data Network are prohibited.

To minimize maintenance requirements and mitigate the effects of dead links, linked materials should be included within the content package whenever practical.

CGADL-D-020: Content delivery of media **must** be efficient. Content packages **shall not** be compiled into a single large file. File sizes should be reasonable for web delivery to the target audience. *The file parameters table below describes recommended file sizes and acceptable / unacceptable file types.*

Preferred File Formats, Sizes, Considerations

File sizes shall be reasonable (CGADL-D-020)

Purpose	Format	Version	Size	Considerations
Packaging	.html	4		Abstract common elements and functions into .css and .js files.
Complex Interactions	.swf	10	~500Kb	Take care to use Flash only for necessary functions, leveraging tagged html and less complex assemblies wherever possible.
Video	.flv or .mp4		~ 2Mb	Video player must support captioning for accessibility. Rule of thumb: video files should be no larger than 2Mb. Short video lengths (15 – 45 seconds) help to control file size and provide chunking for attention and relevance.

Preferred File Formats, Sizes, Considerations

File sizes shall be reasonable (CGADL-D-019)

Purpose	Format	Version	Size	Considerations
Audio	.swf or .mp3		~ 500Kb	.wav, .mov, and .rm files are prohibited. Audio must play on the standard workstation from within the browser. Rule of thumb: audio files should be no larger than 500Kb. Short audio lengths (15 – 45 seconds) help to control file size and provide chunking for attention and relevance.

				<i>Audio and video should generally not start without user interaction. This prevents problems with screen readers beginning to read screen elements while the audio track plays.</i>
Print	.pdf	8		PDF files must be processed for accessibility compliance. Screen magnifiers may have problems displaying PDFs at some zoom levels. Set default zoom view to 100% to minimize artifact display.

CGADL-D-021: Large files **shall** show an incremental loading indicator while loading.

This means any large file that doesn't provide direct feedback via the web browser's status bar must provide a loading indicator that informs the user how much of the file has loaded and how much of the file has yet to load.

CGADL-D-022: Licensed or copyrighted media elements **shall** be listed on a media inventory.

A media element list for licensed or copyrighted media should consist of these fields:

- Name of the file
- Description of the file
- Source of the file
- Licensing terms / reference to licensing terms

Appendix E: SPeL STANDARDS GUIDE

USCG Training System SOP 7 Appendix E

Self-Paced eLearning Standards Guide

I. Appendix Overview

This appendix extends Training System SOP 7 (ADL) with standards and process requirements for Self-Paced eLearning (SPeL).

Processes, forms, and requirements in this appendix will be followed for Self-Paced eLearning solutions unless otherwise noted.

Introduction

The analysis, selection, design, development, implementation, evaluation and lifecycle maintenance/sustainment of Self-Paced eLearning solutions are guided by the Coast Guard's Human Performance Technology (HPT) approach to solving performance problems or producing new performance. Inputs from analysis needed for effective Self-Paced eLearning solutions include:

- Job and major accomplishments
- Tasks producing the required performance
- Cognitive task factors that contribute to successful skill performance

Collection of performance and cognitive task data using approved Coast Guard & HPT methodologies will provide the basis for Self-Paced eLearning solutions, resulting in more focused and measurable objectives and more relevant and valuable practice. Self-Paced eLearning is more than a convenient channel for communicating information. This solution method is an opportunity to build meaningful skills.

What is the intended audience for this appendix?

Self-Paced eLearning solutions can be complicated to design, develop, and manage. This appendix is designed to help program managers, training managers, training support personnel, and contract service providers by supplying a process framework and a series of models to align expectations.

This appendix was constructed based largely on the input of our internal development community. This community includes ADL project officers, media developers, instructional specialists, and contracting specialists. The guide can only get better with your input. Forward your comments, questions, corrections, or suggestions to ADLSOP@uscg.mil.

Since the appendix has been written with many roles in mind, it may be challenging to find a starting point. Use the grid below to find the role that matches you the most closely for a guide recommendation.

<p>New to eLearning</p> <p>If you're new to eLearning your interests may vary. The first sections (II – IV) provide a definition and high level overview of the process used to select, initiate, and plan a Self-Paced eLearning solution.</p>	<p>Contract Service Provider</p> <p>Contract service providers will be most interested in the deliverable requirements. USCG requirements likely differ from those of other customers. Familiarize yourself with the process. Then review the design section (VII), development section (X), and acceptance testing section (XI) closely. These sections reference other appendices in this SOP.</p>
<p>Program Manager</p> <p>As a Program Manager you're probably interested in getting a project moving. The first few sections (II-IV) provide a definition and high level overview of the process. Section V covers the initiation process. You may want to begin by contacting your Training Manager for a consult. Digital Solution Consultants can be referred either through the ADL Program Office or the Performance Technology Center.</p>	<p>Instructional or Multimedia Designer /Developer</p> <p>Design professionals should be familiar with all facets of the ADL SOP but will follow the design philosophy and design process deliverables sections closely. Developers may be most interested in the technical delivery requirements for the solution as well as the acceptance testing requirements. Development guidance can be found in section X. Acceptance testing is located in section XI.</p>
<p>ADL Project Officer</p> <p>The ADL Project Officer is the project controller / manager for the entire project cycle. The ADLPO ensures that project deliverable requirements are met, shepherding the project alignments and review cycles through to the successful conclusion of the project. The ADLPO should print the ADLPO Checklist and be familiar with all facets of the ADL SOP.</p>	<p>Solution Lifecycle Manager</p> <p>The Solution Lifecycle Manager is selected to provide services over the lifecycle of the solution. The SLM should also be familiar with all facets of the ADL SOP.</p>

II. Definition of Self-Paced eLearning

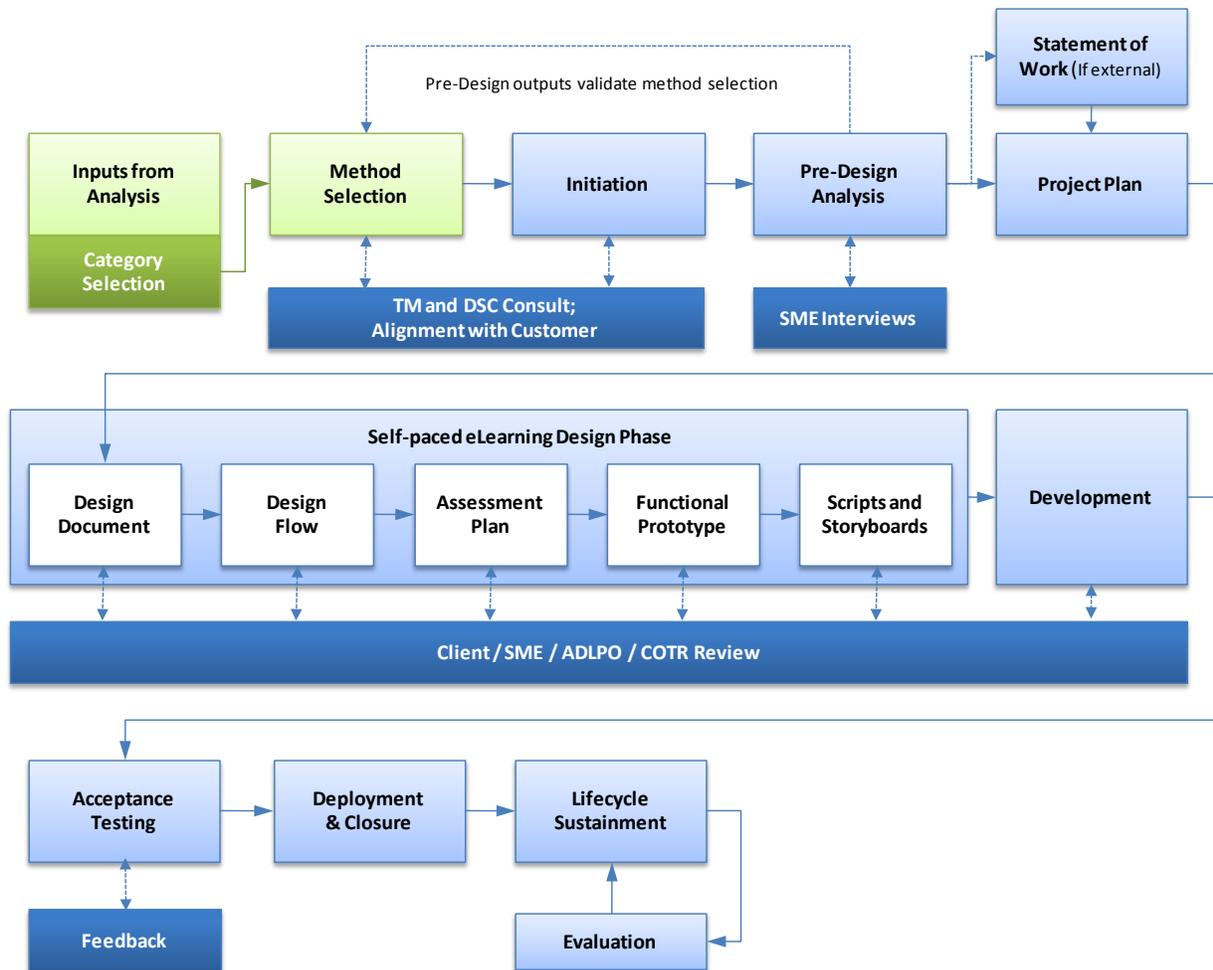
What is Self-Paced eLearning?

Self-Paced eLearning is defined as instruction that leverages technology to deliver learning solutions that support Coast Guard mission requirements and are accessible anytime, anywhere. It is based on three fundamental criteria:

1. Solutions are distributable over a network to ease maintenance updates and tracked to provide decision support and accountability.
2. It is delivered to the end-user, on demand and at their convenience, via a computer using technology appropriate to the user's environment.
3. It focuses on supporting a measurable change in behavior or attitude that provides tangible benefits to the mission.

Note: While Self-Paced eLearning solutions can be used effectively when combined with Virtual Classroom and blended solutions, this standards guide deals specifically with digital training components that are Self-Paced. Virtual Classroom (synchronous/asynchronous facilitated) solutions are explained in Appendix G: Virtual Classroom. Information on Blended Solutions is located in Appendix H: Combining ADL and Traditional Training.

III. Process



The process shown above mirrors the process framework illustrated in Appendix C: Common processes and forms. For a description of each phase and process element, see Appendix C, Common processes and Forms. Specific sections within this appendix address each process block.

- [Method Selection](#)
- [Initiation](#)
- [Pre-Design](#)
- [Design Philosophy](#)
- [Statement of Work](#)
- [Project Plan](#)
- [Design Document](#)
- [Design Flow](#)
- [Assessment Plan](#)
- [Functional Prototype](#)
- [Scripts and Storyboard](#)
- [Development](#)
- [Acceptance Testing](#)
- [Deployment & Closure](#)
- [Lifecycle Sustainment](#)
- [Evaluation](#)

A Note about Delivery Requirements

To reduce risks, increase quality, and minimize unnecessary effort, a “Rough, Polished, Final” iterative cycle is required for most deliverables. The chart below illustrates how this would work for the design flow.

Table: Deliverable Iterations

Rough Design Flow	Government will review Rough Design Flow and provide feedback. Understand that roughs may include questions for the reviewer / SME and may not be complete.
Polished Design Flow	Government will review Polished Design Flow and provide feedback.
Final Design Flow	Final Design Flow integrates feedback from polished review cycle. Final submissions will be repeated (up to 5 times) until accepted.

The methods used for risk control and review shall be agreed upon at the project kick-off and may be dictated in the performance work statement. Some deliverables may not require a rough delivery and some projects may not have the schedule or resources to accommodate this risk mitigation strategy.

A rough > polished > final delivery sequence shall be followed unless indicated:

- within a deliverable definition
- within the statement of work
- during the project alignment

One notable exception to this sequence requirement is the functional prototype. While prototype media elements may be delivered in a rough state for validation, the functional prototype shall be delivered in a polished state.

This expectation is not intended as a burdensome requirement and should not require additional resources to accommodate.

A Note about Scope Creep

This is an expectation of the customer, stakeholders, and subject matter experts.

The ADL selection, design, and development process is designed to minimize risks late in the process. The practice of scope creep late in the design or development of a product can produce unfortunate, expensive, and painful results. This is why it's critical to establish and validate solution requirements upfront and provide sufficient resources to review each delivery increment.

Table: Process States

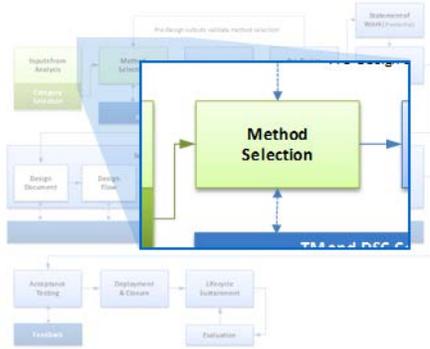
Air	Liquid	Gel	Wet Concrete	Set Concrete
<ul style="list-style-type: none">• Selection• Initiation	<ul style="list-style-type: none">• Design		<ul style="list-style-type: none">• Development	

The “states of matter” analogy above illustrates how difficult it becomes to make significant changes in latter stages of design and development. The outputs become harder to change the further you get into the project.

As a customer, stakeholder, or subject matter expert you'll want to provide input, guidance, and course corrections early to prevent having to rework deliverables later in the project. This is considerate to the vendor and will save you time in the long run.

IV. Method Selection

Self-Paced eLearning solutions **shall not** be selected for their technological appeal or based on the assumption that a particular generation of learner expects a form of multimedia packaging.



Appropriate selection of a digital training solution is derived by asking the right questions, involving experienced consultants early in the process, and including the right stakeholders to clearly identify the performance problem that needs to be solved.

During the method selection phase, analysis data is examined, business and performance requirements are identified, the tasks and audience are defined, stakeholders are identified, and solutions are weighed for potential suitability / cost.

During the method selection phase, participants will be asked to:

1	<p>Prepare for a method selection consultation with a Digital Solution Consultant.</p> <ul style="list-style-type: none"> Review the Primary Considerations. This section provides a list of questions you'll want to be prepared to answer. Review Setting Expectations for the Type of Course. These expectations are critical to estimation and selection and will help guide the conversation. Review Cost Estimation Criteria. This will provide a framework of variables your consultant can use to provide a more accurate cost estimate.
2	Complete the Performance Requirement and Tasks Worksheet prior to the consultation.
3	Complete the Suitability Factors Worksheet prior to the consultation.
4	Complete the Stakeholder Map prior to the consultation.
5	Conduct a search of GOTS / COTS sources for potential solutions.
6	Schedule a consultation with a DSC through the ADL Program Office. The DSC will help you narrow your performance requirements, and will provide recommendations, estimates, and solution alternatives to help you meet your business and performance goals.

Primary Considerations

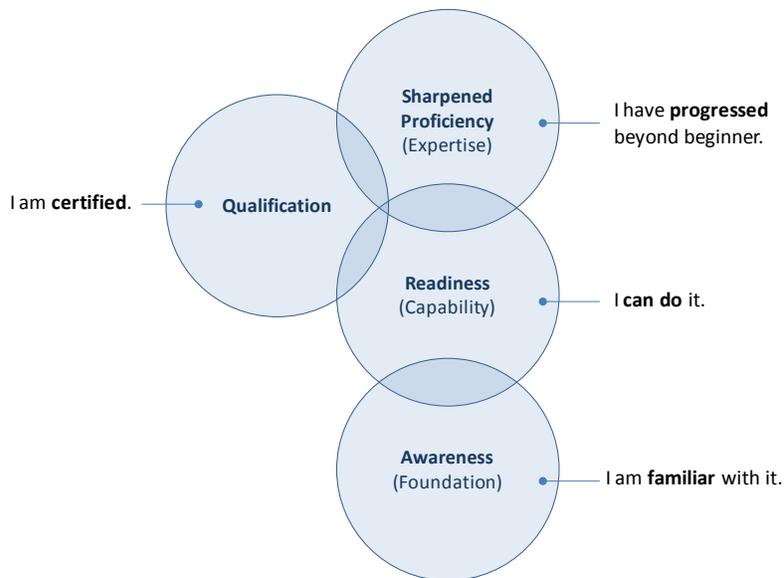
Before selecting Self-Paced eLearning as a method for solution, these factors must be considered:

Tasks and performance requirements are the primary drivers of a Self-Paced eLearning solution. Information and knowledge are secondary.	
Performance & Business Requirements	<p><i>What is the business or performance requirement driving the selection of Self-Paced eLearning?</i></p> <p>A performance analysis will reveal performance requirements. Often, a Self-Paced eLearning solution is also driven by business requirements. Bring these requirements to the selection table as you discuss solution options.</p>
Task Definition	<p><i>What tasks will the Self-Paced eLearning solution address?</i></p> <p>Solution requirements shall be determined by task or task group. A group of tasks associated with a performance requirement may not match up with the same solution method.</p> <p>For example, Task A and B could be suitable for a Self-Paced solution while Task C is best solved with a Job Aid and Tasks D, E, and F are better solved using resident training.</p>
Step Definition	<p><i>Are the tasks defined to the step level?</i></p> <p>Steps will be validated during the pre-design analysis.</p>
These factors can also influence a method selection.	
Solution Context	<p><i>Where and how does the learner require performance support or skill development? Does the learner need to:</i></p> <ul style="list-style-type: none"> • Learn new skills in anticipation of performance • Extend existing skills to advance capability • Refresh existing skills for currency • Recall and apply skills for performance after training • Update skills after system or process has changed • Leverage tools for performance in lieu of training • Respond to an urgent requirement to perform a new task

<p>Resources</p>	<p>Cost is a large factor in the selection of a solution. The budget and cost estimate should also frame value expectations in each deliverable.</p> <ul style="list-style-type: none"> • <i>What is my budget?</i> • <i>How does the cost of the solution weigh against the cost of the problem?</i> • <i>Would a cheaper solution solve my problem almost as well?</i> • <i>When do I need the solution?</i> • <i>How much time do I have to commit to the solution?</i> • <i>Do I have reviewers / SME's available?</i> <p>A solution consultant can help you nail down resource costs and commitment requirements. Contact the ADL Program Office or Performance Technology Center to schedule a consultation.</p>
<p>Technology Requirements</p>	<p>Technology requirements can drive the cost of the solution. Just remember to make sure that the performance requirements are driving the technology requirements.</p> <ul style="list-style-type: none"> • <i>Is the audience equipped to use the solution?</i> • <i>What type of technology is required?</i> • <i>Will the application of technology create additional problems?</i> • <i>What level of media fidelity will be required for the solution?</i>
<p>Audience Demographics</p>	<p><i>Who is my audience? What is their current skill level?</i></p> <p>Your audience is also a large factor in the selection of a solution. Ideally, you will take the opportunity to involve a portion of your audience in the selection, design, and development of the solution.</p>

Setting Expectations for the Type of Solution

As you consider the performance requirements and audience needs, think about the type of lesson, module, or course you need to create. You don't want to create a novice level course for experts. Your expectations for the type of solution should align closely with your performance requirements and audience needs.



Are you looking to create or maintain experts, provide certification, provide readiness, or simply provide familiarity with a set of concepts or rules?

Sharpened Proficiency	Perform Principle Perform Procedure	Lessons build procedural and strategic skills	Advanced Concepts & Practice
Readiness			Basic Concepts & Practice
Awareness	Inform	Lessons communicate information	Basic Familiarity

It's important to draw the distinction between proficiency, readiness, and qualification. The mechanics for attaining each of these levels differs by context. Qualification is often a local certification of readiness to perform in a mission role. Proficiency is the increased expertise and performance for a member who has a current qualification. Readiness is organizationally defined, primarily as preparedness to execute a competency or to a particular performance standard. Self-Paced eLearning alone cannot provide qualification, but can assist maintaining proficiency and readiness if appropriately designed.

Cost Estimation Criteria

As mentioned above, cost can be a large factor in the determination of a solution. This is often one of the first questions asked in the solution discussion. The selection and production of a solution must be driven by the performance requirements and informed by the aspects defined in the table below.

Estimates shall not begin with an assumption of seat hours and level of interactivity. This estimation method is not accurate and can produce a solution driven by the wrong factors.

A digital solution consultant (DSC) can help you with an Independent Government Cost Estimate. To help in the estimation of cost, please try to provide answers for the following criteria for each task:

Table: Cost Estimation Factors

<p>Media Expectations</p>	<p>By separating the media requirements from the solution, we can isolate the costs of the solution and clearly define any cost reducing GFI elements we can provide to a service provider.</p> <ul style="list-style-type: none"> • What types of media are expected / required? • What level of quality / fidelity is expected / required? • What media do you have to supply as GFI?
<p>Current Performance Level</p>	<ul style="list-style-type: none"> • How would you describe the current performance level of your target audience? • How much do they already know? • How proficient is the audience at pre-requisite tasks?
<p>Target Performance Level</p>	<ul style="list-style-type: none"> • How would you describe the desired performance level of your target audience as a result of the requested solution? • Are other follow-on solutions planned for additional skill development, practice, and assessment or will this solution stand alone?
<p>Task Complexity</p>	<ul style="list-style-type: none"> • How complex is the task (simple, moderately complex, complex)?
<p>Task Ambiguity</p>	<ul style="list-style-type: none"> • Is the task well defined? • Are the steps well documented? • Can the SME explain exactly how to perform a task? • Are there many “right ways” to perform this task?
<p>Information Scope</p>	<ul style="list-style-type: none"> • Considering the target audience, what knowledge (concepts, facts, procedures, principles) is required for expected task proficiency? Of this list, which elements does the audience not grasp? • What information is “nice to know” for this task? How much of this “nice to know” information is expected to be included?

Worksheet: GOTS / COTS Search Results

Use the form below to capture and document a due diligence search for Government Off-the-Shelf and Commercial Off-the-Shelf tools and products. Document costs per unit as well as recommendations and reasoning for consideration or exclusion.

Product / Source	Applicability Review	Cost
<i>Commercial Example.</i>	<i>This product was found to sufficiently meet EO 1.1, 1.3, and 1.5. However, the other EO's did not provide sufficient match.</i>	<i>\$ per seat.</i>
<i>Government Example.</i>	<i>This product meets all EO's under TPO 1.0. However, the look and feel of the product is dated. Recommend using Sections 1 and 2 of this program as a design reference.</i>	<i>FREE</i>

Use this worksheet to capture government or commercial solution opportunities. Cost data will be weighed against the cost of producing a custom training solution.

See the MS Word Worksheets for a functional example.

What's next?

Cost, audience, and performance requirements will be weighed in the solution recommendation. A digital solution consultant (DSC) can help to answer these questions and to select a solution that meets your performance requirements.

Before engaging with the DSC, fill out the Task Worksheet and Suitability Worksheet on the next 3 pages. The second page of the Suitability Worksheet includes another brief list of questions you may want to begin thinking about before the consultation.

These worksheets will help you to frame your solution requirements. The worksheets will also help your DSC provide recommendations, estimates, and solution alternatives to help you meet your business and performance goals.

Worksheet: Performance Requirement and Tasks

Date of last analysis	01JAN2000	Analysis type	JTA
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Performance / Business Requirement

This block captures a short description of the problem, job accomplishment, and major accomplishments targeted by the solution request. Document all outcomes and desired results.

Tasks

Isolate system faults.

Complete the maintenance report using the logistics system.

Use this worksheet to capture performance requirements and tasks. This information will be carried forward into other worksheets.

See the MS Word Worksheets for a functional example.

Worksheet: Suitability

Complete this worksheet to determine whether Self-Paced eLearning could be an appropriate solution to your performance problem. This should provide an indication of suitability. A DSC can help you narrow and validate your selection.

Tasks that meet one or more of these descriptions indicate potential suitability.	
	Training needs to reach a large number of people.
	Audience is widely dispersed and operates on varied schedules.
	Audience members have varying skill levels and experience.
	Tracking and reliable accountability of skill acquisition or information exposure is required by policy or for qualification.
	Performance concepts or information may change frequently.
	Skill practice is required and real equipment or a simulator is impractical or practice of dangerous tasks is required.
	Continuous practice, frequent refresher, or retraining is required to maintain currency.
Tasks that meet one or more of these descriptions indicate the task may not be suitable.	
	Performers don't have access to the technology needed to deliver the solution or technical support will be unavailable.
	Leadership or management at any level of the organization may not accept, support, or commit to the solution.
	The training is optional. Elective training elements may not get enough use to provide value.
	Task requires observation of physical performance for qualification.
	Users will not accept the solution.

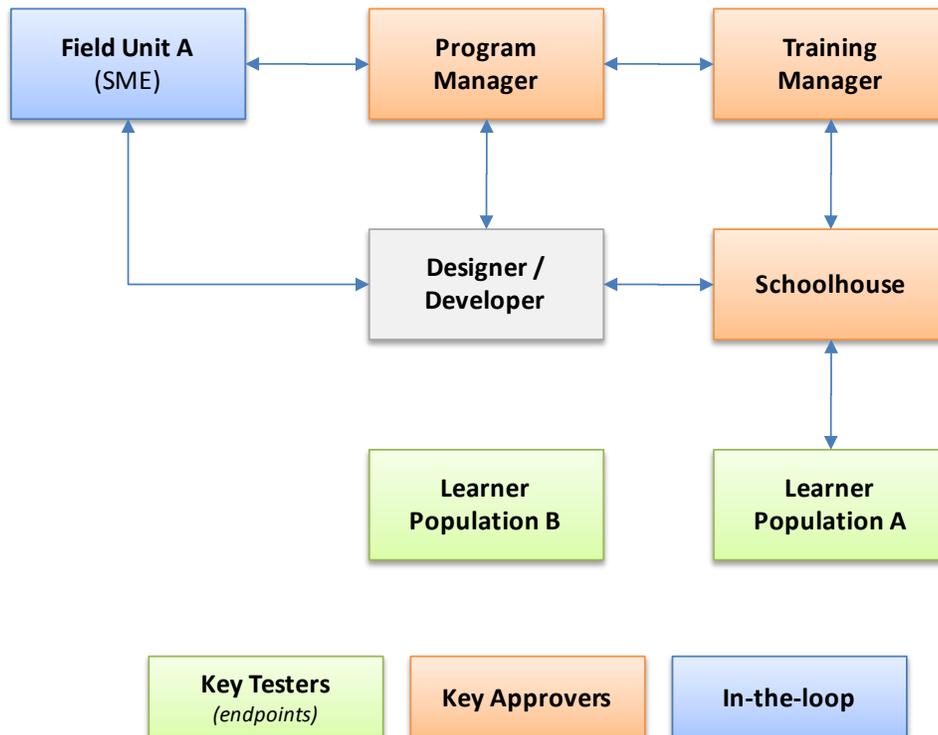
See the next page of this worksheet for a question series that can increase effectiveness of the training solution.

Maximizing Success

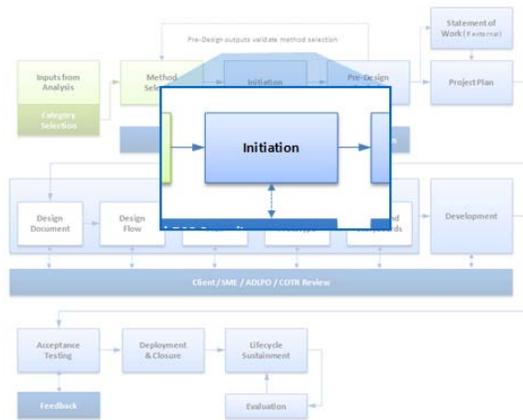
Self-Paced eLearning is most successful when the solution is...	
Perceived as useful	What degree does the user believe the solution will enhance his/her job performance?
Perceived as easy to use	Does the user think the solution is easy to use?
Supported by management	Will management at all levels commit to the solution over its entire lifecycle?
Not resisted by community or organizational culture	Does the community prefer (or is conditioned to receive) other training delivered via other methods?
Deployed with the understanding that learners will be given time to learn	Is learning assigned during working hours or as a task after hours?
Tracked for completion and tracking data is accessible to both the learner and the qualification tracking system	Does completion fulfill qualification or currency requirements? Do both the user and the system have consistent access to completion requirements?
Necessary	Is Self-Paced eLearning the only practical method available for the training?
Mandatory	Is the training a condition of employment, qualification, or currency?
Meaningful and engaging	Is the training designed as a page turner? Do the performance objectives offer challenge appropriate to the performance requirements?
<p>Self-Paced eLearning may apply to some or all of the situations described below to provide job support and skill development anytime-anywhere and on-demand:</p> <ul style="list-style-type: none"> • <i>A Self-Paced program that stands alone.</i> • <i>A program that supports presentation by an instructor.</i> • <i>A program that supports formal on-the-job training.</i> • <i>A program that supports job qualification series or qualification requirements.</i> • <i>A program that supplements a larger curriculum.</i> 	

Worksheet: Stakeholder Map

Complete this worksheet to map all stakeholders associated with the performance or business requirement. Using the field below, list stakeholders in an outline form or provide a chart to illustrate the relationships between system stakeholders and the business goal or performance requirement.



V. Initiation



The initiation phase establishes the start of internal design and development or the commissioning of a contracted effort. Initiation assumes that method selection suitability has been validated and requirements have been identified.

To initiate a SPeL solution, the Program Manager or Project Sponsor contacts their program's Training Manager or the ADL office in FORCECOM.

After the consult and the decision to move forward with a Self-Paced eLearning solution, an ADLPO will be assigned. The ADLPO will schedule an alignment meeting with the Program Manager or Project Sponsor for internal or external development. The PM, ADLPO, and DSC document and agree on project scope, funding, timeline, and roles using a **project alignment agreement**. An example of an alignment agreement can be found in SOP 7, Appendix C: Common Processes and Forms.

Inputs to the Initiation Phase

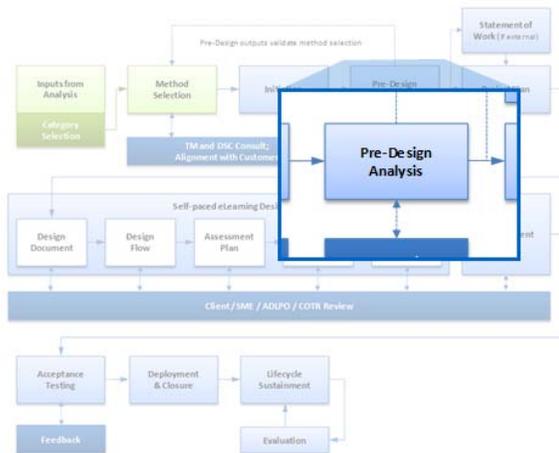
The outputs of the method selection phase become the inputs to the initiation phase. Work with your assigned DSC and ADLPO to complete these inputs prior to initiation:

- Any available analysis data and recommendations
- Performance Requirements and Tasks Worksheet
- Suitability Factors Worksheet
- Stakeholder Map

What happens next?

The ADLPO will facilitate a pre-design analysis prior to generation of the Statement of Work, in the case of a contracted effort, or the Project Plan, in the case of an internal development effort. The schedule and expectations for the pre-design analysis will be established during the initiation alignment.

VI. Pre-Design



A comprehensive pre-design analysis will reveal details about the audience, performance requirements, tasks, and training requirements.

These details are critical to an accurate estimate of level of effort and ensuring the solution meets business and performance goals. These details are also critical to a quality statement of work.

An accurate and complete statement of work reduces risks for both the vendor

and the customer and can also result in reduced costs and increased solution effectiveness.

Inputs to the Pre-design Analysis

The outputs of the method selection phase and any performance analysis data carry forward to the pre-design analysis.

- Any available analysis data and recommendations
- Any available audience analysis data
- Performance Requirements and Tasks Worksheet
- Suitability Factors Worksheet
- Stakeholder Map

What happens next?

A Pre-design Analysis (PDA) Report establishes the scope and requirements for internal or external development effort. If the pre-design analysis validates suitability of the selected method will meet the performance requirements, the ADLPO will help the project sponsor craft a statement of work for contracted efforts or move directly to a Project Plan for internally developed solutions.

The PDA Report will contain the Objectives Mapping Worksheet that appears at the end of this section.

Table: Pre-Design Analysis Report Requirements

Business Goals	<ul style="list-style-type: none"> • What are the performance / mission requirements?
Audience Analysis	<ul style="list-style-type: none"> • What is the expected performance threshold (novice, experienced, expert)? • What is the current average performance level? • What access does the audience have to technology?
Task Analysis	<ul style="list-style-type: none"> • Are all tasks associated with this performance requirement listed? • Have all tasks associated with this performance requirement been validated with the target performer level? • Has covert task data been included in the objective mapping worksheet? • Have task requirements and pre-requisites been included in the objective mapping worksheet?
Performance Objectives	<ul style="list-style-type: none"> • What are the draft instructional objectives for the solution? • How do these objectives map to the performance requirements?
Solution Scope	<ul style="list-style-type: none"> • How large is the solution? • What level of effort will be required to solve the problem?
Solution Selection Validation	<ul style="list-style-type: none"> • Does the data presented in the pre-design analysis validate selection assumptions? • Will the assumed solution work to resolve the problem? • Is the data represented by the analysis sufficient to support the design of the solution?
Independent Government Cost Estimate	<ul style="list-style-type: none"> • Has an Independent Government Cost Estimate been completed? <p><i>When delivered to a vendor or as part of an RFP, the IGCE must be removed.</i></p>
<p>The pre-design analysis report may also result in a revised alignment agreement and / or statement of work. While not always practical, the pre-design analysis will be conducted before the statement of work is constructed.</p>	

Challenges and Opportunities in the Digital Environment

As you collect pre-design analysis data or prepare to begin design, it's important to keep in mind the differences between the physical and digital environment. The facilitated training environment, like those provided by resident training and on-the-job training, provides adaptive features difficult to replicate in Self-Paced instruction. In the facilitated environment, assessments and activities can consider subjective measurements and provide adaptive feedback. This subjective measurement and adaptive feedback are the greatest strengths of the facilitated environment.

The digital environment is not the physical environment. Each environment presents challenges and opportunities, each presents strengths and weaknesses. Compared to the example used above, assessment in a Self-Paced environment is explicitly objective and limited to the logic programmed into the solution. When properly designed, the Self-Paced digital environment can provide safe opportunities for concept clarification, ample decision practice, and access to mediated feedback that may have otherwise been difficult to attain in the physical environment. For example, in a part-task activity a choice or challenge can result in a fire. This type of feedback is simulated differently in a classroom.

Familiarity with the unique strengths and weaknesses provided by the digital environment can create strong alignments in expectations. These alignments will result in well defined requirements and accurate objectives. Well defined requirements and objectives will likely lead to well designed solutions.

The transition from the physical environment to the digital is one of the toughest challenges for a traditional trainer or training designer.

Cognitive Tasks and Mental Models

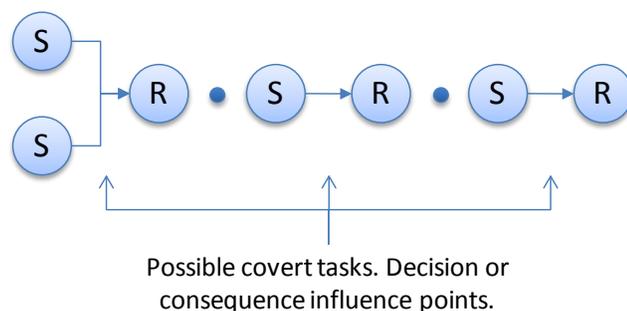
Many learners and designers consider SPeL to be intended for the transfer of knowledge or information. This is a short-sighted view of the capabilities of the medium. Self-Paced eLearning is capable of supporting complex practice of tasks requiring decision-making or problem-solving. When properly designed, the medium can perform on par or better than alternate methods including resident training. Given the power of independent practice opportunities for building foundational skills and the richness of a real-world environment, SPeL and resident training can be a potent combination.

Among the strengths of the digital environment is the opportunity for ample practice of “thinking tasks” or cognitive tasks and mental models. Thinking tasks and cognitive tasks are referred to as *covert tasks* in the SABA Peak Performance System. The success of practice opportunities presented in the digital environment is largely dependent on the discovery of these cognitive tasks and the explication of mental models. Covert task definition is critical to the definition of accurate instructional objectives, meaningful activities, and successful acquisition of real world skills using Self-Paced eLearning.

What process can be used to reveal and define cognitive (covert) tasks?

SABA Peak Performance System’s Phase II (Training Design) and Phase III (Training Development) of the Accomplishment-based Curriculum Development (ABCD) process demonstrates a method for deconstructing task-step actions to the operant level. Executed properly, this process of breaking down paradigms should reveal covert tasks, “thinking tasks”, and mental models. Other methods may also be used to define cognitive tasks and mental models. Regardless of the method used, SPeL can be difficult to successfully design without defining covert task elements.

As analysts and designers work through a performance analysis or task analysis, they should be ready to explore potential decision or consequence influence points between the stimulus and response.



How does the identification of cognitive tasks help designers write better objectives for Self-Paced eLearning courses?

In some cases, what we want the learner to do can be practiced and measured in the digital environment through task emulation. In other cases, we want to identify the measurable elements of the mental model or decision tree before constructing objectives.

Table: Comparing an overt and covert task set

What we want the learner to do	What the learner is thinking about
<ul style="list-style-type: none"> • Safely energize the XYZ system. (Application: Operate) <p><i>This action implies a clearly observable and measurable outcome.</i></p> <p><i>We can emulate this process and provide variable practice and feedback for the task, but we might want to break this down into cognitive tasks to provide better input to our design.</i></p> <p><i>This would be broken down into steps that represent the process. Each step might include an associated set of covert tasks.</i></p>	<ul style="list-style-type: none"> • Evaluate the current system state. (Evaluation) • Recognize hazards to safety and equipment associated with the light-off procedure for the system. (Comprehension) • Recall each step in the process of energizing the system. (Knowledge) • Interpret normal and abnormal system state feedback / warning after each step of the energizing task and take appropriate action. (Application) <p><i>This list breaks the task shown on the left into covert task considerations. These subcomponents to the task provide the assessment framework for practice tasks and may provide instructional framework to build specific foundational cognitive skills.</i></p>

Combined with tasks identified by performance analysis, cognitive task types help to determine the instructional objectives. A variety of methods are available to represent these knowledge types. This appendix will refer to Bloom’s taxonomy, but other representations can also be helpful (RLO/RIO and Gagne’s).

Connecting Performance Requirements with Design Choices

Ultimately, the performance and training requirements revealed in the performance analysis determine the selection and construction of instructional objectives. These instructional objectives determine the framework for activities within the course. The audience analysis and the nature of the activities determine the information and performance concepts that will be included in the SPeL course to support successful practice.

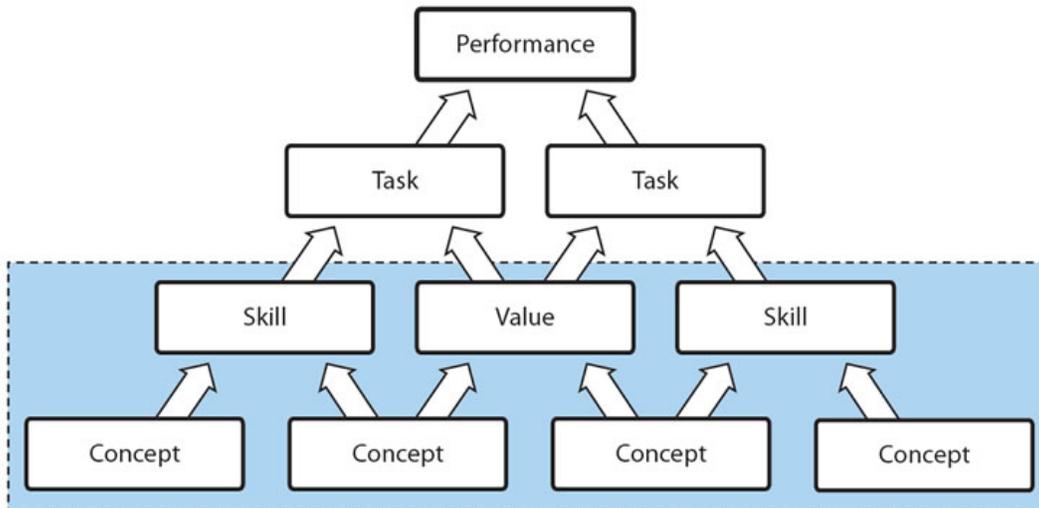
- The chain of design begins with definition and validation of performance requirements. These performance requirements provide the tangible connection between the mission requirements and the tasks mapped to the job accomplishment.
- Training requirements are derived from the task definition and data uncovered in the pre-design analysis. The training requirements bridge the task requirements to the instructional objectives.
- The instructional objectives connect the training requirements to choices made in the design of assessments and activities.



Performance requirements are connected to design decisions with a series of critical components. A design that ignores any of these components may end up with a weak or non-existent connection between the design and the performance requirements.

Selection and Construction of Instructional Objectives

Instructional objectives define the foundation (concepts, skills, and values) for the performance pyramid represented in the illustration below. The objectives define the actions as well as the measurements that will be employed in the solution.



The Foundational Elements of Organizational Learning

As a foundational element, instructional objectives are critical to the success of the SPeL design effort and ultimately the success of the product. Strong instructional objectives clearly describe the performance outcome in measurable terms, support high levels of learner participation, and provide a framework for rich and authentic task feedback.

Draft instructional objectives are one of the many outputs of the pre-design analysis. These draft objectives also provide core inputs to the construction of a statement of work. These objectives may evolve during the design phase.

These questions can be helpful when constructing instructional objectives:

- *What do I need the learner to **do**?*
- *What **skills** help the learner accomplish the thing I need them to do?*
- *What **decisions** does the learner make while they perform this action?*

Use the Objective Mapping Worksheet on the next page to map performance tasks to cognitive tasks, document task requirements, and define draft objectives. This worksheet should be attached to the pre-design analysis report.

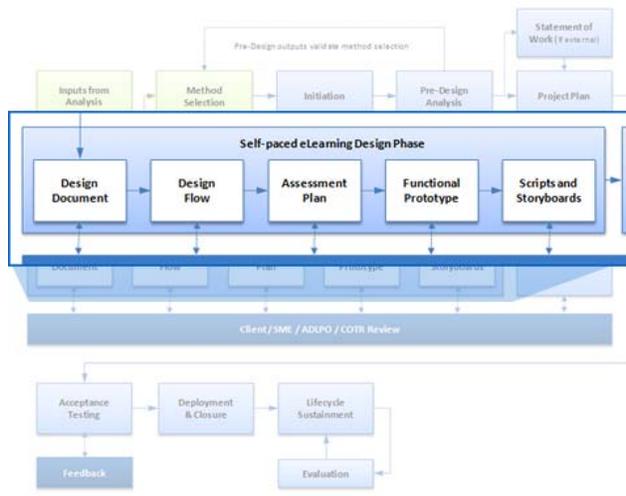
Worksheet: Mapping Objectives

Performance Task	Covert Task	Task Requirements	Objective
<i>Secure electrical breakers prior to opening Box Y.</i>	<i>Recognize consequence of failure to secure electrical breaker.</i>	<i>Requires normal color vision. Also requires qualification as electrician.</i>	<i>Given a model representation of an electrical system, secure the electrical breakers for the system each time before Box Y is opened.</i>

Use this worksheet to capture task requirements and covert tasks.
 This information will be carried forward into other worksheets.

See the MS Word Worksheets for a functional example.

VII. Self-Paced eLearning Design



The design phase combines the tasks of curriculum and lesson planning, instructional design, creative writing, and software specification to establish the blueprint for the solution. Design does not assume software methodologies or software platforms but does consider the constraints of development and delivery.

This phase builds on the previous work done in the method selection and pre-design analysis phases. The table below describes the activities and the outputs of the design phase.

The following outputs will be generated in this phase:

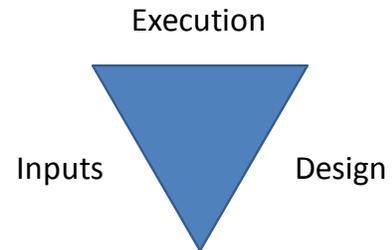
1	The Project Plan provides the execution framework for the project effort.
2	The Design Document represents all goals, objectives, instructional strategies, types of training materials, and evaluation methods for the solution.
3	The Interactions Worksheet will describe the actions the learner will complete.
4	<p>The Assessment Plan defines the strategy for all test items. Two tools are provided to assist in the development of the assessment plan.</p> <ul style="list-style-type: none"> The Assessment Items Worksheet describes performance measurement items and each items relationship to an objective. This worksheet will be attached to the assessment plan. The Assessment Item Validation Checklist will help you validate your test items.
5	The Design Flow expands on the assumptions established in the design document and provides a high level mapping of the solution.
6	The Functional Prototype demonstrates a small portion of the design strategy in a section of storyboard and prototyped output.
7	Storyboards and Scripts represent all screen presentations, activities, and supporting materials for the solution.

What affects the quality of a Self-Paced eLearning project?

Three main factors influence the resulting output. While the activities that make up these factors are not isolated, the results will suffer if any one component is deficient.

Inputs

The pre-design analysis lays the groundwork and provides inputs for the design effort. If the pre-design analysis addresses all of the inputs to the design, the path to the final design will be free of most obstacles common to SPeL design that ignores the practice of pre-design analysis.



Design

Self-Paced eLearning design is a complex task and can require skills from multiple disciplines to produce a quality result. Close involvement of each of these disciplines during the design stage is critical to the success of the design. Design is problem solving and eLearning can present an array of different problems and challenges. Many of these categories can overlap. **Each category contributes to a successful output and professional competency is expected in each design domain for all contracted outputs.**

Table: Design Problem Solving Categories

Instructional Design	Provides expertise in designing the instructional framework for the solution.
Communication Design	Communication design includes visual and narrative message design for the solution. Disciplines that belong to this design category include designers with expertise in written and visual communication.
Experience Design	The design of the learning experience extends to the mechanics of interactions, the flow of the activities, and the behavior and availability of interactions.
Technical Design	Design recommendations from each of the design categories above may present technical challenges. The technical designer provides recommendations to resolve these challenges.

Execution

Execution includes the assembly and production tasks that pull each planned element into a final product. Work styles and methods vary for execution. See the [development section of this appendix](#) for specific packaged delivery requirements. Each of the design disciplines listed continue involvement throughout the production process.

VIII. Design Philosophy and Principles

Self-Paced eLearning solutions shall present meaningful learning experiences.

What is a meaningful learning experience and why is this critical to the design of SPeL solutions?

A meaningful learning experience is defined in terms of change in the learner. Without a change in the learner, there has been no learning. If the change is not lasting and important to the learner's work, the learning experience is not meaningful. A meaningful experience:

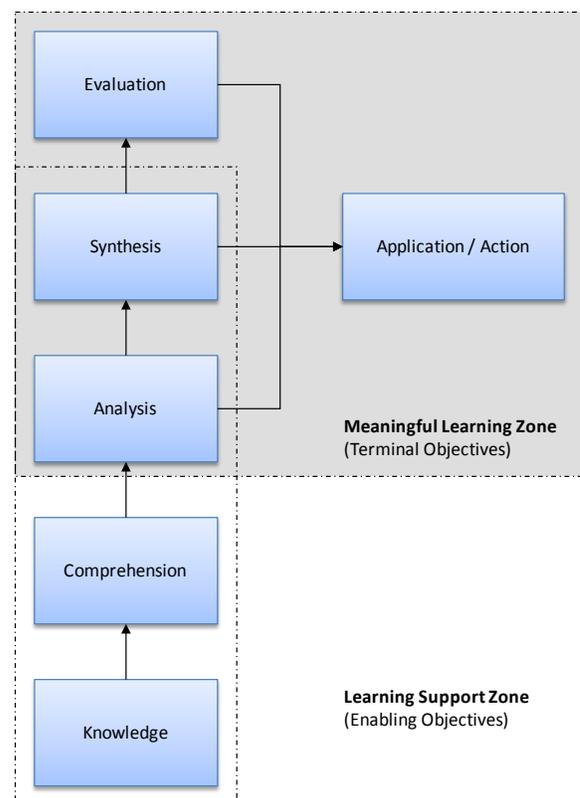
- Provides personal or professional enrichment
- Enables the performer to contribute to a workgroup or community
- Prepares the performer for the world of work

How is a meaningful learning experience evaluated?

Begin evaluating the design for a learning experience by examining the level of the objective. The graphic to the right represents two zones of Bloom's Taxonomy.

The upper zone represents meaningful learning actions. These objective actions require the learner to engage in higher level problem solving and can help designers create more meaningful terminal performance objectives.

The lower zone represents support actions. While these actions and verbs can support a meaningful learning experience, they can rarely create this experience alone. If the terminal performance objectives for the course fall into Knowledge or Comprehension levels of Bloom's Taxonomy, the learning experience might not be meaningful.



The type of objectives used to frame the experience is only one of the methods that can be used to evaluate the experience. Once the course has been produced, the level of learner engagement can provide a relevant measure of the meaningful experience.

What is the Coast Guard’s philosophy for SPeL design?

Self-Paced eLearning courses focus on three primary values	
Performance	<p>The actions and outcomes of performance apply to every training and support product developed by and for the organization regardless of context or packaging.</p> <p>Mission accomplishment is the goal; job performance is the prime consideration.</p>
Relevance	<p>When providing support for performance outcomes, training solutions must focus on concepts and information that hold importance to the learner’s relationship with the job or task. This focus considers the learner’s previous experience and the desired performance level (awareness, readiness, proficiency).</p> <p>Focus the solution; avoid adding content with limited relevance to the desired performance.</p>
Respect	<p>Coast Guard men and women work in a variety of environments, often with limited access to technology and little time for activities that don’t directly support mission operations.</p> <p>Respect the learner’s time and environment.</p>

Self-Paced eLearning courses should also encourage or require active participation in the learning experience. A passive experience relegates interactions to reading text on screen, listening to audio, or watching a video presentation. These methods can be appropriate to present or demonstrate facts, concepts, and procedures. An engaging experience is activity centric (not information centric) and considers engagement, challenge, and motivation as core elements of the design. Activity types are driven by the objectives.

Review Opportunities

Learning content will also make provisions for convenient review of selected portions of lessons. Review opportunities can be presented either upon completion of mandatory elements or provided by default (open review).

Appropriate Practice

Practice refers to the authentic employment of skills and knowledge within a performance context. For example, selecting control settings, analyzing situations, making decisions, and taking corrective actions. Practice provides an opportunity to:

- Safely apply skills and knowledge prior to testing.
- Interact with media in the context of the learning activity.
- Identify where more practice is required.
- Access rare feedback and remediation opportunities.

Designed properly, complex practice exercises will be preceded by more simple practice exercises. This supports a steady progression of increasing task difficulty while enabling learners to return to easier tasks or receive additional prompting.

Each action within a practice exercise must be accompanied by a clear action prompt. An action prompt is a statement or phrase that alerts the learner that an action is expected.

Key Demonstration Points for Procedural Practice and Progress Checks	
1	Display the name of the procedure to initiate a demonstration of the task. Additionally, use the name of the procedure to initiate the practice sequence.
2	Show a demonstration of the procedure. Include all display changes, audible tones, and control inputs.
3	If a step involves a decision, state each decision as a separate step.
4	For complex procedures, progressively list each step as it is demonstrated or performed.
5	Provide aided practice as a part of the presentation segment where appropriate.
6	If there are common errors in performance, provide this information after the learner has completed the exercise.
7	Consistently indicate action prompts (location, color, text features, and prompt frame) to make it clear when an action is required.
8	Provide progressive confirmation of each step as it is successfully completed.
9	Provide procedural help / tips on any step where the learner might get stuck or when the learner makes a number of incorrect inputs. Automatically clear help / tips when a correct input is made.
10	For progress checks, do not display help or tips. Provide a procedural prompt after the learner makes two incorrect selections and record the score for the step as unsatisfactory.
11	When a progress check has been completed, display an after-action report to inform the learner which steps they performed correctly.

Free Play Practice

Free play practice provides control-display emulation of equipment and user interface that empowers the learner to experiment with the emulation.

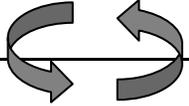
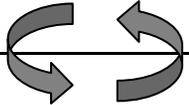
Note: While free play provides a powerful learning opportunity, it can be costly to develop.

Employment of a Learning Strategy

Designs shall employ an appropriate learning model to ensure that learning is complete and appropriate to the complexity of the task. See the chart on the next page for model examples.

Learning strategies are employed to increase the number of links between presented information and existing knowledge. Self-Paced eLearning provides opportunities for learning strategies that are difficult to reproduce in other instructional delivery mediums. Learning strategies are selected based on the learning context, audience needs, and learning objectives. These strategies inform the selection of interactions and the selection of media.

Learning strategies are a deep subject of study. This appendix will not address specific learning strategy models in detail. However, designs **will** be assessed for completeness. An incomplete design is likely to result from failure to use an appropriate learning strategy. See the table on the following page for examples of learning strategy models.

INTERNAL LEARNING PROCESS	9 EXTERNAL INSTRUCTIONAL EVENTS: GAGNE	HARLESS 6P	DDPA MODEL	
<u>Alerting</u> the learner to receive information (stimulus)	Gaining attention	Preview	Deliver	
Setting <u>expectations</u> for the outcomes of learning	Informing learner of lesson objectives			
<u>Retrieval</u> of items in long-term memory for use in the working memory	Stimulating recall of prior learning	Prepare		
<u>Focusing</u> on the content of the learning material (selective perception)	Presenting the content	Prime		
<u>Gathering and processing (semantic encoding)</u> of presented material, to create a form for long-term storage and ready retrieval (recall or recognition)	Providing learning guidance	Prompt		Demonstrate
<u>Responding</u> with a performance that verifies learning has occurred	Eliciting performance	Perform (readiness verification)		
<u>Reinforcement</u> , to ensure that the results of learning are established and integrated into long-term storage (knowledge)	Providing feedback			Practice
Providing <u>cues</u> that activate cognitive access to desired information (used for recall or recognition)	Assessing performance			(initial and variable adaptations with feedback)
<u>Generalizing</u> performance to new situations and instances of learned behavior	Enhancing retention and learning transfer	Practice		
The Coast Guard uses the SABA Peak Performance System for Performance Analysis. The 6P Model Described above is part of the Curriculum Design Process.			Assess (readiness verification)	

Determining Interactions

Interactions must support learning objectives.

Interaction design is a complex art that considers the notion of mental models, metaphors, mapping, affordances, senses, and the user's environment. Interactions are selected and designed based on the learning objectives or based on the need of the learner. An interaction isn't a bundled event, commodity, or condiment. Interactions aren't something that you add in after the content design is complete. Interactivity is the basis of communication. Interactions create a symmetrical experience that breaks the one way presentation model, propel the experience, and provide opportunities for participation.

Interaction selections should not be confused with media selections.

Levels of Interactivity

Many organizations separate interactivity into four levels. These four levels generally describe the complexity of the media and, to a lesser degree, the intensity of engagement through features that appear at each level. These models often and mistakenly include media complexity / quality at various levels. As mentioned above, interaction selections should not be confused with media selections.

Level	Description	Task Complexity	Cost
1	Linear user controls and simple feedback	Low	Very Low (7-10K)
2	Linear / branched user controls and remediation pathing	Medium	Low (7-15K)
3	Adaptive user control with complex and adaptive remediation and alternate presentation	High	Moderate (20-25K)
4	Adaptive and shared with after action-review	Very High	High (Varies)

A screen count per hour of instruction is commonly associated with each level of the interactivity model. While this is a widely used heuristic and a helpful tool in approximating level of effort for an entire course, it isn't very helpful for making accurate connections between learning goals and interaction selection.

An estimation based on generalized description of interactivity levels using models similar to the table above is rarely accurate. When used to drive requirements, an arbitrary assumption based on this inaccurate model can lead to misalignment between the goals and the execution of the solution.

For specific interaction choices involving specific tasks, the level or complexity of interactivity should correlate directly to the complexity of the task or sub-task. Strategic design choices that center on meaningful actions should drive the learning experience.

The Interactivity Trap

Technologies are not inherently interactive. Interactivity in multimedia is commonly defined by the complexity of manual interaction that includes a drag, slide, click, or branch. This can frame the design of a Self-Paced eLearning experience around the activity of information transport.

To “make the course more fun or to gain attention and to wake up the learner” a designer may be tempted to dress up the presentation with empty drag, slide, click, or branch gimmicks. Don’t fall into this trap. A meaningful interaction presents the opportunity to **participate** in a contextual activity that will result in sharpened cognitive skills and an outcome that produces a real skill change. Interactivity provides meaningful practice.

Common Types of Interactions / Activities

Many factors can influence the types of learning activities selected. In addition to the types of objectives and performance, budget, timelines, the type of authoring software used and the expertise of the development team may determine the types of learning activities selected. The table below presents a few common interaction and activity types.

Activity	Description	Useful when
Drill and Practice	Drill and practice may involve a series of questions and visual presentations. This provides repetitive practice at the stimulus-response level. The learner must demonstrate competency at an established standard.	<ul style="list-style-type: none"> • Learning basic facts or terminology • Reinforcing and sharpen previously learned skills, concepts, or behaviors. • Demonstrating an established performance standard. • Recording a history of performance achievement or progression.
Tutorial and Inquiry	Tutorial and inquiry is similar to programmed instruction. This breaks the presentation into small steps followed by challenge questions about each step. This strategy evaluates the learner's responses, branches based on the response, and provides review and remediation. Tutorials can include parallel alternatives or branches to accommodate varying trainee responses.	<ul style="list-style-type: none"> • Learning new procedures or guidelines • Minimal instruction is required for performance • Remedial instructional requirements have been identified • Performance needs to be monitored and evaluated
Authentic Context / Simulation	This strategy imitates or emulates a real situation. This can provide an opportunity for the learner to access computer-controlled models of physical elements (parts, equipment) and social elements (people) to practice skills and receive feedback on performance without affecting equipment or environment.	<ul style="list-style-type: none"> • Hands-on practice is impractical due to safety or resource constraints • Lab time is limited or unavailable • Practice time in the physical environment is limited • Problem-solving skills need to be measured at a granular level

Factors Important to Interaction Design

Interactions appear both as the driving force for the experience and at the core of activities. These activities are directly linked to the learning objectives and represent the actions or abstraction of interactions taken by the learner. Activities can include part-task practice activities, immersive 3D environments / models, and games that provide the learner an opportunity to experience a task or concept from multiple perspectives. Activities can also help the learner make meaningful connections to the task through experimentation. If the objectives are framed properly, the selection and construction of interactions becomes much easier and far more natural.

Table: Interaction Design Factors

Goal	A goal drives the selection of the interaction and defines the purpose of the activity. This goal should align with the goal of the user. In the case of an activity interaction, this goal should match or support the learning objective(s). Is the purpose of the interaction clear?
Feedback	Feedback is required. Without feedback there can be no interactivity. Interactions provide a great opportunity to connect rare and authentic feedback with choices to reinforce consequences of action. One characteristic of feedback is responsiveness. In other words, does the user get the expected response when performing an action? Do they have to wait for this response?
Control	Do users have control over their access to information and activities? Is the experience forced linear or is open navigation presented? Forced linear controls can be appropriate in some situations.
Variety	Is the interaction similar to other interactions? Is there a reason to present the same pattern of interaction again?
Pacing	How often is the learner encouraged to participate? What is the balance in symmetry of communication (ratio of presentation to participation)? Is the presentation of materials appropriately timed?
Context	Is the user offered an appropriate sense of context / place?
Complexity	The complexity of choices will align with the performance level of the user and offer opportunities for progression in complexity from simple to more complex.
Progression	Is the progression of the activity appropriate? Does the activity build on the complexity of a previous experience?

Use the worksheet on the next page to **define core interactions and activities** for the Self-Paced eLearning course.

Worksheet: Interactions and Practice Opportunities

Objective	Interaction Details	Rationale
<p><i>Given a model representation of an electrical system, secure the electrical breakers for the system each time before Box Y is opened.</i></p>	<p><i>Several practice opportunities will be offered to the learner within these tasks. These opportunities will present the learner with a visual representation of each component with the ability to change the switch state. Failing to secure the breaker will result in a no-go with a short feedback and remediation loop requiring the learner to repeat the exercise.</i></p>	<p><i>Securing power is a critical step in the completion of many tasks within this system.</i></p>

Use this worksheet to document **practice opportunities** and interaction strategies. This information will be carried forward into other worksheets.

See the MS Word Worksheets for a functional example.

Presentation Methods and Motivation

Decisions about SPeL presentation and methods used to motivate and engage the learner must begin with an understanding of how people learn. Research has provided support for several decision factors. While instructional strategies will be shaped by technology, resources, and culture; designers can leverage this research for more consistently positive results.

Instructional techniques include the use of examples, practice exercises, simulations, and analogies. Instructional methods provide a delivery agent for the instructional strategy and can include computers, workbooks, instructors, and other instructional aids. Media elements themselves include text, graphics, video, audio, and interactions used to present content and offer participation opportunities.

Instruction is generally presented in small bits, within small sequential steps, and generally from simple to complex. This aids in the acquisition of new concepts and skills while considering the effects of cognitive loading.

Programmed Branching

Rabbit hole navigation, or content branching that requires the learner to access multiple levels of a branched path to read content and return to select another branched path to read produces unnecessary cognitive load and is prohibited.

Programmed branching provides access to a progression framework (providing learning for some material before other materials), adaptive presentation (presenting concepts based on their level of mastery), or remediation based on performance of an activity. This type of branching can contribute significantly to the quality of a learning experience.

Presentation of Objectives to the Learner

Objectives shall be presented to the learner in the learner's language and, when possible, in the learner's context.

There is a difference between an objective (TPO, EO) that serves the needs of the ISD as they plan and validate their instructional strategy and an objective presentation form that works for the benefit of learners. Clinical objectives are dry and precise by nature and can be devoid of the type of direct context that can help a learner connect with the activity. All presentation should be strategically constructed to motivate the audience toward the goals of the program.

Six Research Based Principles for Effective Self-Paced eLearning

The table below outlines six principles from a study conducted by Richard Mayer at UC Santa Barbara as summarized by Ruth Clark. These principles provide a decision support foundation for presentation method selection and can influence the learner’s motivation to participate in the course.

The full article is located here:

<http://www.elearningguild.com/pdf/2/091002DES-H.pdf>

Table: Research Based Principles for eLearning

<p>Multimedia Principle</p>	<p>Use multimedia to improve learning. Adding graphics, illustrations, animations, and video that are congruent with the instructional message can improve learning.</p>
<p>Contiguity Principle</p>	<p>If text is used, make sure it’s displayed in close proximity to media used for similar purposes. Related text and visual elements should be located close together. A separation of these related elements will require extra cognitive resources.</p>
<p>Modality Principle</p>	<p>Use audio strategically to improve learning. Using both the visual and audio components of working memory produces a more positive impact on learning.</p>
<p>Redundancy Principle</p>	<p>Don’t narrate text displayed on the screen word for word. Providing narration that mirrors text displayed on the screen can hurt learning and motivation. This can overload the visual component of working memory. It is also inconsiderate to readers that may read slower or faster than the narrator.</p>
<p>Coherence Principle</p>	<p>Less is more when learning is the primary goal. Don’t add unnecessary media to the presentation. Adding these elements when they are not congruent with the instructional message detracts from learning. Decorative elements or media that are added for effect not only don’t help, but can hurt learning.</p>
<p>Personalization Principle</p>	<p>Use a conversational tone and apply human elements to increase learning. A conversational tone can be less alienating than an overly formal tone. The use of agents can also help learning when used in instructionally valid roles (by providing authentic and genuine help and advice).</p>

Text as Media

Treat text as you would any media element. As a media element, text must have a purpose and communicate clearly. The following characteristics must be considered when using text:

- Use active voice and present tense
- Avoid the use of pronouns
- Use concise statements
- Use concrete nouns, positive statements, and common vocabulary
- Use inoffensive, non-sexist language
- Define new terms the first time they are used
- Consider producing a glossary if there are several new terms
- Avoid the use of acronyms and abbreviations. However, use technical terms and abbreviations if they appear on equipment (example “EMER BST ON”)
- Use technical phrases rather than jargon (example “Emergency Jettison Button” vice “Panic Button”)

To emphasize text, use effects such as bold, italics, font size or color. Avoid using underlined text, as this indicates a hyperlink. Do not use flashing text unless using this effect to emulate equipment conditions.

Try to use 6 or fewer lines of text per screen on slide based presentations. Each line should contain no more than six words.

Use of Humor

Take care when using humor in training programs. Effective use of humor in multimedia requires skill and knowledge of your audience. Humor must be used professionally if used at all.

Selecting Media

Media selected to support an instructional strategy shall comply with the technical requirements outlined in the SOP 7: ADL.

Presentations and practice opportunities will take advantage of the benefits provided by media. Visuals and media will be matched to the task or concept complexity. A specific media selection model is presented in SOP 7, Appendix I: Media Selection Process.

Media Production Expectations

“Professional instructional media development services” implies the ability and willingness of the service provider to use media appropriately to solve instructional problems and provide the best value for the project cost. Failure to mention a particular media type in the PWS **does not** imply that a contract service provider can exclude that media type if the contract amount supports reasonable inclusion or industry service practices typically include these types as standard features.

Premium media elements, including high end video and 3D models will be specified and priced separately to prevent these elements from tainting the contract price. The tables below describe standard and premium media expectations.

These media types are considered standard for instructional media services deliveries.	
Audio	Audio, short video clips and visual illustrations shall be included strategically when instructionally appropriate to the audience and supported by technology. Video clips assumed here are short form and are delivered in web resolutions. These may also include a narration track.
Short Video Clips	
Images / Illustrations	
Interactions	Interactive activities that offer practice and feedback opportunities shall be included strategically when instructionally appropriate to the audience and supported by technology.
Concept Animations	Animated illustrations that clarify concepts or operations shall be included strategically when instructionally appropriate to the audience and supported by technology. Simple animations include annotation, highlight, and simple flow or mechanical interaction.

These **premium** media types are explicitly described in the PWS.

3D Models	3D Models shall be explicitly specified. When entertaining the purchase of a 3D model, consider the purpose of the model and the cost and benefit difference between the production, setup, and use of the model and the use of video or still photographs.
Produced Video	Polished or produced video shall be explicitly specified. This classification of video includes edited sequences in long form at broadcast resolution and may include transitions, overlays, and a narration and music track.
Complex Animations	Complex animations including complex 2D animation and those based on 3D Models shall be explicitly specified.
Emulations / Simulations	Emulations and simulations beyond a reasonable interaction shall be explicitly specified.

Assessments, Test Items, and Questions

It is common for Self-Paced eLearning assessments to assess recall of facts associated with a principle or procedure. Frequently, this does not represent a one-to-one correlation with the actual performance of the procedure. By over-sanitizing or over-simplifying the variability presented by the task challenge in the real-world, it becomes difficult or impossible to prove the training actually improved performance.

Research supports the value of questioning to learning. Questions and test items used to probe and facilitate elaborative responses can increase comprehension, critical thinking, and learning. Reflection exercises can also be used encourage higher order thinking and may significantly improve learning in some situations.

A meaningful assessment is part of a meaningful learning experience and the same [criteria that apply to the definition of a meaningful experience](#) also apply to a meaningful assessment.

The complexity of an assessment item shall match the complexity of the task being measured.

When writing test items for eLearning assessments, consider more test types than multiple choice questions. Test items should also consider multi-part decisions, approximations of the task, and authentic simulations of the task environment.

Determining Prior Knowledge and Skills

When an audience analysis does not determine a consistent set of prior knowledge and skills, a pretest should be used to determine current knowledge and skill level. This pre-test can be used to provide a test-out mechanism or tailor individualized instruction based on pre-test scores.

Confirmation of Learning

Progress checks and post-tests will be used to confirm learning. Post-tests will identify weaknesses based on the learning objectives.

Remediation

Remediation provides opportunities for enrichment of a learner's understanding of concepts and tasks, builds strong memory connections, and correct misconceptions, by:

- Adding circuits for wrong answers in progress checks and post-tests.
- Providing opportunities to make mistakes or explore alternatives.
- Providing opportunities for reflection.

Remediation will most often appear as an optional path. Forced remediation through extensive content paths can increase learner frustration. Remediation will also attempt to present information from a different viewpoint or at a different level of detail than the primary content path. If a learner didn't gain understanding the first time through the material, it's unlikely that repeating the same information will help.

Feedback

Feedback serves many purposes and will be carefully crafted for purpose. The application of feedback may vary by design context but will generally appear in one of the following categories:

Table: Feedback Categories

<p>Acknowledgement</p>	<p>When the learner takes an action or provides an input, the input must be acknowledged. This can be shown by displaying a visual indication (rollover) or by using an audio cue. In the case of an audio cue, the learner will be able to turn the sound on or off.</p>
<p>Positive Feedback</p>	<p>Feedback will be concise and positive in nature, kept in the context of the action or choice that generated the feedback.</p>
<p>Informative Feedback</p>	<p>Feedback is informative and corrective in nature. Feedback will specify what the correct answer is. Depending on the level of the learner, additional information supporting “why” may also be helpful.</p>

Feedback may adapt to allow more than one attempt. In this case, it may be appropriate to vary the feedback prompt to provide additional information. Feedback will also appear in a **consistent** place on the screen and use a consistent type of presentation.

Designers may choose immediate or delayed feedback. The application of feedback is largely up to the designer and will be based on the context of the learning objective and the expected learner.

What are the Coast Guard's requirements for test items?

USCG Training System SOP 9 offers specific supportable rules and methods for design and construction of test items. The test item requirements extend and complement guidance set out in USCG Training System SOP 9. Requirements may be modified by the PWS or during project alignment.

Table: Test Item Requirements

Format	For review purposes, test items, distracters, and feedback shall be delivered in a format defined in the SOW. For test items requiring QuestionMark™ Perception format, reference the e-Testing SOP for specific guidance.
Key	An answer key shall be delivered to accompany the test review as well as the final packaged test. The answer key must include the authoritative reference for the correct response. This reference must be the original reference and not the student materials.
Mastery Score	Default mastery (cut score) for Minimally Acceptable Competency (MAC) level shall be 100%. The default score requirement may be adjusted during the project alignment. The cut score should not be an arbitrary number (i.e., 80%). The Angoff method can be used to determine a defensible cut score.
Distracters	The test item and all distracters must be consistent with the course objectives and be educationally sound. The item stem, correct response and all distracters must be reviewed for clarity, relevance, ambiguity, cueing, appropriateness, bias (sexual, race, geographical, etc.) and validity. <i>Reference SOP 9, 5-1 through 5-22.</i>
Question Pooling	The assessment shall consist of a pool of 5 test items for each enabling objective. For every 5 test items in a pool, no more than 3 test items are selected for display in each test instance.
Packaging	For final delivery, assessments shall be packaged as part of the lesson SCORM package or as a separate SCORM package.
Pre-Test / Test Out	Learners shall be able to test out of sections of the course or lesson by taking a pre-test. The pre-test shall clearly indicate the sections mastered and enable a persistent indication of section mastery within the lesson menu.
Post-Test	If used, a Post-Test shall reflect the same questions used in the Pre-Test.

Test-Out: A Cautionary Note

When designing an assessment for the purposes of “testing-out” take care to validate the questions and the mastery score and ensure that all objectives are being tested by possible combinations of questions.

Start by categorizing critical performance areas that shouldn’t be avoided by a test-out mechanism. By validating test items, ensuring that each objective is sufficiently tested, or by providing a critical path that cannot be avoided by a test out, an experience can be provided that meets the performance and business requirements every time.

When building a test that allows the learner to test-out:	
1	Identify critical performance areas that must be presented regardless of pre-test mastery.
2	Validate that each objective is sufficiently covered by any possible combination of questions served in the test. Each combination of questions served must indicate 100% mastery of the correlating objective.
3	Objective mastery for test-out for a learning objective is typically 100%. If it is determined that a lower score is sufficient and practical, validate the mastery score decision using a scientific method (Angoff Method).

Use the worksheet on the next page to work up **assessment items** for the Self-Paced eLearning course. The **Assessment Plan** deliverable defines all assessment features for the solution.

Worksheet: Assessment Items

Objective	Criticality	Assessment Item	Reference
<i>Given a model representation of an electrical system, secure the electrical breakers for the system each time before Box Y is opened.</i>	<i>High</i>	<i>This is a step in many other system maintenance tasks. High consequence of error requires 100% accuracy. Assessment of this task / step must be accomplished through practice of the task in a larger task context (i.e., a set of maintenance or troubleshooting problems).</i>	<i>COMDINST X.1</i>

Use this worksheet to document measurement and **assessment opportunities**.
This information will be carried forward into other worksheets.

See the MS Word Worksheets for a functional example.

Checklist: Assessment Item Validation

	Does the test item measure a learner's ability to perform?
	Is the test item accurate?
	Is the test item clear and understandable?
	Does the test item have only one correct answer?
	Are all distracters non-ambiguous and within the realm of possibility?
	Are the answer choices keyed accurately?
	Is the wording or terminology correct?
	Are the test item and all distracters free of clues that might indicate the correct answer?
	Are supporting materials (graphics) relevant to the question?
	Do supporting materials (graphics) provide sufficient information to answer the question?
	Are graphics and other supporting materials clear, readable, and realistic?
	Does the test item require the learner to use the information in any accompanying materials to get the correct answer (application) rather than just find the answer (reading)?

See Training System SOP 9 for more guidance and requirements for writing test items.

Lesson Structure and SCORM

Deep course structures (course > module > lesson > topic) can introduce unnecessary complexity to a course design. These same deep course structures run counter to the value and core concepts of the SCORM content model.

The size of a course element is critical to reducing unnecessary cognitive load in course structure and maintaining reusability whenever possible. “Bite-sized” instructional blocks support meaningful learning experiences.

A SCO shall represent the smallest logical size of content to be tracked by the LMS.

The value supporting the design of SCORM conformant courseware revolves around four concepts. These are reusability, interoperability, durability, and accessibility. These concepts guide the design approach and will be taken into consideration as a design is conceptualized and assembled. [See the development section for specific SCORM technical guidance.](#)

Table: SCORM Package Design Principles

Reusability	<p>Content is independent of learning context and can be used in numerous training situations or for many different learners.</p> <p><i>While this concept works well at a general concept level, many performance requirements are contextual. Apply this concept when you can but do not allow reusability to limit the solution. Try to exclude structural labels (Course, Module, Lesson, Topic) whenever possible as these also imply contextual constraints.</i></p>
Interoperability	<p>Content will function in multiple applications, environments, and technology configurations regardless of the tools used to create it or the platform on which it is delivered.</p> <p><i>This concept applies directly to the development of content but will be kept in mind as content is designed.</i></p>
Durability	<p>Content does not require modification to operate when technology is upgraded.</p> <p><i>This concept implies future proofing of technology and while it may be difficult to obtain, this will be considered during the design and development phase of the eLearning solution.</i></p>
Accessibility	<p>Content can be identified and located when needed to meet training requirements.</p> <p><i>While the SCORM manifest contains information describing the content, discovery of this content is largely a function of the LMS.</i></p>

Lesson level SCOs may represent:	
A single terminal performance or enabling objective or concept per lesson SCO.	<p>Though not always practical, a single terminal or enabling objective per lesson is preferred. This level of SCO would include an assessment and completion tracking criteria for the objective.</p> <p>When titling SCOs at this level, include the action statement of the learning objective contained within the SCO.</p> <p>As our LMS does not support SCORM 2004 sequencing, this level of packaging is not practical for lessons that offer “testing out” of individual sections.</p>
An aggregate test of multiple terminal or enabling objectives	<p>An aggregate test or exam can appear as a packaged SCO. This is common for QuestionMark Perception configured assessments.</p>
Multiple terminal performance objectives and enabling objectives	<p>Multiple concepts and objectives can be contained within a single SCO. This level of packaging should only be used when absolutely necessary to support design requirements, as in the testing out of multiple sections.</p>
Optional or untracked elements.	<p>Optional or untracked elements containing non-instructional content may be packaged as SCOs. For example, a series introduction that doesn't include a terminal or enabling objective may be packaged as in optional introductory SCO.</p> <p>Optional or transitional elements are considered single-use.</p>

SCOs cannot link to other SCOs or access data elements associated with another SCO. A SCO session is launched, initialized and closed within the scope of the SCO and a data sandbox is maintained for each individual SCO and student session. When practical, a SCO will be sized at the lesson level and will track a completion score that measures a single terminal performance objective or a single concept per lesson. Lesson level sizing allows for flexible curriculum support through reuse, recombination, and blended learning opportunities.

When possible, SCOs shall exclude references to specific ratings, skill levels, or hierarchical descriptions (course, phase, module, lesson, etc..)

A SCO is a collection of assets that becomes an independent, defined piece of instructional material. The granularity and composition of a SCO may vary from project to project and may depend on the type of instructional materials. As a rule of thumb, a SCO is the smallest logical unit of instruction you can deliver and track via a learning management system (LMS).

Use the worksheet on the next page to identify the course structure and designate features and requirements for each SCORM element.

- **Dependency** indicates whether a course can stand on its own (independent) without contextual dependency on another component or whether the element requires other content structures to make sense (dependent).
- **Attempt Limit** indicates that the learner has limited attempts.
- **Post-Test Limit** indicates that the learner is limited in post-test attempts.
- **Mastery Score** indicates the minimum passing score for the lesson SCO.
- **Tracked** indicates that the lesson SCO completion is tracked.

Worksheet: SCORM Lessons

Element Title	Dependency	Attempt Limit	Post-Test Limit?	Mastery Score	Tracked / Required?
<i>Adjust the flux capacitor</i>	<i>Independent</i>	<i>NA</i>	<i>NA</i>	<i>90%</i>	<i>Yes</i>

Use this worksheet to document strategies for SCORM structure.

See the MS Word Worksheets for a functional example.

IX. Design Process Deliverables

The intent and delivery requirements for each process deliverable document are listed below. See the end of the section for samples of each of these documents.

Statement of Work

The statement of work should be constructed based on the outputs of analysis and pre-design analysis. The statement of work considers the performance and business goals and defines all tasks that will be addressed by the solution. The statement of work also defines all work to be performed, requirements, and guidelines.

Each project will vary. However, the table below defines the content areas that must be included. Further information can be found in COMDTINST M4200.19e, Guidance for Contracting Personnel, or the Federal Acquisition Regulations (FAR).

Table: Statement of Work Requirements

Background	Provides an overview of the problem to be solved by the contracted effort and the desired outcome. This includes relevant background information and a brief description of the target audience, if applicable.
General Task and Deliverable Description	A brief high level narrative describing the work to be accomplished under the contract.
Detailed Summary and Scope of Tasks and Deliverables	Defines distinct deliverables and acceptance criteria for each task increment. The scope of tasks must clearly illustrate the level of effort for each task.
Performance Period and Schedule	Defines the expected delivery schedule.
Travel Requirements	Defines expected travel.

Security Requirements	Defines information sensitivity and classification requirements.
Technical Requirements	Defines technical delivery requirements.
GFE / GFI	Defines government furnished equipment, materials, and information resources including SME support.

Project Plan

The project plan provides an execution framework for the entire project effort. This plan documents the schedule and work breakdown structure (WBS) as well as the assigned personnel, approach, quality assurance plan, and risk management plan.

Table: Project Plan Requirements

Overview	Establishes the project name, start date, date awarded, contractor, current stage and scope of the project.
Personnel	Defines all personnel roles and responsibilities. This lists all roles and points of contact for both the service provider and the customer.
Deliverables	Lists all task deliverables. This includes the deliverable name, start and end dates, and the POC for the deliverable.
Milestones and Schedule (WBS)	Defines all project phases and activities within each phase. This includes the number of days for the activity, start dates, dependencies, and milestones. <i>Also known as the POAM.</i>
	Diagrams and descriptions of project phases to illustrate the project plan. These may include GANTT Charts and PERT Charts.

Cost Breakdown	Quantifies the budgeted and actual hours, and estimated hours to complete each activity in the work breakdown structure.
Risk Management	Identifies potential risks, designates a risk probability and impact, and provides the planned approach for mitigating the risk.
Quality Management	Designates the person responsible for quality activities including quality testing and recordkeeping. Preferred formats and processes for discrepancy reporting should be indicated in the quality management section.
Expected Travel	Defines budgeted travel as well as anticipated travel cutoff dates.
Progress and Status Reports	Defines progress and status report frequency and feedback expectations.
References	Provides references to GFI and project relevant resources.

Project plans estimate what will happen. There may be variations from the plan during execution. ADL Project Officers must determine if the variances are acceptable, notify project stakeholders, and adjust the schedule accordingly.

Curriculum Outline

The curriculum outline is a Coast Guard internal process requirement. This requirement must be completed prior to deployment of the solution and will be completed by internal staff. A complete curriculum outline will include a course code. This tracking number is assigned by FORCECOM and must be requested early in the process.

See Training System SOP 6: Curriculum Outlines for curriculum outline guidance. An example of a Self-Paced eLearning Curriculum Outline is also provided at the end of this section.

Course Code Request

A course code is required to complete the curriculum outline and deploy the course. Course code requests are submitted to FC-Tms using form HQS-FC513-A and C School Change Request, located in Outlook forms on the SWIII. The course code request must be submitted early in the design phase to ensure receipt before deployment.

Design Document

The design document represents assumptions of goals, objectives, instructional strategies, types of training materials, and evaluation methods. This document defines assumptions that drive all components of the ADL solution, including learning content, sequencing strategies, and navigation. The work to build out a detailed design and design flow has not yet begun. The design document captures assumptions and provides a small increment for review and, if necessary, course correction before the scope of effort grows.

Table: Design Document Requirements

Solution Description	Establishes a context for the solution. This may describe the problem that the solution is solving and the context in which it will be solved.
Training Requirements and Objectives	Training requirements and outcomes identified by the analysis and pre-design analysis represented as goals and objectives.
Task List	A complete list of performance tasks associated with the solution should be identified by the analysis and validated by the pre-design analysis.
Design Approach	Outlines instructional strategies, media assumptions, types of materials, and assessment methods.
Outstanding Questions	Any outstanding unanswered questions should be posed in the first draft of the design document.

Assessment Plan

The assessment plan defines the strategy for all projected test items. As an artifact tightly coupled with the performance objectives, this plan shall be delivered before the completion of the storyboards. The test items may change over the course of the design. The test item strategy will not change unless the objectives change.

Table: Assessment Plan Requirements

Assessment Strategy	Summarizes the overall assessment strategy.
Package Assumptions	Summarizes assumptions related to the packaging of the assessment. This may include designation of a pre and post test, deployment considerations (QuestionMark™ Perception), and packaging types (internal to the SCO or separate).
Objective Strategy Map	A table or map that provides correlation between the terminal performance and enabling objectives and assessment strategies for each objective.
Test Items	Whenever possible, test items will be included in the assessment plan. In cases where this is not practical, reasoning must be provided.
Special Considerations	Indicates special considerations for the test. This might include safety factors related to specific tasks that may influence cut-score decisions.

Design Flow

The design flow extends the assumptions established in the design document and provides a high level mapping of specific elements in the solution. The Design Flow can take many forms including an outline or flowchart. A flowchart is preferred.

The design flow provides a top-level organizer to guide the development of storyboards and provides an orientation guide or map for storyboard reviewers. The design flow can also be used to convey complex instructional flows to the developer.

Table: Design Flow Requirements

Simple	The format selected shall be simple enough to communicate the structure to a person without eLearning design experience.
Represents Segments and Strategy	The design flow typically does not show individual screens. Instead, it represents segments (learning steps / activities) of a lesson. This shows just enough detail to depict the overall flow of a learning activity within the structure.
Represents Features	Does not indicate all specific menus, feedback, remediation, or help screens but may provide an example that represents how these will be handled. May also indicate which features will always be available to the learner (help, glossary, etc.).

The design flow is helpful both as an incremental deliverable and as a map to orient subject matter experts and reviewers to storyboards and development increments.

Functional Prototype

The functional prototype couples a small technical component delivery with an example storyboard that correlates to the production. The functional prototype is an example of the lesson packaging for one topic that illustrates:

- All user, screen design, and media conventions
- Training / branching and remediation / reinforcement strategies
- Learner control features
- Anticipated learning activity types and treatments
- Recordkeeping, bookmarking, and tracking features
- Narrators and other audio features

The functional prototype serves multiple purposes and must be delivered before the storyboard delivery. This provides several benefits including:

- An opportunity to test a small, yet relevant, component in the deployed environment prior to heavy design or development begins. This can reveal problems with the delivery that are easier to fix before the whole product is designed and developed;

- An opportunity for the customer to see the concept of the solution and quality of development output. This can help to realign the client and the service provider before significant effort has been expended, and;
- An opportunity to present a small section of storyboards that correlate to a production output. Feedback on storyboard delivery can help to shape the level of elaboration to best meet the needs of the reviewing audience.

Table: Functional Prototype Requirements

Selection of Topic	The selection of the section provided by the prototype shall be approved before prototype development. The prototype is not a throw away deliverable. The deliverable shall be usable as part of future project design and development deliverables.
Storyboard	The prototype storyboard shall be delivered with the functional prototype in a polished state. The storyboard shall elaborate the prototype functionality and content at the same level the storyboards intended for the whole product.
Prototype Content & Function	<p>The prototype content shall be delivered in accordance with the technical requirements, the requirements presented in this appendix, and any additional requirements established in the performance work statement.</p> <p>The prototype will be evaluated using the acceptance testing criteria listed in section XI of this appendix.</p>

Storyboards and Scripts

Storyboards are the planning document used to develop the screen presentations, activities, and supporting materials for the solution. These documents provide a review opportunity for stakeholders and subject matter experts before development begins.

Unless other formats are approved ahead of time, storyboards shall be delivered in a Microsoft Word format.

Storyboards and scripts provide explicit descriptions of all content and activities. These planning elements define how every facet of the solution will function, how it will look, and specifically defines the experience, content, and message for each topic, lesson, and module.

Table: Storyboard Requirements

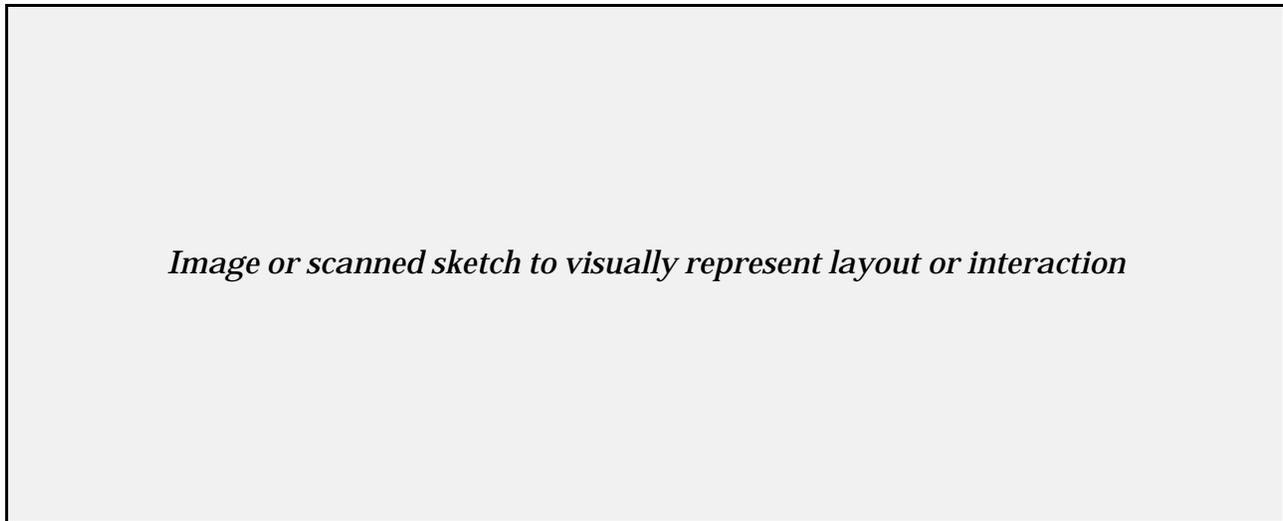
<p>Storyboard format is appropriate for the review audience.</p>	<p>Subject matter experts comprise the primary review audience for most eLearning solutions. Confusing or crowded formats can be difficult to review and may lead to quality problems and long turn-around times.</p> <p>As a general rule, fields that are irrelevant to the reviewer should be excluded from the format, hidden from reviewers, or minimized. Irrelevant fields may include programming notes, internal file names, and redundant fields.</p>
<p>Storyboards extend the design document and content flow.</p>	<p>The storyboards are a granular representation of the learning experience. The design document defines the solution in general terms. The content flow maps the elements of the experience and may be documented in a flowchart or outline. This higher level representation is generally easier to review for structure and helps to orient reviewers to the structure of the solution.</p> <p>The storyboards should match the approved learning experience flow. If the storyboards do not match this flow, a new flow should accompany the storyboard delivery.</p>

Instructional Considerations	
Performance and Cognitive Load is appropriate.	Consideration of cognitive load tends to limit the number of elements represented at one time or within a span of time. This also provides a principled framework for aesthetics and visual appeal.
Segment size is appropriate.	Each storyboard should represent a single managed view of a single concept or topic. Jamming information into a single screen violates the principle of cognitive load.
Storyboard contents map to a stated objective.	Storyboards shall be indicated in an objective mapping table at the beginning of the storyboard document.
Storyboard contents are relevant to the audience.	It's easy to get carried away with nice-to-know information when writing storyboards. Validate the relevance to the audience when adding information to a storyboard.
Storyboard describes active forms of learning.	Reading and listening is passive. Meaningful learning activities encourage learning through interactivity. Problem solving is learned by solving problems, decision making is learned by making decisions.

Simple Storyboard Example

The format of a storyboard or script can vary by the type of solution. A video script may look significantly different than a screen-based storyboard.

Section	Section Title		
Title	Screen Title	Screen	1-01



On-Screen	Narrative / Audio
<p>Description of screen text, graphical, and interaction elements.</p> <p>[images can be described inline with narrative on the right to indicate presentation sequence]</p> <p>[interactions can also be described using inline action brackets]</p>	<p>Narrative or audio description.</p> <p>For the rough delivery of the storyboards, this may comprise a rolling narrative describing the content, features, and voice of the screen. In polished and final versions this may become the narration script / transcript.</p> <p>Notice that programming instructions have not been included in the SME reviewed boards. Keep the storyboard format simple.</p>

Prompt	Activity or navigation instructions.
--------	--------------------------------------

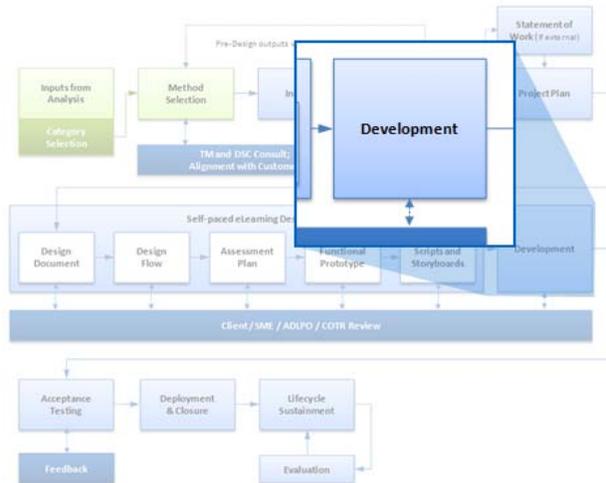
Discrepancy Reports

Deliverable flaws shall be documented using the evaluation rubric /checklist for the delivery, or the general discrepancy report form when a rubric or checklist are unavailable, not applicable, or incapable of capturing the necessary details. Discrepancy reports may be delivered using the standard format shown at the end of this section or any method approved by the ADLPO (Excel document, etc.)

Discrepancy reports contain:	
Location Reference	Where in the product does the problem appear? Example: <i>Storyboard number</i>
Problem Description	What went wrong?
Expectation	What did you expect to happen? (if applicable)
	What would meet your expectations or fix the problem?

To prevent excessive iterations between the client and the service provider, a Quality Assurance responsibility is defined in the Project Plan. It is critical that design and development staffs leverage a **Second Set of Eyes (SSE)** for a critical review of each deliverable before it reaches the customer.

X. Development



Carefully constructed plans begin to come together in the development phase. A well defined design deliverable is critical to a quality development effort. Development effort expended before approval of design deliverables is considered “at risk”.

Development specialists must be involved in the design phase. Designs thrown “over-the-wall” to development staffs will suffer. Likewise, it is critical to involve design staffs throughout development.

Development processes may vary by the product type. Keep these factors in mind during development:

1	Technical requirements are defined in Appendix D. Additional requirements are set out in this section.
2	Templates are loosely defined with guidelines that will be followed unless there is a documented and approved reason to do otherwise.
3	Professional services are expected for contracted deliverables. The definition of professional services and the determination of quality outputs are determined by the customer. When in doubt, ask for incremental feedback at short intervals to confirm satisfaction and reduce risks. Development outputs rejected due to documented dissatisfaction are the responsibility of the service provider regardless of effort expended.
4	In addition to Rough, Polished, and Final outputs the government requires self-assessment and testing for functional / technical and accessibility compliance. The following reports are required for acceptance: <ul style="list-style-type: none"> • SCORM Test Logs indicating that the course meets SCORM conformance • Accessibility Testing Report indicating the course meets Section 508 Compliance in accordance with Section 508 Accessibility Requirements. • Media Inventory that clearly indicates copyright and licensing issues.
5	Acceptance Testing criteria are listed in Section XI. Acceptance Testing . Developers should familiarize themselves with these criteria to minimize iterations.

Development Support Tiers

To provide consistent support across the organization, development capability is defined in two categories. The table below describes each development support tier.

Tier One	Tier Two
<p>Basic Development</p> <p>Provides outputs that leverage entry-level and rapid development toolsets including tools widely available on the SWIII.</p> <p>Development tools in the first tier of development support include Articulate®, Captivate®, and any tools available on the SWIII.</p> <p>Provides graphic and video acquisition using inexpensive consumer level tools.</p> <p>May not be a full time developer or media specialist.</p>	<p>Advanced Development</p> <p>Provides code level debugging and optimization. Can help to resolve SCORM / Learning Management System (LMS) integration issues.</p> <p>Develops using higher end and specialty toolsets like 3D Studio Max®, Flash™, and Authorware®.</p> <p>This development tier also adds advanced development capability and configuration using tools available at the first tier of development support.</p> <p>Normally a dedicated developer or media specialist.</p>
<p>Lectora® is considered a Tier one and Tier two development toolset. This tool offers a relatively low point of entry (easy to use) but may pose challenges for new or part time developers (difficult to master). A Tier two consultant can help developers make the best of the features of Lectora®.</p>	

This two tier system has been put into place to ensure contracted development of Self-Paced eLearning is sustainable. This system also provides advanced support, through a network of experienced developers, to less experienced developers or those without the time to spend working out deployment issues. Contact the ADL Program Office or the Performance Technology Center to access the Tier 2 support network.

Technical Requirements

SOP 7, Appendix D: Common Technical Requirements provides a detailed description of the core technical requirements for deployment of technology solutions in the Coast Guard environment. Specific requirements listed in the tables below extend these core requirements.

Content Package Types and Destinations	
ALL	<p>The following additional requirements apply to ALL packages:</p> <ul style="list-style-type: none">• Courses within the same series shall present a consistent user experience including packaging, interface, and presentation styles.
SCORM (LMS)	<p>The following additional requirements apply to SCORM packages:</p> <ul style="list-style-type: none">• SCORM packages shall be compliant with SCORM version 1.2.• Packages shall be tested prior to submission for review. Test logs shall accompany each SCORM submission. <p><i>See the SCORM Requirements and Features section for specific functionality requirements.</i></p>

The Coast Guard environment can present challenges to successful deployment of technology based content. Consideration must be given to the lowest common denominator in the chain of technologies that comprise the Coast Guard IT infrastructure. Communication with each level of stakeholders and knowing your audience is critical to successful technology design decisions.

Formats and Packaging Options

Self-Paced eLearning can manifest in many forms. The most common form is the slide-based presentation format. The format selected will depend on the audience requirements and the types of activities included in the solution.

Format Examples	
Slide-based presentation	Typically produced by toolsets like Lectora® and Articulate®, this format presents individual slides in a linear or branched navigation format. The dimensions of this format are typically fixed but can vary based on the presentation requirements.
Single or multiple page documents	Typically produced using EPSS development tools or HTML editors, this format presents a page of organized content similar to a Web page. The dimensions of this format are fluid. This format can be useful for accessible outputs.
Isolated Media	This format presents media such as video and individual interactions outside of the context of a courseware shell. This format can be useful for tutorial components, podcasts, and brief interactions.

Production Structures and File Naming

Production structures shall be consistent and well organized.

The construction of production and planning structures may vary from project to project and developer to developer. To gain consistency in expectations and ease of discovery, these baseline folder construction guidelines should be considered for all projects. These boilerplate rules for construction, distribution, and organization of production file structures will help the organization maintain consistency and predictability:

- Keep the most important elements at the base of the folder structure. Don't bury artifacts like alignment agreements, curriculum outlines, and delivery agreements within the folder structure.
- Don't add unnecessary folder or file structure.
- Separate planning artifacts from production artifacts.
- Separate production source from published outputs.

The structure suggested below meets each of these rules:

- Project (folder)
 - Files at the root of the project folder
 - Planning (folder)
 - Planning documents (storyboards, outlines, discrepancy reports)
 - Production (folder)
 - Lectora
 - Robohelp
 - Flash
 - Fireworks
 - Audio
 - Video
 - Published (folder)
 - Web (folder)
 - LMS (folder)

Keep project folder naming short and simple. Once delivered, the project folder should be suffixed with a date for easy identification of age and origin. *For example: projectshortname_2011aug.*

Multiple versions of source materials may be maintained locally during development. However, both contracted deliverables and final source archives shall contain a single source artifact for each media element.

The following rules apply to file names for source materials and published outputs:

- Use lowercase characters
- Don't use spaces
- Uses a coding schema familiar to the team
- Clearly describes location or context

Anatomy of a good file / folder name

Notice that these examples all use lower case characters and don't use spaces!

A project type makes a handy sort field (ps, el, etc.)



20100525_ps_cpb_ows

The date format makes it easy to sort from a single directory. A date may be included as a prefix or suffix.

Clearly name the project.

Notice how all of these examples use less than 20 characters?

You may also need to include course code identifier



20100525_el_80001_abcd

This is the date of start or actual completion, whichever is later.

Abbreviations and acronyms are ok as long as everyone knows what it means

For EPSS Outputs

Create a coding scheme that the team understands



ro_complete_pump.jpg

Organize photographs and media in folders and with names that describe context and provide sufficient detail for sorting and discovery.

For eLearning Outputs



s0_a1.fl

This is a source file. Make sure it's **not mixed** in with exported / compiled final build files.

A storyboard id tells you where it goes.

Here are a couple of example that use version suffixes:

20100431_cg_acq_careerpath_final.doc

20100431_cg_acq_careerpath_v03.doc

Notice how the 3 is led with a zero (this helps with sorting!)

Internal Production States

Internal production teams will use a structured build and storage practice to ensure consistent configuration management and prevent data loss. The table below defines four production states. Use these production states when moving production artifacts through the lifecycle. The Solution Lifecycle Manager for the solution must be notified whenever the production archive for a course is moved.

Artifacts are:		And are stored:
In production	Cooking	In a production location with regular backups.
Delivered (1 year from delivery)	Hot	In a project folder with regular backups.
Delivered (1-3 years since last change)	Warm	Zipped in an archive within a project folder with regular backups.
Delivered (>3 years since last change)	Cold	Zipped and either kept in the project folder or moved to a safe offline storage archive.
Reusable Source media elements (visuals, video, 3D models, interactions) with potential common uses.		Copied to a media share at the production location. Reusable files should be organized for easy locating when a query is requested by the development community.

- Outputs created on standalone systems shall be committed to a safe, backed up location **weekly**.
- Outputs created and stored on external portable drives shall be committed to a safe, backed up location **daily**.

Styles and Navigation Templates

Navigation, interface, template sets, and presentation styles shall support the effective packaging of the instructional strategy as outlined in the design document and storyboards.

The use of templates provides a means for rapid development and deployment of eLearning products. Templates commonly include navigation controls, eliminating the need to create a new template for each product. Many templates also provide functional frameworks for the LMS environment. Additionally, some templates can provide standard style and formatting elements, requiring only the addition of content to launch a functional course.

These requirements apply to Self-Paced eLearning templates and interfaces:	
Consistency	<p><i>A learner can be distracted by inconsistencies.</i></p> <p>Screen conventions, fonts, color schemes, presentation aesthetic, window dimensions, and location and construction of navigation controls shall be consistent within a product and product series.</p>
Usability	<p><i>Don't frustrate the learner.</i></p> <p>Navigation and presentation elements shall be usable by the target population. Users should not have to spend energy orienting to the navigation controls while engaged in a Self-Paced eLearning experience. Consistent use of navigation controls and orientation aids provide a consistently usable experience.</p>
Responsiveness	<p><i>The absence of feedback or responsiveness in navigation can detract from the learning experience.</i></p> <p>Interface and template elements shall provide feedback appropriate to the navigation context, like a visual state change.</p>
Window Management	<p><i>"Popup" windows should be avoided.</i></p> <p>While not always practical, this guideline is particularly important for addresses outside the domain of the course. Child windows can be confusing to the user and, in some cases, can cause SCORM communication problems. Linking to content outside the LMS domain creates span-of-control issues that can result in broken links.</p>

Template and interface styles support the needs of the audience and performance requirements. A good template provides the framework for a consistent experience that places the learning experience front and center. This principle establishes a navigation shell and trim that yields to the content presentation and activities, vice providing a decorative distraction that outshines or overpowers the presentation.

While this appendix will not dictate extensive templates and interface requirements, several guidelines and a default template definition is provided as a starting point.

Interface Default Template

This section describes the features and benefits of the default template. This template should help to resolve interface design decisions, reduce unnecessary interface decoration, and is available in multiple template formats including Flash™ (presentation sequence player), Lectora®, and Articulate®.

Self-Paced eLearning solutions will use the default template or similar layout unless sufficient rationale can be provided for alternate packaging. In any case, button locations and labels will be consistent with the default template.

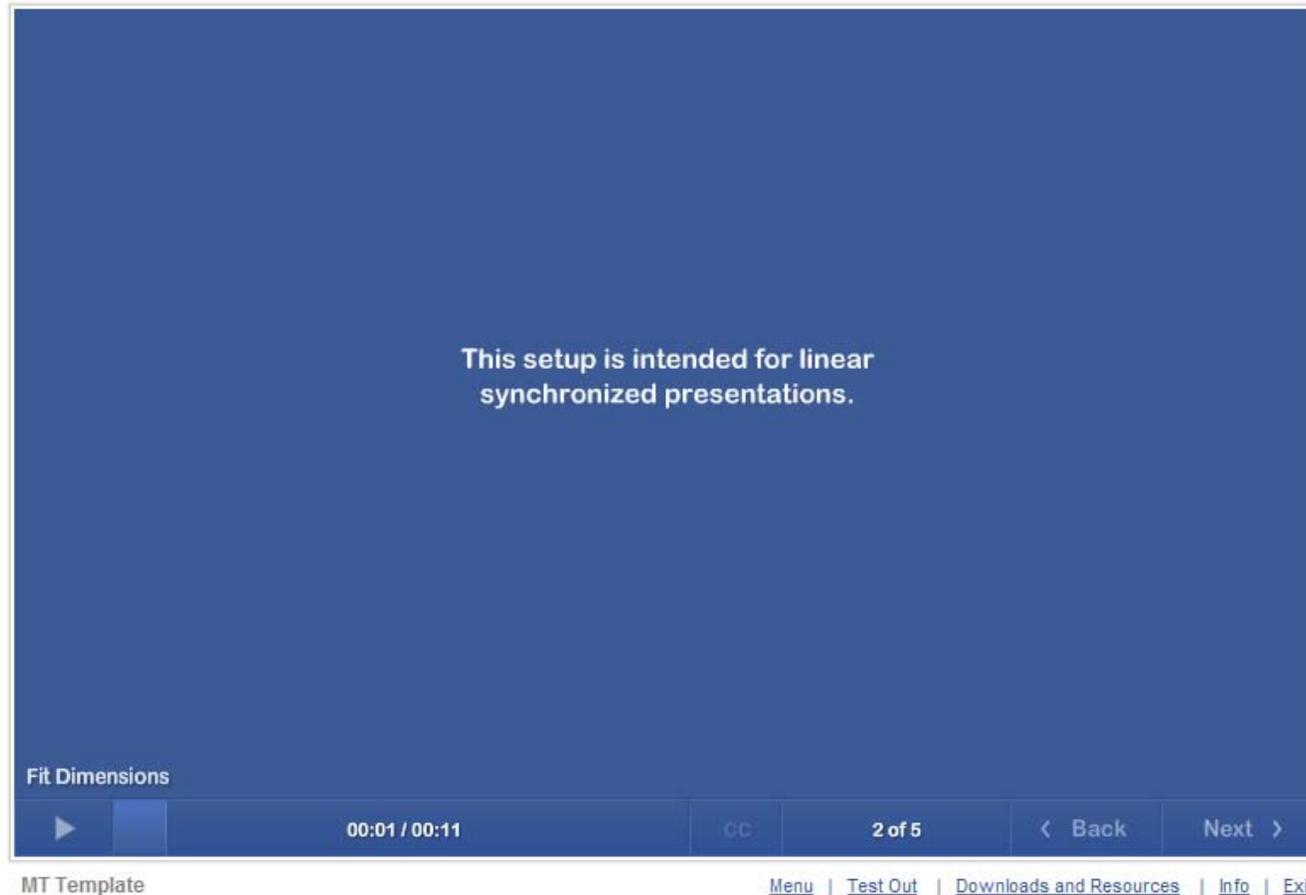


The default template was originally designed to support the Mandated Training series and has become the default template. The template maximizes the area for activities and establishes a clear and consistent navigation shell that yields to the presentation area.

The presentation or activity area is the centerpiece of this template and can contain a variety of different types of visuals and interactions from standard text and image based presentation elements to task simulations. The template is scalable to accommodate practically any width or height of presentation display (within the constraints of the technical requirements).

The template accounts for most common interface affordances including linear navigation through Back and Next controls, location and progress display, access to closed captioning, and timeline synchronization controls (play, pause, scrub). The template also provides a simplified global navigation control and screen title. A more complete description of the features of the template appears on the next page. Contact your ADLPO for the source template packages and associated style guide.

Default Interface Template Description



← No traditional branded titlebar. The course is branded by:

- The title screen
- The summary
- The context

← The activity / presentation area is the most prominent element onscreen.

← The navigation bar is plain and **undecorated**. Themes in navigation elements are reserved for the activity area. Colors can be adjusted to match the presentation requirement.

↑ The course title also appears as plain text.

↑ A “loader” that also functions as the play bar mechanism is included in the Lectora and Articulate packages.

↑ Global navigation / utility functions appear as plain text links.

Four Principles for Screen Design Choices

The principles in the tables below are common to design and can be used to provide both subjective and objective measurement for design outputs. These principles apply to all facets of the experience including visual elements:

- Contrast
- Repetition
- Alignment
- Proximity

Contrast	<p>If two items (such as a foreground and background element) are not exactly the same, then make these elements different. In order for contrast to be effective, it must be strong.</p> <ul style="list-style-type: none"> • Contrast can help to organize information. Titles, headers, subheads, and paragraph breaks make it easier for a reader to interpret information and create a mental model. • Contrast can help to create a focal point. When combined with strategic alignment and proximity, contrast can help to produce strong focal points. • Contrast can make information easier to see and can be executed by contrasting size, color, font selection, texture, and shapes. <p>Contrast is also a critical component to accessibility and can greatly improve the learning experience for a learner with diminished sight.</p>
Repetition	<p>This principle implies that design aspects are repeated through the entire solution. Repetitive elements include fonts, lines, bullets, colors, design elements, formats, shapes, and spatial relationships. This repetition creates a consistent aesthetic that unifies all parts of a design.</p> <p>Repetition helps to organize, unify, and add visual interest to a presentation.</p>

<p style="text-align: center;">Alignment</p>	<p>Nothing in a presentation should be placed arbitrarily. Each item in a presentation should have a visual connection with something else on the page. Poor consideration of alignment is a leading cause of unpleasant presentations.</p> <p>Centered alignment can create a more formal, sedate, and ordinary look. Centered elements can also be more difficult to connect with other elements that are not centered. Don't center or justify lines of text. Ragged vertical edges make text harder to read. Don't combine flush left and flush right alignment on the same page. Do one or the other.</p> <p>Alignment helps to create visual unity on a page. This unity creates order.</p>
<p style="text-align: center;">Proximity</p>	<p>Group items together so that related items are seen as a cohesive group. Items or elements that are not related should not be placed in close proximity.</p> <p>If there are more than three to five items on a screen, try to separate items into groups to create visual units. Use white space to clearly announce visual units.</p> <p>Don't fill the corners or edge of the screen. The edges of the screen border are an element. Close placement of elements to the edges reduces focus.</p> <p>Organize elements in a natural flow. Don't require the learner's eye to jump from one part of the screen to another.</p>

Additional information on principles of design can be found in Rockport Publishing's Universal Principles of Design.

Screen Design Guidelines

The guidelines listed in the table below align with the principles outlined above and are based on the book *Design Elements – A Graphic Style Manual* by Timothy Samara. These guidelines and principles frame good design practice. As each situation is different and may present new challenges and problems to solve, these serve as guidelines unless a requirement is indicated.

Start with a concept	Design begins with a concept that supports a clear goal. Communicate this concept with a clear message.
Be purposeful	Be purposeful or don't do it at all. A purposeful message is clear. The learner will be more likely to be influenced by a decisive design than a design without purpose.
Don't decorate	Decorative forms that aren't right for the message you're communicating will communicate unintended messages.
Speak with a single visual voice	Maintain consistency in the aesthetic and style throughout the lesson.
Chose fonts with purpose	Choose a typeface with specific purpose. Keep font faces used to two or three. <i>Arial, Verdana, and Georgia are safe font choices.</i>
Make type friendly	Type must be legible. Use a size sufficient to provide readability for your audience. <i>Font sizes should generally be larger than 12pt.</i>
Chose colors with purpose	Just as with fonts, choose colors with purpose. Colors convey meaning.
Focus attention and lead	Focus the learner's attention on one thing and lead them through the rest.
Make do with less	Less is more. A presentation or activity is only finished when you can't find anything else to remove.

Negative space is valuable	White space, or negative space calls attention to important elements, separates these elements from unrelated concepts, and provides a resting place for the eye.
Treat type like you would an image	Just as with images, type is a visual element and needs to relate to everything else in the composition.
Meaningful images	Photography is useful. Stock images are useful. But nothing is more banal and meaningless than a commonly used instance of stock imagery or irrelevant photo that doesn't help explain a concept and doesn't add to the conversation between the content and the learner.
Style: Meaning vs. Fashion	Ignore fashion and historic trends in the beginning. Style the project around meaning, not the designer's or audience's expectations of current or past trends.
Use layouts to create interest	Flat and completely consistent layouts fail to offer a sense of movement or spatial interaction. This will negatively impact attention and will contribute to boredom.
Symmetry is strategic	Every design choice should not result in a perfectly symmetrical output. Don't let format drive design. Make design drive format.
Design is not about the designer	It's easy to get lost designing for one's self or designing to show off a technique or skill. Design is problem solving for the user – not for the designer.

Instructions and Help Screens

Help screens and interface tours are a common feature in eLearning courses. Unfortunately, these are often misplaced or provide unnecessary or redundant explanations of navigation features that don't need explanation. The table below outlines a few rules and methods you can use to avoid mistimed and unnecessary explanation. These guidelines apply to global, local, and activity level interactions and interface elements.

Use conventional navigation controls	Use conventional navigation elements with common meaning. Next, Back, Play, Pause... These controls and the metaphors associated with these common elements all have easily interpreted meaning.
Consider not adding an interface tour	If the basic functions of your interface are self-evident or are easily discoverable through trial and error, consider not including instructions.
Make the tour optional	If you have to use a tutorial, make it optional. A navigation tutorial can be a real buzz kill to the lesson flow if you've already gotten the learner's attention. If you do make this an optional activity, provide access to the help up front or make the help tutorial accessible any time.
Only explain the unconventional elements	Explain unconventional elements or advanced controls in your tour and leave out the obvious elements.
Provide "just-in-time" instruction	When an interface convention is introduced for the first time, you may want to clearly identify how the user should proceed and / or offer optional contextual help on the screen where the new convention appears.
Rethink the complex	If visual elements for content navigation and operation of the course or activity are not self-explanatory or require extensive instruction to use, rethink the design of these elements.

When to Use ADL Infrastructure Tools

The ADL Program Office manages several tools that may be useful when you're considering options for deployment of assessments and surveys, or need to conduct group interviews during an analysis.

<p>QuestionMark Perception</p>	<p><i>QuestionMark™ Perception is an option for centralized assessment management.</i></p> <p>QuestionMark™ Perception is a hosted application specifically designed for developing, deploying, and managing assessments online. Additional access and development requirements apply to the development of QuestionMark assessments. See the USCG Training System SOP: E-Testing Via QuestionMark Perception for specific access and operating guidelines.</p> <p>The deployment environment and tools used to deliver an assessment will depend on the scale and nature of your examination requirements, as well as your reporting and analytics requirements.</p>	
	<p>If your test...</p> <ul style="list-style-type: none"> • Is an end of lesson quiz or other small assessment. • Doesn't require enhanced analytics or reporting. • Tailors the course presentation based on the test score. 	<p>Consider building your test, quiz or assessment into a SCO that does not leverage QuestionMark.</p>
	<p>If your test...</p> <ul style="list-style-type: none"> • Is a large examination that leverages more than 50 questions in a question pool? • Requires enhanced reporting and analytics. • Requires access controls. • Stands alone and doesn't necessarily require other courseware components. 	<p>Consider building your assessment into a SCO that leverages the features of the QuestionMark system.</p>

<p>Vovici Surveys</p>	<p><i>Vovici EFM Surveys can be used to deploy level-one surveys.</i></p> <p>Vovici is a hosted survey application. Contact your ADLPO to inquire about access to the Vovici system.</p>
<p>Group Systems ThinkTank</p>	<p><i>ThinkTank can be used to run collaborative brainstorming and analysis sessions.</i></p> <p>ThinkTank is a hosted application. Contact the ADL Program Office to inquire about access to ThinkTank.</p>

This list of specific brands does not imply endorsement of the tools by the USCG. The list is current as of August 2011 and is subject to change.

SCORM Requirements and Features

The crucial link of communication between a Self-Paced eLearning product and the LMS is Sharable Content Object Reference Model (SCORM). The protocols established by this interoperability standard provide the means for the content to “talk” to the LMS and the LMS to “talk” to the content.

NOTE: SCORM courses typically cannot be run outside of an LMS environment without producing errors.

Courses intended for deployment on the Coast Guard LMS shall be delivered in SCORM 1.2 conformant packages. AICC packages are not supported.

Regardless of design or authoring tools used to develop a product, a SCORM course needs to communicate with the LMS using a JavaScript API. Products loaded in the current LMS (Inquisiq R3) must be SCORM 1.2 conformant. The current LMS supports some features of SCORM 2004. However, these features are largely untested and the developer may encounter problems with some protocols. SCORM 2004 content sequencing is not supported as of August 2011.

Required SCORM Features	
Bookmarking	Lessons will resume from the last accessed location. (lesson_location)
Completion Tracking	Lessons will track and submit completion. Lessons will not rely on score / mastery score to calculate completion. (lesson_status)
Score	Lessons will submit a score when a test is included in the design. When multiple tests are included, the post-test or mastery test score will be submitted. (score.raw)
Activity State	Lessons will recognize the activity completion state for complex activities. Learners will not need to complete activities upon re-entry if they have already successfully completed these activities. Variables are typically handled by the authoring package.

SCO Packaging

Publishing a completed course from most development tools will typically publish a ZIP package that includes all necessary files. Package multiple SCOs into a single ZIP file when they are part of the same course. It is normally simpler to upload a single file containing multiple SCOs than multiple files.

[See the design section for SCO and lesson structure guidelines.](#)

SCORM Keywords

While much of the functionality of SCORM is relatively transparent to a developer that employs authoring tools, there are crucial keywords that trigger various events depending upon the learning management system. The tables below describe these functions and their keyword parameters. Unless otherwise noted, values listed in this table are case-sensitive.

Common Keywords		
cmi.core.lesson_location	Stores the current location. Functions as the bookmark for the course.	Read / Write
cmi.core.lesson_status	Stores the status of the lesson.	<ul style="list-style-type: none"> completed incomplete

The following data model elements are presented to provide a sense of the communication features provided between the LMS and the lesson. The authoring environment typically handles the storage and retrieval of data elements.

Data Model Element	Use	Value Notes
cmi.core.student_name	Retrieves the student name from the LMS.	Read only
cmi.score.raw	Stores the learner's performance relative to the range bounded by the values of min and max.	Read / Write
cmi.core.entry	Indicates whether the learner has previously accessed the SCO.	Read only
cmi.core.total_time	Indicates the sum of all of the learner's session times for this lesson.	Read only
cmi.suspend_data	Provides a space to store and retrieve data between learner sessions. Normally used to restore activity state.	Read / Write. SCORM 1.2 specifies minimum 4k field size, Inquisiq field size 64k.
cmi.comments	Comments or notes from the learner about the SCO	Read / Write. Retrieval requires reporting access.
cmi.objectives.n...	Provides a data element for granular objective level scoring.	
cmi.interactions.n...	Provides a data element for capture of test item interactions or assessments only. Learning checks will not be recorded as interactions.	

Testing Your Course on the Development LMS

Once your course has been developed, the package will need to be tested on the development server prior to acceptance testing. As mentioned in SCORM Requirements and Features, SCORM test logs are required prior to development testing of content packages. The chart below outlines the steps for accessing the development server.

Table: Development LMS Test Procedure

1	Ensure test logs accompany the submission of a SCORM package for development testing.	<p>Test logs can be generated using the ADL Test Suite or using online cloud based LMS debugging tools like those available at http://cloud.scorm.com.</p> <p>As of August 2011, the development server is only available within the CGDN+ network. Test logs are required for vendor submissions.</p>
2	If you have access to the Coast Guard network, submit a request to access the development server. You must have Coast Guard network access to gain access to the LMS Development Site.	<p>Access this page: http://csd.osc.uscg.mil/cghelp/index.htm?app=LMS</p> <p>Fill all contact information and select R3 DEVELOPMENT (LMS) from the Application drop-down field.</p> <p>Indicate the reason you need access to the development server.</p> <p>Submit and wait for a response. If you do not hear back within 48 hours, contact the ADL Program Office.</p>
3	Follow the steps listed in the LMS Development Site Guidebook.	Request this guidebook from your ADLPO or access the guide on the ADL Collaboration Site on CGPortal.

Troubleshooting Common SCORM Issues

SCORM Package Fails to Load	The size limit for using the upload feature is 200Mb. <i>Check the file size of the SCORM package.</i>
	The server could have timed out. <i>Try uploading the SCO again.</i>
	The imsmanifest.xml file MUST be at the root of your zip archive. If the manifest file is missing or your zip package contains another zipped archive, the LMS won't load the package. <i>Unzip your SCORM package and check the location of the imsmanifest file.</i>
	The imsmanifest file could be malformed. <i>If your file was generated by an authoring tool, try republishing. If you hand-coded your imsmanifest, try validating the manifest in a manifest building tool like RELOAD Editor.</i>

SCORM File Names and Storage

Published SCO's (.zip files) are added to the appropriate folder within OSC's fetch repository ([\\fetch.uscg.mil](http://fetch.uscg.mil)). All SCO's must be named using this construction:

- coursecode_refname_date.zip
ex: 810046_efp_28feb11.zip

Old files should be replaced or deleted. Only one instance of a SCO should be present in the fetch repository.

Section 508 Accessibility Requirements

Developers shall develop universally accessible solutions. Activities may require the application of skills and abilities required by the real world activity.

Government agencies providing services and information through any channel are obligated to provide universal access to all citizens and employees. Policy, checklists, and guidelines exist at the agency level and shall be followed. This section defines a model for practice that provides usability while considering the task being trained.

Universally Accessible	Provides a positive experience and complete access to information regardless of the physical abilities of the user.
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Principles of universal access apply to all ADL products. Much of the discussion surrounding accessibility is focused on narrow cases. This relegates Section 508 compliance testing to “works in a screen reader” or “is closed captioned”. While these features are important, this narrow focus ignores a larger audience with disabilities that include color blindness, partial vision, motor control and learning disabilities. This focus can also lead to unnecessary compromises in the design of the experience.

42 U.S.C. § 12182(b)(2)(A)(iii)

*(iii) a failure to take such steps as may be necessary to ensure that no individual with a disability is excluded, denied services, segregated or otherwise treated differently than other individuals because of the absence of auxiliary aids and services, unless the entity can demonstrate that taking such steps would **fundamentally alter the nature of the good, service, facility, privilege, advantage, or accommodation being offered** or would result in an undue burden;*

The law indicates that a person with a disability cannot be excluded or treated differently than a person without the disability. The law also implies that fundamentally altering the nature of the service being offered is considered unacceptable. While we must pursue universal accessibility at each opportunity, we must also consider the task represented in the training product.

If the task requires abilities to perform a task, we must authentically represent these tasks in practice. In other words, making design compromises that alter the authenticity of the performance of a task defeats the purpose of the training tool. In such cases, partial compliance or exclusion from compliance is reasonable; but only for the activities that represent the task. All other elements of the product will be universally accessible.

This model of accessibility is **sensible and considerate**. The key to providing a sensible level of support for universal accessibility is in determining the performance requirements for the task being trained. For example, if a task requires sight or hearing

to perform, this activity will not, necessarily, provide an authentically accessible alternative. However, the solution **will** let the disabled user know that the specific task and associated activity require these abilities. The solution **will also** provide the opportunity to skip the activity. This is the considerate component of the model. This provides a best of both worlds experience for all users without making inauthentic compromises or confusing impaired users. This model for construction provides a clear set of principles that make products work for everyone, every time and should eliminate waiver requests. This does not provide an excuse to make technology choices that make accessibility difficult. Nor does it provide permission for developers to avoid accessibility all together.

Follow the steps below to determine the level of accessibility. There are only two levels. Universally accessible is the first and default consideration. Authentically accessible is the other and only applies to the emulation of tasks in specific activities that would require abilities to perform the task.

1	Assume all product features and presentation materials are universally accessible.
2	<p>Review the Task Requirements field on the Objectives Mapping Worksheet for any specific ability requirements.</p> <ul style="list-style-type: none"> • If no specific ability requirements are indicated, the activity must be universally accessible. • If specific ability requirements are indicated, the activity may be authentically created. However, the presentation must provide a clear indication to a disabled user that the activity requires these abilities with instructions and affordances for continuing.

The table below describes methods for making information and training universally accessible. See the accessibility checklist in Section XI. Acceptance testing for accessibility testing requirements.

Table: Methods for Universal Accessibility

Global Considerations	<ul style="list-style-type: none"> • Be consistent • Don't convey meaning with color alone • Maintain contrast between foreground and background • Use multimedia with care • Use flexible layouts
Navigation	<ul style="list-style-type: none"> • Provide keyboard operated controls and clear accessible labels. • Make links meaningful • Allow the user to easily bypass information • Create a logical tab order through the page

Content	<ul style="list-style-type: none"> • Avoid the use of frames • Use style sheets to control formatting and layout • Avoid pop-up windows • Avoid pages that auto-refresh or redirect • Leverage document structure (headings) to prioritize and organize information. • Use clear and simple language • Create a logical tab order
HTML Code	<ul style="list-style-type: none"> • Construct proper headings • Define list items properly • Use structural markup properly • Use relative font sizing
Video / Audio	<ul style="list-style-type: none"> • Do not start video or audio automatically. The screen reader should not need to compete with audio narration. • Provide keyboard operated controls and clear accessible labels. • Provide a transcript for audio. Provide closed captioning for video.
Images	<ul style="list-style-type: none"> • Provide descriptions for all visuals. • Complex images such as charts, diagrams and graphs need more description than simple alternative text can reasonably display.
PDF and Documents	<ul style="list-style-type: none"> • Accessible HTML will almost always be more accessible than PDF or Word documents. When possible, build documents in HTML format rather than PDF or Word format. • Use the Acrobat Pro validation controls to check for accessibility problems. • Set the document zoom greater than 100% when saving.

XI. Acceptance Testing

The following tests are required prior to acceptance. Contract service providers should familiarize themselves with these testing requirements to minimize iterations of submission. *See the acceptance testing checklist for a complete list of factors.*

Design Testing

Design testing will at the early stages of the project. The visual and assembly design evaluation can only be completed once development is completed. Design testing examines these factors:

- Performance focus
- Organization and Instructional Design
- Content accuracy
- Copyright evaluation

Content accuracy is tested by matching the final product to the approved storyboards. Accuracy of the content, contained in the design flow and storyboards, will be validated and approved by Subject Matter Experts designated by the Project Sponsor before the product entered the development phase.

Technical Testing

Technical testing evaluates technical compatibility and function. The following elements will be evaluated during technical testing:

- Runtime Functionality
 - Does the product meet functionality requirements?
 - Does the product load to the LMS and trigger completion?
 - Do screens load in a reasonable time and provide load feedback?
 - Do all features work?
 - Do all links work?
- Runtime Packaging
 - Is the packaging logical?
 - Does the package contain very large files?
 - Does the package contain redundant or unnecessary files?

The technical test also includes criteria to evaluate the user experience. The following elements will be evaluated during usability testing:

- Clarity of communication
- Logical navigation flow

Accessibility Testing

Accessibility testing evaluates Section 508 compliance. Prior to accessibility testing, the service provider will provide a report of accessibility. This report shall include the methods used for testing compliance and a clear description of any elements that do not completely meet the requirement. Non-compliant elements shall be described with a rationale to defend non-compliance.

Table: Section 508 and WCAG Requirements

#	Compliance Requirement	Benefits	Reference
1	Provide a text equivalent for every non-text element.	Vision impaired.	[1192.22 (b)]
2	Provide a method to skip repetitive navigation links.	Vision impaired.	[1192.22 (o)]
3	Provide synchronized alternatives for multimedia presentations.	Vision / hearing impaired.	[1192.22 (b)]
4	All information conveyed with color shall also be available without color.	Color vision impaired.	[1192.22 (c)]
5	Make text content readable and understandable.	All users, vision and hearing impairments, learning disabilities.	WCAG 3.1.1
6	Documents shall be organized so they are readable without requiring an associated style sheet. Ensure that information, functionality, and structure can be separated from presentation.	All users, vision impairments.	[1192.22 (d)]
7	Make all functionality operable via a keyboard interface.	All users, vision impairments.	WCAG 2.1.1
8	When a timed response is required, the user shall be alerted and given sufficient time to indicate that more time is required.	All users, vision impairment, learning disabilities, mobility impairment.	[1192.22 (p)]

9	Allow users to avoid content that could cause seizures.	Seizure disorders.	[1192.22 (j)]
10	Provide mechanisms to help users find content, orient themselves within it, and navigate through it.	All users, vision impairment, learning disabilities.	WCAG 2.4.1
11	Help users avoid mistakes and make it easy to correct any problems encountered.	All users.	WCAG 2.5.1
12	Make the placement and functionality of content and navigation consistent and predictable.	All users. Vision impairment.	WCAG 3.2.1
13	Use technologies according to specification (<i>product works using assistive technologies</i>).	Vision, hearing, mobility impairments.	WCAG 4.1.1

Efficacy Testing

Efficacy testing evaluates the effectiveness of the solution. This normally requires a controlled user test (Beta test) and requires the design of measurement instruments to provide a baseline and post experience measurement of performance readiness. These instruments may vary but will generally consist of a pre and post-course survey and test.

*In addition to runtime testing, the **source materials** will be reviewed for completeness and structure upon delivery.*

Acceptance Testing Checklists

Product				
Design Evaluation Checklist				
Last Test Date		Status		
Comments				
Category and Dimension			Yes	No
Pre-work	Has all suitability pre-work, including worksheets and checklists in Appendix E, been completed?			
	Has a pre-design analysis been completed?			
	Are all stakeholders aware of the effort?			
Performance Focus	Do the design document and design flow describe a performance focused solution?			
Objectives	Do the objectives directly support the performance and business requirements expressed in the method selection pre-work?			
	Are the objectives defined in the design document measurable in an eLearning environment?			
	Do the objectives establish an appropriate level of challenge for the audience?			

Design Strategy	Does media selection appear to focus on performance activities vice conveyance of information?		
	Does the design strategy appear to leverage media appropriately?		
	Are job aids and support materials included in the design strategy?		
	Does the design strategy present challenging activities?		
	Does the design strategy respect the experience and intelligence of the audience?		
	Does the design strategy frame the learning experience in authentic contexts?		
	Does the design strategy indicate visuals will be used to convey meaning?		
	Does the design strategy indicate rich and authentic feedback, in-line with the performance and business requirements?		
	Does the design strategy imply a learning cycle model?		
	Does the design strategy leverage remediation?		
	Does the design strategy indicate adaptive features that will provide opportunities for learners to place out of material they already know?		

Content	Is content written at an appropriate reading level (Flesch-Kincaid FOG index)?		
	Does content use correct grammar, spelling, and structure?		
	Do assessments comply with assessment requirements defined in this Appendix and Training System SOP 9?		
	Is all content relevant to the instructional objectives and performance requirements?		
	Is the organization and progression of topics logical?		
	Does the complexity progression of activities support the objectives and audience definition?		
	Are interactions available throughout the experience, not just at the end of a topic?		
	Is the projected length of the course suitable to the purpose and performance requirements?		
Accuracy	Is content current, accurate and error free?		
	Is content free of biased viewpoints?		
	Are the concepts and vocabulary represented relevant to the student's abilities and needs?		

Product				
Technical Evaluation Checklist				
Last Test Date		Status		
Comments				
Category and Dimension			Yes	No
Packaging Assembly	Was the packaging developed using non-proprietary tools?			
	Does the packaging meet all technical criteria outlined in Appendix D?			
	Is the published assembly well organized?			
	Is the packaging SCORM 1.2 conformant?			
	Are all files reasonably sized (~300Kb) considering the type of output?			
	Is code in the assembly organized, legible, and thoroughly commented?			
	Do file names follow guidelines established in Appendix E (no spaces, lower-case)?			

Packaging Quality	Are visuals applied consistently and of professional quality?		
	Are all visuals relevant to the content?		
	Are audio components clearly understandable and of professional quality?		
	Do all audio components play at a consistent volume?		
	Are audio elements (narration, sounds, music, etc.) relevant to the content?		
	Are screen transitions clean and free of excessive transition animations?		
	Are presentation layouts composed consistently?		
	Are themes and styles used consistently throughout the course?		
	Does the delivery meet all requirements defined in the statement of work?		
	Is the quality of the packaged delivery worth the cost of the contract?		
	Is the content consistently written in an active voice?		

Source	Are the source materials complete? Is there a source asset for each packaged asset?		
Operation	Does the course load successfully into the LMS?		
	Does the course restore bookmarked location?		
	Does the course record completion?		
	If a test is used, does the course record score?		
	When the learner has completed an activity and returns to a screen, does the solution remember the state of the activity (completed / not attempted)?		
	Is it clear to the learner when they have finished the course?		
	Is the use of audio clearly indicated to the learner?		

Usability	When screens load, is clear feedback provided for load progress?		
	Is font size legible throughout the course?		
	Is the learner's current location / progress clearly displayed?		
	Is it obvious to the learner when they have finished the course?		
	Are navigation control locations consistent with the default template?		
	Is it clear to the learner when audio is used?		
	Is it always clear what the learner must do to successfully progress through the course?		
	Are screens free of clutter?		
	Is it clear to the learner where they should get help or submit feedback?		
	Are references and information conveniently available when needed?		
	Does the learner have control (stop, play, rewind) over timeline based presentations and audio?		

Copyright	Has a materials inventory been included with the design submission?		
	Are all materials included in the design free of copyright?		
	Are licensed materials and stock imagery clearly marked on a media inventory and supported with license terms?		

Product			
Accessibility Evaluation Checklist			
Last Test Date		Status	
Comments			
Category and Dimension		Yes	No
Equitable Use	Equivalent means of use is available to all users.		
	Users are not segregated in a way that will draw unnecessary personal attention.		
	Users all have the same opportunities for privacy, security, and safety.		
	The design is appealing to all users.		
Accessibility Requirements	Packaging meets all requirements listed on page 91-92 of this appendix.		

Flexibility	Users have a choice of access methods.		
	Fonts and display area are scalable for convenient display by sight-impaired users.		
	Audio and video do not start automatically. Audio and video elements are played as a result of user interaction.		
Intuitive Use	Unnecessary complexity has been eliminated.		
	User experience is consistent and intuitive.		
	Diverse literacy and language skills are accommodated.		
	Information is arranged in a logical order, consistent with its importance.		
	Prompting and feedback is adequate and unambiguous.		
	Links use meaningful descriptions.		

Perceptible	Essential information is emphasized using available presentation modes (visual, audio, textual)		
	Essential information is displayed with adequate contrast from its surroundings.		
	Content is legible.		
	Elements are differentiated in ways that can be described using instructions.		
Tolerance for Error	Elements are arranged in a way that minimizes user errors.		
	Warnings and errors are communicated to the user.		
	When a major exception is encountered, the system fails gracefully.		
	Critical instructions are clearly communicated.		

XII. Course Deployment and Project Closure

Delivery Agreement

The delivery agreement closes the project between the ADLPO and the Project Sponsor. This can serve as a trigger for the COTR to recommend payment and indicate final acceptance but this form in itself does not provide this acceptance.

Course Deployment Form

A course deployment form must be completed and approved for each course prior to deployment to the production server. This form captures the course structure, description of all elements, and provides data required by the training system to track the course and meet mandatory reporting requirements. This form is normally completed by the ADLPO. *See your ADLPO for a copy of the course deployment form.*

USCG ADL Course Deployment Form		Date Submitted:
Direct Access Data		
Course Name		Course Code
Course Data		
Description (112 characters)		Catalog
Audience		Category
Pre-requisites		Type
Competency Short-Codes		Frequency
Governing Directive		Length
Notes / Instructions		Defaults
		Time Limit
		Course Access
		Lesson Order
		When approved for deployment Published to Yes. Also make sure that Closed and Locked are set to No.

Once the SCO has been accepted and tested on the development server, technical staff will upload the SCO to the fetch server upload folder (\\fetch.uscg.mil\File_Share\Development\Upload_Production).

Source File Delivery Requirements

Source materials shall be delivered in accordance with the common technical requirements within 10 working days of acceptance testing approval. See [Production Structures and File Naming](#) for structure and naming requirements.

Project Recordkeeping Requirements

Once a project has been accepted and deployed, all records of the course shall be committed to an electronic archive and select components shall be stored in a hard copy. An example of the electronic archive is illustrated in the source file delivery requirements. The hard copy contains the following items and is kept on file with the Solution Lifecycle Manager:

- Signed Alignment Agreement
- Curriculum Outline
- Project Plan
- Design Document
- Design Flow
- User Testing Results
- Signed Delivery Agreement

ADL Delivery Agreement

Project Title	
Project Duration	
Original Request	
Project Description	
Delivery Format	
Program POC	
Funding	
Maintenance Responsibilities	
Return on Investment	

Date Name, ADL Project Officer

Date Name, Branch or Section Chief

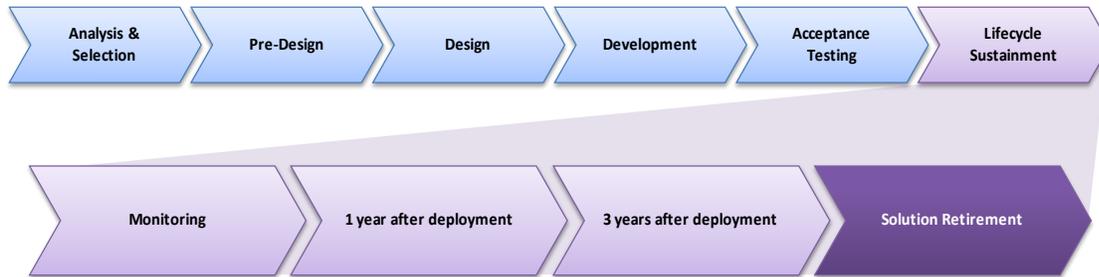
Date Name, ADL Program Office Representative

Date Name, XX Program Manager

XIII. Lifecycle Sustainment

What does the lifecycle of a Self-Paced eLearning solution look like?

An important aspect of the decision to develop a Self-Paced eLearning solution is the plan for sustaining the course over time. Commitment to lifecycle sustainment of the Self-Paced eLearning is part of the initiation phase. The requirements for sustainment are covered in this section.



What happens during the first year after deployment?

During the first year following deployment, a course will remain in the “ready update” status. This status indicates that a high volume of feedback and post-deployment corrections may be received through surveys and other feedback channels. While in this status, tier 1 and / or tier 2 development support services will be identified for any updates cleared by the Program Manager or Training Manager or as delegated to the Solution Lifecycle Manager (SLM).

When is the first disposition and update review due?

The **disposition and update review** is scheduled for three years from the initial deployment date and may be modified to a shorter cycle. The first review will never be longer than 36 months from deployment. While the official review for update and disposition is on a long cycle, shorter cycle reviews are expected for the purposes of evaluation, use trends, and functionality. These short cycle reviews will typically be conducted as a service provided by the designated Solution Lifecycle Manager (SLM).

Who conducts the triennial disposition and update review?

The triennial disposition and update review shall be conducted by the designated Solution Lifecycle Manager, reviewed and approved by the Training Manager and Program Manager, and submitted to the ADL Program Office before the disposition and update review date. The Solution Lifecycle Manager may work with the ADL Program Office, the Training Manager, and the Program Manager to complete the report.

What is examined during the disposition and update review?

In addition to any criteria indicated in the alignment and delivery agreements, the update review will consider these elements:

- Is the content current and relevant?
- Is the content package compatible with current technical requirements?
- Does the content package reflect current policy?

- Does survey data indicate that processes or practices don't match the training product?
- Does survey data indicate that the format of the training doesn't match user's needs?
- What are the usage and completion trends for this version of the product?
- Were any measurement criteria identified in the analysis, initial alignment, or delivery agreement?
- Has the mission that this solution serves changed since the deployment of the product?
- Does the solution still support mission requirements?

The disposition and update report requires signature from the Program Manager, Training Manager, and Solution Lifecycle Manager and will indicate whether the Self-Paced eLearning product:

- Can continue in service as-is
- Requires minor update
- Requires major update
- Is no longer required and may be retired

When is a Self-Paced eLearning product considered retired?

Product retirement removes a course from the LMS. Products will be retired when any of the following conditions are met:

- The product is incompatible with the LMS or the workstation
- The product loses Program Management commitment and support at the triennial review
- The product is ineffective or conflicts with policy
- The product is superseded by an update or alternate solution approved for use by the Program Manager or Training Manager
- When requested by the Program Manager or Training Manager

Who is the Solution Lifecycle Manager and what services does the SLM provide?

The SLM is a designated role assigned prior to Self-Paced eLearning solution deployment and is typically a persistent staff member in the eLearning support community. The SLM for Mandated Training is the ADL Coordinator. If TRACENs are unable to provide SLM for their eLearning solutions, the ADL Program Office will assist in identifying an SLM for the product.

The SLM provides monitoring and reporting services and serves as the maintenance tracking conduit for the lifecycle of the solution. Monitoring services include biannual functionality verification, use and completion trend reporting, and survey result reporting. The SLM also provides a sense of history for a solution and can brief incoming Program Managers and Training Managers.

I need an update due to a change or correction. How do I open a request to make this change?

Update requests are submitted to the designated SLM. If the update requires a content change and approval for the update has not been provided by the Program Manager or Training Manager, the SLM will seek approval prior to commissioning maintenance updates. The SLM may request Tier 1 or Tier 2 development support to assist with updates. *See the development section for a definition of development support tiers.*

If additional resources are required for the update, the SLM should check the original alignment and delivery agreements to see if the Program has a sustainment resource commitment. If additional resources are required to make updates or repairs to the product, the SLM will define these resource requirements and notify the Training Manager.

Updates may be made without PM / TM approval provided additional resources are not required for maintenance and the change fits within the SLM delegate authority (i.e., the change is clerical or functional and does not have policy or resource impact).

What are the post-deployment evaluation requirements for Self-Paced eLearning solutions?

Post-deployment evaluations will vary by product and shall be defined in the alignment agreement and delivery agreements. At a minimum, Kirkpatrick's Level 1 and Level 2 (either in efficacy / beta testing or on-going testing) evaluations shall be maintained.

If something stops working or requires update, I don't have the internal resources to maintain my contracted solution; where do I go?

The designated SLM for your solution coordinates maintenance. The SLM should be able to provide an overview of the Tier 1 and Tier 2 development support options available for internal maintenance support. The ADL Program Office can also be used as a resource to answer these questions, provide support and direction, and help identify an appropriate SLM if one has not been designated.

Evaluation of Self-Paced e-Learning

Why is it important to include an evaluation phase in the SPeL process?

Evaluation of SPeL provides information for decision making as part of the product sustainment effort. Evaluation outputs also become the inputs to product improvement and to re-considering implementation. Customers are interested in knowing the value of the training, the impact on learners' job performance, and impact on the learners' confidence to perform the task or job and when to adjust the content or delivery methods for their SPeL solution. Evaluation is critical to product improvement and continuation.

Evaluation of SPeL is to consider more than user interface characteristics of the software or student perceptions of the course. Other variables to be considered include duration off usage, frequency of log-ins, number of times the course was accessed by learner and by groups of learners, the learners' profiles and numbers related to passing the assessment portion of the SPeL.

Defining how to collect and what data can be collected via the LMS is in the formative stages. As the Coast Guard better defines the roles and responsibilities of the Solution Lifecycle Managers (SLM), the consideration of data collection will evolve.

Plan for evaluation from the initiation of the SPeL project and revise or update the evaluation plan during alignment and re-alignment meetings.

Data Collection for Evaluation

The data collection plan will differ from product to product, based upon the intent of the training and the type of course. For example, with Mandated Training courses the determination of impact may be as simple as documenting how many learners attempted the course, how many successfully completed it, and who those learners are. However, another implication of MT is that it will have an organizational impact either in the short-term or in the long-term.

Historically, evaluation focused on the functionality of the learning technologies and not on the actual learning or impact of the SPeL. The evaluation of learning from and impact of SPeL is based upon the four levels of training evaluation defined by Dr. Donald Kirkpatrick. These are described in the table below along with methods typically used to collect the data for each level of evaluation.

Table: Evaluation Methods

Evaluation Levels and Methods	
Level 1 Reaction	Collect information from students on their reaction to the training. What did they think of it? Student feedback can be an electronic form at the end of the SPeL or can be post-training surveys or questionnaires.
Level 2 Learning and Performance	Determine how best to collect data that will indicate whether the learners increased knowledge or capability. This may be as simple as passing rate of pre-tests and post-tests or more meaningful at the level of test item analysis. These are relatively simple to design into SPeL and produce quantifiable results.
Level 3 Behavior and Impact on Performance	Consider the data that would indicate the extent of behavior change and improvement in capability. This is likely demonstrated by transferring the training to job performance, indicating application of the knowledge. This may include the collection of both quantitative and qualitative data. Stakeholders and beneficiaries must be considered when determining the methods to collect data. Methods may include interviews, observations of a sample of learners' who completed the SPeL, or web-based surveys to both learners and their supervisors or line-managers.
Level 4 Organizational Impact	This level involves looking at results and effects of the training on the business/organization resulting from the learners' performance. It requires comparisons to other measures already in place. An example would be comparing data on sexual harassment complaints before MT and at intervals after MT. The process and data to be considered need to relate directly to the SPeL to determine clear relationships between the training and overall improvement in the organization.

Appendix F: EPSS STANDARDS GUIDE

USCG Training System SOP 7 Appendix F

Standards Guide: Electronic Performance Support Solutions (EPSS)

I. Appendix Overview

This appendix extends Training System SOP 7 (ADL) with guidelines, job aids, and examples that support the selection, design, and production of electronic performance support solutions. For more information on how solutions are selected and general process for approaching ADL solution providers see **Appendix A: Getting Started**.

Processes, forms, and requirements in this appendix will be followed for Electronic Performance Support Solutions unless otherwise noted.

Introduction

Using inputs from performance analysis, EPSS may be selected as the solution to close skills and knowledge gaps. The design, development, implementation, evaluation, and lifecycle maintenance/sustainment of EPSS are guided by the Coast Guard's Human Performance Technology (HPT) approach to solving performance problems or producing new performance. Inputs needed from analysis for effective EPSS solutions include:

- Job and major accomplishments
- Tasks to be performed
- Step-level data on the performance

Validation of analysis data by subject matter experts will provide the basis for EPSS, resulting in focused and measurable objectives. EPSS will provide just-in-time job performance guidance to build a better-prepared workforce.

What is the intended audience for this appendix?

EPSS can be complicated to design and develop. This appendix is designed to help Program Managers, Training Managers, training support personnel, and contract service providers. It provides a framework and a series of checklists and examples to align expectations.

Since this appendix is written for many roles, a grid is provided below.

<p>New to EPSS Solutions</p> <p>If you're new to EPSS your interests may vary. The first sections provide a definition and high level overview of the process used to select, initiate, and plan an EPSS.</p>	<p>Contract Service Provider</p> <p>Contract service providers will be interested in the deliverable requirements. USCG requirements may differ from other customers. Familiarize yourself with the process. Then review the design, development, and acceptance testing sections.</p>
<p>Program Manager</p> <p>As a Program Manager you're interested in getting a project moving. The first few sections provide a definition and overview of EPSS process and initiation. Begin by contacting your Training Manager for a consult. Digital Solution Consultants can be referred through the ADL Program Office (FC-Tadl) or the Performance Technology Center (FC-Tptc).</p>	<p>Designer /Developer</p> <p>Design professionals will be familiar with all facets of the ADL SOP but will follow the EPSS design philosophy and design process deliverables sections closely. Developers will be interested in the technical delivery requirements for the EPSS as well as the acceptance testing requirements.</p>
<p>ADL Project Officer</p> <p>The ADL Project Officer is the project controller for the EPSS project cycle. ADLPO ensures that deliverable requirements are met, there is alignment with the customer, and manages the cycle to successful conclusion of the project. Print the ADLPO Checklist and be familiar with all facets of the ADL SOP.</p>	<p>Solution Lifecycle Manager</p> <p>The Solution Lifecycle Manager is selected to provide services over the lifecycle of the solution. Start by printing the SLM Checklist. The SLM will also be familiar with all facets of the ADL SOP.</p>

What does this appendix cover?

- Definition of Electronic Performance Support Solution
- Overview of process for implementing an EPSS as an ADL solution
- When to select an EPSS as an ADL solution
- How to initiate development of an EPSS
- Design principles and requirements
- Development guidelines
- Deployment strategy
- Maintenance, evaluation, and sustainment
- Checklists and examples
- References and works cited

II. Definition of Electronic Performance Support Solution

What is an EPSS?

An Electronic Performance Support Solution (EPSS) is a packaged (self-contained) digital **task support** resource. The EPSS unifies relevant support and reference information, media, and guidance at a single, accessible point, organized in a logical and consistent structure. The provision of too little or too much information can cause a significant decrease in performance. A well-designed EPSS will provide just enough information to perform the tasks considered.

Who is the audience for an EPSS?

EPSS and Job Aids can successfully span multiple performer states and levels of expertise. Performance support tools are built to increase productivity, improve task accuracy, and enable performance from day one, with minimal training and regardless of the prior experience of the performer.

State of Performer	Benefit
Training not required or not feasible (training independent)	EPSS can provide ready task support regardless of formal training availability. EPSS can be a principal complement to a Structured On-The-Job Training program. EPSS will generally have lower sustainment costs than resident training, particularly considering the reach of the EPSS.
Performer hasn't received training yet, but will receive formal training (pre-training)	EPSS are designed to provide "just enough" orientation and task support to successfully accomplish tasks at the unit prior to training.
Performer is in training (training support)	EPSS help to support procedural knowledge that may accelerate lab activities or enable a balance of instruction that favors expertise development vice information transfer.
Performer has had training (post-training)	EPSS support the knowledge and skills gained in training by providing consistent and familiar resources once the trainee has returned to work.

EPSS can offer advantages and benefits not available from other solution types, particularly considering the synergies the EPSS can provide when combined with other solution types.

Design Philosophy

EPSS are designed to provide task relevant information at just the right time. **EPSS generally support activities across three categories:**

Activity	EPSS...
Explicit procedures	reliably guides the user through a complex procedural task the first time or every time for rarely encountered tasks. Ideally reduces the time-on-task by presenting only relevant information at the point of performance and reducing the time needed to find a method to execute the task.
Problem solving tasks	helps to resolve equipment troubleshooting tasks by providing charts, wizards, and media based symptom identification aids.
Decision making tasks	helps the worker choose the right decision path.

Performers use a range of methods to fulfill a task. EPSS are specifically structured and designed to make accessing these methods more efficient.

The ways a performer can access information:	
Recall	Performers are asked to store some critical information in memory. This storage space could be considered a finite resource and should only be used to store elements that really should be stored in memory. Analysis processes describe selection criteria that prescribe “train to memory”.
Search	Performers are supplied discoverable and accessible information that fills the gaps where memory recall isn’t feasible or necessary.
Learn	Performers are provided formal and informal opportunities to use information to formulate a mental model for execution. This mental model is intended to create a cognitive scaffold to strategically instill unassisted task performance.
Devise	Performers are asked to pull from their own knowledge, external information resources, and available learning resources to synthesize new solutions to encountered problems.

An ideal EPSS will intentionally leverage each of these factors. An EPSS is not merely a binder of information; an EPSS is a structured solution designed to help performers

reach each of these methods to accurately and efficiently accomplish tasks. An EPSS product achieves this synergy by using connections, centralizing process inputs, capturing required records, and automating updates as technical inputs change. For practical reasons that consider deployment requirements, typical EPSS development and content package deployment is disconnected and each product is independent of a central common data connection. This may change as the system empowers centralization and stakeholders identify shared benefits.

Do performance support tools stand alone?

Performance support tools can serve as a powerful foundation or complement to a training program and can potentially reduce costs and / or enable wider exposure to practical activities and coaching opportunities in the classroom. EPSS can also pair well with field-based On-the-Job-Training (OJT) activities and tasks that are not performed frequently.

Information on Blended Solutions is located in Appendix H: Combining ADL and Traditional Training.

Are EPSS official solutions? Do EPSS replace MPC / MRC resources?

Performance support tools are not replacements for technical data and logistical support guidance including Maintenance Procedure Cards (MPC) / Maintenance Requirement Cards (MRC). When an EPSS solution is available, it is a supplement for the MPC / MRC cards. In addition, MPC / MRC cards may be included in an EPSS to streamline the maintenance process. However, care must be taken to ensure performers understand that version updates of the EPSS may not match authoritative MPC / MRC sources.

By design, performance support tools provide a bridge between the technical data that supports the system, the concepts that support the application of skills, and the contexts that the worker is likely to encounter when performing a task. The task support and expertise development resources provided by a well designed EPSS can provide a powerful complement to authoritative guides for maintenance and onboard apprenticeship resources. EPSS is intended to accelerate skill acquisition and expertise development while reducing the demand on senior technician's time for new or infrequently performed tasks.

How does an EPSS differ from a well written manual?

Well designed EPSS' share many characteristics with a well written manual. In many cases a well written manual can offset or displace the need for rich media support. However, a manual cannot effectively deliver dynamic supporting media that contribute to performer orientation for concepts critical to the performance of a task. Careful consideration should be given to sustainability, accessibility, and the world of work of the performer expected to access an EPSS or manual for the performance of duties to determine which tool would best serve the need. A major advantage of EPSS is the distribution and inclusion of updated guidance/technical data that can be disseminated more easily electronically than in hard copy.

Where can I see examples of EPSS?

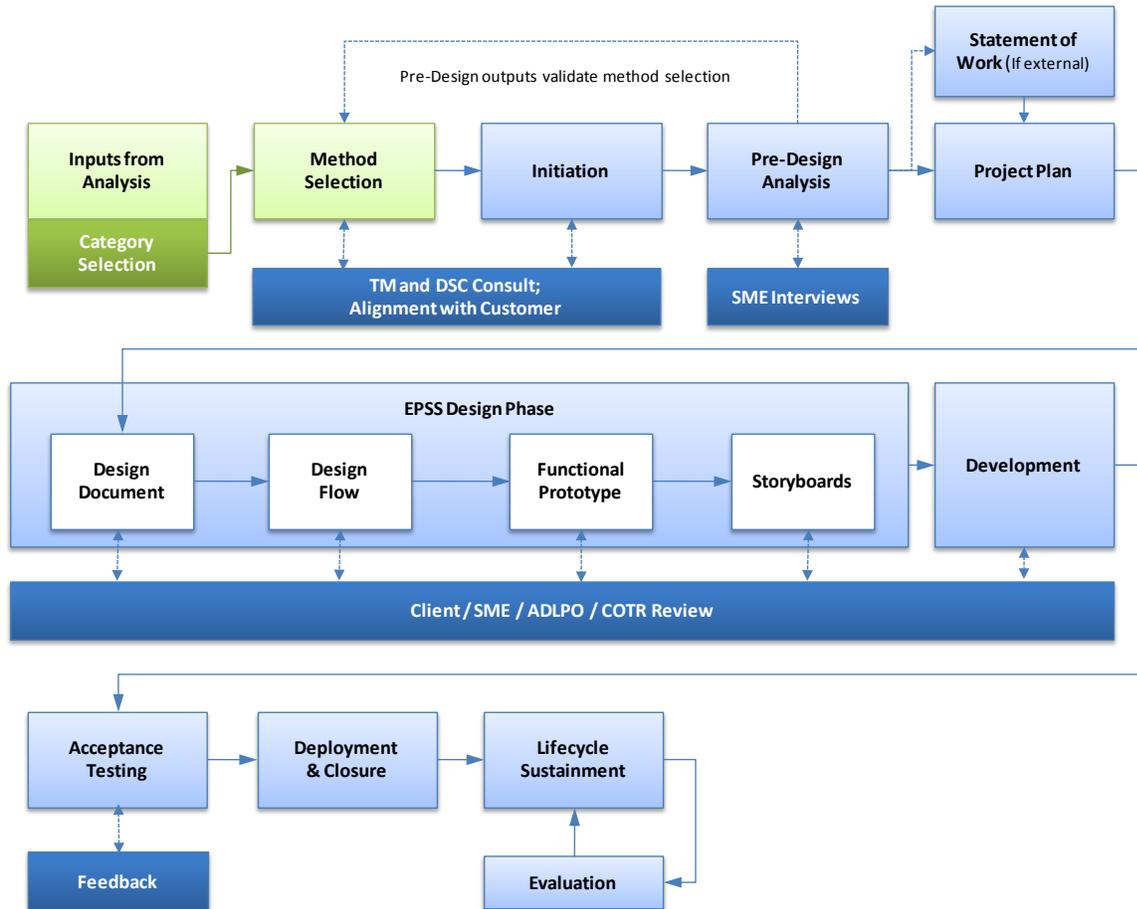
EPSS examples can be found at the USCG EPSS repository located at <http://epss.uscg.mil>. Additional examples are located in the last section of this Appendix.

The screenshot displays the user interface for the '87' Coastal Patrol Boat EPSS'. At the top, there is a header with the title '87' Coastal Patrol Boat EPSS' and a 'Change System' dropdown menu currently set to 'Gyro'. Below the header is a navigation bar with buttons for 'Contents', 'Search', 'Print', 'Glossary', and 'About', along with a search input field and a 'Go' button. The main content area is titled 'Checking the Cabling' and includes a 'Tools and Consumables' section listing a 'Pozi-Drive Screwdriver'. A central text box provides a step-by-step procedure for checking gyrocompass cabling, referencing 'gyrocompass error codes' and 'gyrocompass warning codes'. Below this, there are three numbered steps: 1. Obtain permission from the OD to secure the gyrocompass system for a minimum of 2 hours. 2. Secure and tag out IAW Tag-Out Log COMDINST 9077.1C the main 24-volt DC supply to the gyrocompass system. A warning box with a yellow triangle icon states: 'When the gyro compass is switched off, the rotors come to a standstill after a running-down time of approximately 15 to 30 minutes has elapsed. During this time, no intervention in the gyro compass must be made. The gyrosphere might be damaged!'. Step 3: Remove the 2 Pozi-Drive screws from the top of the cover. Swing the cover aside and remove the ground strap from the cover. Get the cover aside. A 'Down Arrow Open' button is next to step 3. A left-hand sidebar contains a table of contents with categories like Welcome, Introduction, Overview, System Description, Construction, Cautions, Operation, Controls and Indicators, Concept of Operation, Maintenance, Troubleshooting, Adjustments & Repair, and Resources.

Coastal Patrol Boat EPSS: Gyro System

III. Process Overview

An EPSS project has specific phases that conclude with the sustainment of a delivered and deployed solution. The process begins with inputs from a performance analysis. This input is used in determining the method for delivery of performance improvement.



The process shown above, specific to EPSS, mirrors the process framework illustrated in Appendix C: Common Processes and Forms. For a description of each phase and process element, see Appendix C.

Delivery Expectations

Each phase outputs deliverable requirements. The subsequent sections in this appendix describe the deliverable requirements for each EPSS phase.

To reduce risks, increase quality, and minimize unnecessary effort, a “Rough, Polished, Final” iterative cycle is required for most deliverables. The chart below illustrates how this will work for the design flow.

Deliverable Example	
Rough Design Flow	Government will review Rough Design Flow and provide feedback. Understand that roughs may include questions for the reviewer / SME and may not be complete.
Polished Design Flow	Government will review Polished Design Flow and provide feedback.
Final Design Flow	Final Design Flow integrates feedback from polished review cycle. Final submissions will be repeated (up to 5 times) until accepted.

The methods used for risk control and review shall be agreed upon at the project kick-off and alignment meeting and may be dictated in the Statement of Work (SOW) or Performance Work Statement (PWS). Some deliverables may not require a rough delivery and some projects may not have the schedule or resources to accommodate this risk mitigation strategy.

A rough > polished > final delivery sequence shall be followed unless indicated:

- within a deliverable definition
- within the statement of work
- during the project alignment

One notable exception to this sequence requirement is the functional prototype. While prototype media elements may be delivered in a rough state for validation, the functional prototype shall be delivered in a polished state.

This expectation is not intended as a burdensome requirement and should not require additional resources to accommodate. This expectation is placed as a time-saving approach for both the service provider and the customer.

Process Requirements

CGADL-F-001: Outputs designated in the **Design section** of this Appendix as deliverables **shall** be delivered and evaluated in the order indicated.

CGADL-F-002: Maintenance responsibilities and recurring funding for EPSS maintenance **shall** be identified during the alignment phase.

CGADL-F-003: A Solution Lifecycle Manager (SLM) for the EPSS **shall** be designated in the alignment documentation as well as the delivery / acceptance documentation. Designated SLMs shall be a permanent member of the solutions staff from PTC or the ADL program.

CGADL-F-004: Resource requirements not covered by the recurring resource agreements outlined in the alignment and delivery agreements **shall** be coordinated through the ADL Program Office and respective FORCECOM Training Manager.

IV. EPSS Selection

How is an EPSS selected as the appropriate solution?

Training System SOP Volume 2, Analysis, Appendices O, P, and Q outline solution selection criteria. Training materials and job aids with SABA Peak Performance System Phase I: Front-End Analysis and Phase II: Design training also guide the selection process. That process identifies the need for one of these: Training, Job Aids, Job Aids with Training, or non-training solutions.

EPSS is a classification of job aid. EPSS products that include embedded training components are referred to as hybrid digital solutions. EPSS are strong solutions for direct task support and can also support limited expertise development. See Training System SOP Volume 4, Job Aids, for a description and intent of a job aid. An EPSS may also be part of a blended or combined solution with residential training using the EPSS as a job aid to either introductory or extensive training. For more information on blended solutions, see Appendix H: Combining ADL and Traditional Training.

What are suitability indicators for EPSS?	
Complex tasks	Complex tasks contain many steps or require decisions/calculations to determine the process path.
Infrequent tasks	Tasks performed infrequently may require skill refresh or guidance for accurate or successful accomplishment.
Insufficient or scattered information resources	Tasks with poor information resources and/or technical documentation may make tasks difficult to perform. An EPSS can focus these resources or adapt the disclosure of information at the moment of need.
Limited recurring resources	When training resources are scarce, an EPSS may provide efficient task support and expertise development at a lower recurring cost than resident training alternatives.
Unreachable audience	Based on the size or location of an audience, it may be difficult to reach performers with training. A centralized EPSS can help to alleviate limited reach.

Frequent change	Content that changes frequently can be centrally updated. Resident training might not be a good exclusive choice for content that changes frequently. An independent EPSS or EPSS connected to course content can help to bridge change related gaps after initial training delivery.
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Rarely is a single solution as effective as a blended solution. Wherever possible, a job aid or EPSS should be considered for inclusion in a network of integrated solutions.

EPSS Requirements

Requirements listed in each section extend requirements outlined in Appendix D, Common Technical Requirements, and Appendix C: Common Processes and Forms.

Unless noted, requirements established in this SOP can be waived by the ADL Program Office. Those seeking a waiver should submit a business case and specific requirements to the ADL Program Office for approval.

V. Initiation of EPSS Project

I think an EPSS is the right solution. Where do I begin?

To initiate an EPSS project, the Program Manager (PM) or Project Sponsor contacts their Training Manager (TM) or the ADL Program Office (FC-Tadl), who will enlist a performance consultant and Digital Solutions Consultant (DSC) to determine next steps. If there is a recent performance analysis or validated task list, this needs to be shared with the TM, ADL Program Office and DSC

To prepare for the consult, the Program Manager or Project Sponsor will complete the Pre-Consult Checklist (below) and provide a performance analysis or a task list from other sources. The PM will collect information pertinent to the proposed project, including recent analysis or task list from other sources and the goal or performance impact that is expected from the EPSS. Bring these materials to the consult where the team will determine whether EPSS is the most appropriate solution, project some timelines and give a general estimate of project costs.

Pre-Consult Checklist—Electronic Performance Support Solution		
Yes	No	
		Is the audience widely dispersed or operating on varied schedules?
		Is the population small making a training intervention inappropriate?
		Is this a one-of-a-kind platform or is the equipment unique to the Coast Guard?
		Is there a lot of information that performers need to access?
		Does the information need to be committed to memory?
		Is the information technical in nature?
		Is the information from multiple sources (manuals, logistics support plans, maintenance procedure cards, regulations, etc)?
		Is the information support needed at the point of performance and time of performance?
		Is existing material adequate and performance-based?
		Is existing material useable by the performer at point of performance?
		Is training available?
		If training is available, is it reasonable to support and utilize?
		If training is available, is it adequate without extraneous information?
		Does any existing training need an electronic performance support to supplement or enhance the curriculum?
		What is needed: a stand-alone EPSS or EPSS with embedded or supplemental training?
		Can an EPSS be used to complement existing lower level training or skills?
		Are performance concepts or information likely to change?

Pre-Consult Checklist—Electronic Performance Support Solution		
Yes	No	
		Is performance on actual equipment required?
		Do performers have access to the technology needed to deliver an EPSS?
		Does leadership or management support the use of an EPSS solution?
		Will the performers accept an EPSS solution?
		Are Subject Matter Experts (SMEs) available to support the design and development of an EPSS and to review deliverables?
		Are funds available for an EPSS solution design and development/delivery?
		Is any certification required as an end result?
		Will the cost, economy, and other considerations make EPSS the most suitable solution to the performance problem?
Timeline: When is the EPSS needed? Is there an urgent need?		
Additional Information:		

When an EPSS solution is determined to be the best delivery method to meet the customer’s needs, an ADL Project Officer (ADLPO) is assigned. ADLPOs will follow the steps provided in the ADLPO EPSS Checklist (see below) throughout the phases of the EPSS project. The ADLPO will schedule an alignment meeting with the Program Manager or Project Sponsor; this is the same for internal to the Coast Guard or externally contracted EPSS design and development. The PM, ADLPO, and DSC document and agree on performance to be addressed, project scope, funding, timeline,

and roles resulting in an alignment agreement. An example of an alignment agreement can be found in Appendix C: Common Processes and Forms.

ADLPO Checklist—Electronic Performance Support Solution			
Pre-design		Yes	No
1	Does analysis clearly indicate a skill/knowledge gap?		<i>Conduct analysis or reconsider solution</i>
2	Is EPSS a suitable delivery method for all tasks?		<i>Reconsider solution</i>
	<i>Use pre-design checklist.</i>		
	Is EPSS suitable for deployment to the audience?		
	<i>Use pre-design checklist.</i>		
3	Are the solution's instructional objectives appropriate to EPSS?		<i>Rework objectives</i>
	Do the instructional objectives directly reflect performance requirements?		
4	Does the EPSS design concept and associated assessments describe a meaningful experience?		<i>Rework design concept</i>
	<i>Use Design Document checklist to evaluate the design concept.</i>		
5	Have the Program Manager and Training Manager reviewed the Pre-design Analysis and signed the Production Project Alignment ?		<i>Obtain approval or rework</i>
6	If externally contracted, do Statement of Work requirements align with solution requirements identified in the pre-design analysis?		<i>Rework statement of work</i>

ADLPO Checklist—Electronic Performance Support Solution

Design		Yes	No
7	Is the Project Plan complete?		<i>Rework Project Plan</i>
	<i>Use Project Plan checklist to evaluate the Project Plan.</i>		
8	Is the Design Document complete?		<i>Rework Design Document</i>
	<i>Use Design Document checklist to evaluate the Design Document.</i>		
9	Does the Design Flow sufficiently elaborate the design concept described in the design document?		<i>Rework Content Flow</i>
10	Does the Functional Prototype meet technical requirements and quality expectations?		<i>Rework Functional Prototype</i>
	<i>Use Prototype checklist to evaluate the Functional Prototype.</i>		
11	Do the Storyboards sufficiently elaborate the Design Flow?		<i>Rework Storyboards</i>
	<i>Use Storyboards checklist to evaluate the Storyboards.</i>		
Development		Yes	No
12	Have you requested review access to the development server for all reviewers?		<i>Request Accounts</i>
13	Does each incremental development delivery represent the approved storyboards?		<i>Submit Discrepancy Report</i>
14	Does the final delivery include all elements required in the Statement of Work?		
Acceptance Testing		Yes	No
15	Does the final delivery pass acceptance testing?		<i>Resubmit for testing once remedied</i>

ADLPO Checklist—Electronic Performance Support Solution			
Delivery and Project Closure		Yes	No
16	Have all source materials been delivered?		<i>Request source materials</i>
17	Has deployment been planned?		<i>Complete deployment plans</i>
18	Has the Delivery Agreement been approved?		<i>Submit Delivery Agreement</i>

As a Program Sponsor, what do I need to commit to the project to maximize success?

Clear goals, clear content, and reasonable engagement at each approval or review iteration help drive an EPSS production to successful completion. Each of these elements is critical. If any of these three elements is missing, the effort and product quality and delivery schedule may suffer. Delegation of the goals, content expertise, and approval are common. Expectations for level of engagement are identified during the initial alignment.

What does an EPSS cost to build?

For the intended purpose, EPSS are generally less costly than training solutions. Costs for EPSS development can vary and depend on many factors. Cost is a large factor in the selection of a solution. The budget and cost estimate should also frame value expectations in each deliverable. A digital solution consultant (DSC) can help you nail down resource costs and commitment requirements. Contact the ADL Program Office or Performance Technology Center to schedule a consultation.

What documentation is required prior to initiating production?

A recognized and complete analysis output (i.e. FEA, JTA, RTA, etc) is typically required prior to commencing any solution development effort. A pre-design analysis and task validation will also be conducted prior to beginning design for an EPSS.

VI. EPSS Pre-Design

A pre-design analysis begins with input from the performance analysis.

A performance analysis shall be performed to identify performance gaps prior to any solution work. Many elements of the performance analysis will be usable in the pre-design analysis phase. The results of the performance analysis are documented in a report that identifies performance gaps, accomplishments, tasks, steps, and performer variables. See Training System SOP, 2 (Analysis) for CG-approved analysis methodologies.

This phase shall precede the establishment of a statement of work for contracted solution services to increase the probability that the requested solution will meet program needs and optimize value of the solution services. This phase shall also precede any solution design work. The outputs of this phase include a task outline, problem statement, solution concept / design document, objectives, and a rough cost estimate for the solution.

Deliverable Requirements

Pre-Design Alignment Agreement

The pre-design alignment establishes expectations for pre-design activities, defines scope of consultation, includes a rough schedule and identifies stakeholders with approval authority. See Appendix C: Common Processes and Forms for an example of an Alignment Agreement.

The Pre-design Alignment Agreement is signed by:

- ADLPO and ADL development entity command chain
- Program Manager/Customer
- Training Manager
- Designated Solution Lifecycle Manager

The Pre-design Alignment Agreement must be signed prior to moving forward with pre-design analysis.

Pre-Design Analysis Report

The pre-design analysis report assembles the output of the following tasks:

- Identify performance leaders and subject matter experts

- Identify target audience and work environment factors
- Validate task list with a subject matter expert (SME) for accuracy and currency
- Collect step-level data and sub-steps if needed for each task
- Prioritize tasks
- Identify available support resources
- Identify available GOTS / COTS resources
- Determine product delivery/deployment requirements

Statement of Work (SOW) or Performance Work Statement (PWS)

If solution services will be externally contracted, the final step in the pre-design analysis phase is assisting the ADL Program Office to develop requirements for a SOW or PWS that is informed by the performance analysis and pre-design analysis.

Project Plan

The project plan is the guidance and management document for an EPSS project. It describes the:

- Work to be conducted; scope
- Personnel roles and responsibilities
- Deliverables and project timeline
- Risk and quality management plans
- Anticipated travel
- Progress reports

The Project Plan must be approved by the ADLPO and designated program representative prior to moving forward with the Design Document.

A checklist to guide preparation of the Project Plan is below. An example of a Project Plan can be found in section XII of this Appendix. Also, a sample documentation package with examples of each design deliverable is available upon request from the ADL Project Office.

Project Plan Checklist – Electronic Performance Support System

Project Name: _____
 ADLPO: _____
 Task Order: _____
 Contract Number: _____

Name of Reviewer: _____ Date of Review: _____

1. Overview		Yes	No
1.1	Details project title and start date		
1.2	Describes scope of the project		
1.3	If externally contracted, includes Task Order and Contract Number and vendor contact information		

Comments:

2. Personnel		Yes	No
2.1	Lists personnel roles and responsibilities		
2.2	Lists project personnel contact information		

Comments:

3. Deliverables		Yes	No
3.1	Lists all deliverables associated with the project		
3.2	Assigns delivery date for each deliverable		
3.3	Assigns person responsible for each deliverable		

Comments:

Project Plan Checklist – Electronic Performance Support System			
4. Milestones and Schedule		Yes	No
4.1	Uses Work Breakdown Structure to describe each required task		
4.2	Includes milestones, task dependencies, task duration, delivery dates, and quality milestones		
Comments:			
5. Milestones and Schedule, Continued		Yes	No
5.1	Includes government/customer review dates and duration (not less than 10 work days)		
5.2	Includes diagrams (such as a GANTT/ PERT Chart) to illustrate project schedule		
Comments:			
6. Estimated Cost breakdown		Yes	No
6.1	Itemizes time and cost for each activity in the WBS		
6.2	Estimates costs for all material and expected travel		
Comments:			

Project Plan Checklist – Electronic Performance Support System			
7. Risk Management		Yes	No
7.1	Identifies items which could affect completion of milestones or the project		
7.2	Describes plan for mitigating identified risks		
Comments:			
8. Quality Management		Yes	No
8.1	Identifies person responsible for quality control		
8.2	Details procedures used to maintain quality control		
8.3	Identifies resources required to conduct quality assurance		
Comments:			
9. Expected Travel		Yes	No
9.1	Details budgeted travel		
9.2	Documents anticipated travel cutoff dates		
Comments:			

Project Plan Checklist – Electronic Performance Support System			
10. Progress and Status Reports		Yes	No
10.1	Defines strategy for reporting progress		
10.2	Defines frequency requirements for reporting progress		
10.3	Describes strategy for incorporating feedback		
Comments:			
11. References		Yes	No
11.1	Identifies GFI and other relevant sources		
11.2	Identifies Subject Matter Experts(SMES)/Accomplished Performers (APs)		
Comments:			

VII. EPSS Design

The design phase is informed by the pre-design analysis. This phase shall precede development and testing of the solution to minimize rework risks and establish expectations. Successful processes may vary by solution and engagement. **This step is required prior to development.**

What should a designer consider when conceptualizing an EPSS?

Designers shall consider the primary goals of the solution in each design decision. Method and media selections must support these goals and shall be documented and defensible in advance of delivery. The environment where the EPSS will be used will also affect design and development decisions.

Goals	Design Considerations
Task Support Remove on-the-job task-related bottlenecks.	<ul style="list-style-type: none"> • Provide rapid access to job related information. • Provide help, guidance, and advice. • Provide evaluation tools and rubrics for validation of work performed.
Expertise Development Overcome real-time skill and knowledge related gaps.	<ul style="list-style-type: none"> • Provide just-in-time, task-based training support. • Provide skill practice (cognitive skills) just-before moment of need.

An EPSS can be mechanically deconstructed into four distinct layers.

Layer	Description
Interface Shell	Provides the user with a mechanism for access and control. Examples include construction frames, nested table of contents, standard menus, and search facilities. See section V for an example of the interface shell.
Generic Tools	Generic tools include the interaction patterns and media methods described below. These are generic information articulation and elaboration support methods that can be helpful in task support or expertise development. <ul style="list-style-type: none"> • Help systems • Documentation (linked or embedded) • Indexed Search • Intelligent Agents / Wizards

Layer	Description
	<ul style="list-style-type: none"> • Tutorials / Orientations / Demonstrations • Simulation Tools • Communication Resources
Application Specific Support Tools	Any tools that are specifically built to support a task. For example, an alignment or programming utility loaded to a piece of hardware necessary to make adjustments to a piece of equipment.
Application Domain	The setting and context that contains the task set establishes the framework for the EPSS. In other words the demands of the job, as viewed from the performer's perspective helps determine the design construct for each EPSS.

The structure of an EPSS product may vary depending on the application domain, specific support tools, and other contextual elements. A technical EPSS will typically follow this structure:

- Overview (construction, description, cautions)
- Operation (controls and indicators, concept of operation)
- Maintenance (philosophy and tasks)
- Troubleshooting
- Adjustments and Repair
- Resources and References
- Glossary

Deliverable Requirements

Production Alignment Agreement

The production alignment agreement outlines the solution scope and includes a rough schedule, documents sustainment expectations, and identifies stakeholders with approval authority. The sample Alignment Agreement in Appendix C: Common Processes and Forms will be used for the Production Alignment.

The Alignment Agreement is signed by:

- ADLPO and ADL Development entity command chain
- Program Manager/Customer
- Training Manager
- Designated Solution Lifecycle Manager

The Alignment Agreement must be signed prior to moving forward with design.

Design Document

The Design Document defines the scope and goals of the solution at a high level. See Appendix C: Common Processes and Forms for an example of a Design Document. The Design Document includes:

- Design approach and templates
- Target audience description
- Design content (tasks, TPOs, EOs)
- Evaluation
- Assumptions and constraints

A checklist to guide preparation of the Design Document is below.

The Design Document must be approved by the ADLPO and designated program representative prior to moving forward with a Production Alignment Agreement.

Design Document Checklist – Electronic Performance Support System

Project Name: _____

ADLPO: _____

Task Order: _____

Contract Number: _____

Name of Reviewer: _____ Date of Review: _____

1. Cover		YES	NO
1.1	The title of the EPSS is included		
1.2	The organization developing the EPSS is included		
1.3	The submittal date of the design document is included		
1.4	A signature block for the ADLPO and Program Sponsor is included		

Comments: (required if NO)

Design Document Checklist – Electronic Performance Support System

2. Introduction		YES	NO
2.1	Findings relating to performance and performance gaps are summarized		
2.2	The desired performance associated with the EPSS is described		
2.3	Identified challenges are briefly discussed		
2.4	The scope of the EPSS is outlined		
Comments: (required if NO)			
3. Design Approach		YES	NO
3.1	The target audience is identified		
3.3	High level goals and mission requirements are listed		
3.4	The method of deployment is identified		
Comments: (required if NO)			
4. Design Application		YES	NO
4.1	Elements to be included in design (i.e. Table of Contents, glossary, full text search, etc.) are listed		
4.2	Developmental tools that will be utilized are listed		
4.3	Any templates that will be used are identified		
Comments: (required if NO)			

Design Document Checklist – Electronic Performance Support System

5. Design Content		YES	NO
5.1	Validated task list is presented		
5.2	Terminal performance objectives (TPOs) are listed if there is a training or assessment element associated with the EPSS		
5.3	Enabling objectives (EOs) are listed if there is a training or assessment element associated with the EPSS		
5.4	The use of media (graphics, video, illustrations, etc.) for this EPSS is identified		
Comments: (required if NO)			
6. Evaluation		YES	NO
6.1	Test and inspection points are identified		
Comments: (required if NO)			
7. Team Members		YES	NO
7.1	Each team member is listed with their role(s)		
Comments: (required if NO)			

Design Document Checklist – Electronic Performance Support System

8. Additional Information		YES	NO
8.1	Any questions, validations, and assumptions that need to be addressed and/or noted are documented		
8.2	Sources used to prepare the Design Document are included		
Comments: (required if NO)			
9. Overall Rating		YES	NO
Comments:			

Design Flow

The design flow establishes the solution blueprint and answers the following questions:

- What application specific support tools (wizards, calculators, and utilities) will be designed or supplied to support performance goals?
- What methods, interaction patterns, media, and tools will be used to support performance goals for each task?

The Design Flow must be approved by the ADLPO and designated program representative prior to moving forward with storyboards.

For an example of Design Flow, see Appendix C: Common Processes and Forms. The Design Flow Document Checklist follows.

Design Flow Checklist – Electronic Performance Support System

Project Name: _____
 ADLPO: _____
 Task Order: _____
 Contract Number: _____

Name of Reviewer: _____ Date of Review: _____

Design Flow – What to Include		YES	NO
Simple	The format selected is simple enough to communicate the structure to a person without EPSS design experience.		
Represents Segments and Strategy	The design flow typically does not show individual screens. Instead, it represents segments (learning steps / activities). This shows just enough detail to depict the overall flow of a learning activity within the structure.		
Represents Features	Does not indicate all specific menus, feedback, or remediation screens but may provide an example that represents how these will be handled. Indicates which features will always be available to the learner (help, glossary, etc.)		

The design flow is helpful both as an incremental deliverable and as a map to orient subject matter experts and reviewers to storyboards and development increments.

Functional Prototype

Prototypes are not required for products that will follow established patterns of presentation or interaction. New patterns require an approved prototype.

The functional Prototype will include:

- Major structural components
- Templates
- Navigation
- Media/interactivity

A checklist to guide preparation of the Prototype is below. Example elements of a functional prototype are located in Section XII: Examples of this appendix.

The Prototype must be approved by the ADLPO prior to moving forward with development.

Use the Functional Prototype Checklist for EPSS below.

Functional Prototype Checklist – Electronic Performance Support System				
Project Name: _____				
ADLPO: _____				
Task Order: _____				
Contract Number: _____				
Name of Reviewer: _____ Date of Review: _____				
1. Major Structural Components			YES	NO
1.1	Meets established requirements specified in the Technical Requirements.			
Comments: (required if NO)				
1.2	Components function properly for evaluation.			
Comments: (required if NO)				
2. Templates			YES	NO
2.1	Templates are used throughout EPSS.			
Comments: (required if NO)				

Functional Prototype Checklist – Electronic Performance Support System

2.2	Uses icons and boxes for notes, warnings, caution consistently (see Example 2).		
Comments: (required if NO)			
2.3	Uses easy to read font and style.		
Comments: (required if NO)			
2.4	Limits use of colors unless relevant to the topic, event. Contrast is used to focus learner.		
Comments: (required if NO)			
2.5	Layout is balanced and elements are aligned to have a visual connection on the page (see Example 3).		
Comments: (required if NO)			
2.6	Layout gives user focal point for important information, flow of topic, and content points.		
Comments: (required if NO)			
2.7	Content layout utilizes drill down to reduce cognitive load on user (progressive disclosure) wherever possible.		
Comments: (required if NO)			

Functional Prototype Checklist – Electronic Performance Support System

2.8	Header frame at top is not larger than 80 pixels in height (smaller is better), but spans across page.		
Comments: (required if NO)			
2.9	Utilizes Coast Guard visual branding.		
Comments: (required if NO)			
3. Navigation		YES	NO
3.1	Entry into the EPSS should be both textual and graphical (see Example 4). Exiting the EPSS is via closing the browser window.		
Comments: (required if NO)			
3.2	If the EPSS is comprised of more than one module, navigation to other modules, will be a drop down box at the top in the same line as the buttons that allows the user to pick a different module to enter. (see Example 4)		
Comments: (required if NO)			
3.3	Follows logical/progressive workflow of tasks and processes, is easy for the user to understand how to get around, and allows user to quickly find a relevant topic.		
Comments: (required if NO)			

Functional Prototype Checklist – Electronic Performance Support System

3.4	Navigation is consistent throughout the EPSS.		
Comments: (required if NO)			
3.5	Uses hyperlinks in topics to connect users to various pages, topics, references.		
Comments: (required if NO)			
3.6	Client side full text search is available and searches all topics, pages, and pdfs.		
Comments: (required if NO)			
3.7	The following buttons are available and functional: Content, Glossary, Search.		
Comments: (required if NO)			
3.8	Breadcrumbs are used to assist user in navigation.		
Comments: (required if NO)			
3.9	Table of Contents is on the left side of the page, is organized into books and topics, shows user where he/she is at, is expandable/collapsible, and page and book titles are concise.		
Comments: (required if NO)			

Functional Prototype Checklist – Electronic Performance Support System

4. Media/Interactivity		YES	NO
4.1	All media elements meet a high standard of quality, including clear, non-blurry, any text is easy to read.		
Comments: (required if NO)			
4.2	Elements that display graphics are a consistent size and if not directly on the page, are displayed in own window or pop-up/box that can be closed.		
Comments: (required if NO)			
4.3	Elements do not detract from content, hide content (ie cover text needed for viewing), and, if video are not longer than 3 – 4 minutes except under special cases.		
Comments: (required if NO)			
4.4	User can easily identify purpose/focus of graphic. (Space proximity in design considers placement of items, people in graphics)		
Comments: (required if NO)			
4.5	Graphics (photos, illustrations, etc.) on a page are displayed in a frame with a background that differs from the page background (see Example 1 below).		
Comments: (required if NO)			

Functional Prototype Checklist – Electronic Performance Support System

4.6	Video windows are large enough to clearly represent tasks/concepts. Should fit in window same size as graphic elements on page with rare exceptions.		
Comments: (required if NO)			
4.7	Video windows include a play, pause, stop button.		
Comments: (required if NO)			
5. Overall Rating		YES	NO
Comments:			

Storyboards

Task-based storyboards establish all of the content details and media architecture that will be applied in the developed output.

Storyboards will include:

- Major structural components
- Organization
- Technical sequences
- Content
- Media

The Storyboards must be approved by the ADLPO and designated program representative prior to moving forward with development.

A checklist to guide preparation of the Storyboards is below. In addition, an example of a task-based Storyboard is located in the last section of this Appendix. Items in the Storyboards that need to be changed will be documented in a Discrepancy Report (see Appendix C).

Storyboard Checklist - Electronic Performance Support Solution

Project Name: _____

ADLPO: _____

Task Order: _____

Contract Number: _____

Name of Reviewer: _____

Date of Review: _____

Storyboard Checklist--EPSS			
1. Major Structural Components		Yes	No
1.1	Meets established requirements specified in the Design Document.		
1.2	Contains all resources, topics and tasks listed in the task list, design flow and/or outline.		
1.3	Delivered as a Microsoft Word document.		
Comments: (Required if NO)			
2. Organization			
2.1	Uses a Table of Contents to organize subjects into books and topics.		
2.2	Navigation is consistent and will work with prototype template.		
2.3	Page titles and subtitles help to organize the subject matter.		
Comments: (Required if NO)			

3. Technical Sequences		Yes	No
3.1	Step-by-step procedures are organized and illustrated in consistent manner.		
3.2	Specific tasks are easy to find.		
3.3	Hyperlinks are used to connect user to the technical reference source.		
Comments: (Required if NO)			
4. Content		Yes	No
4.1	Amount of information on one page is limited and does not make the user scroll more than 2 page lengths.		
4.2	Written in the language of the user, with no spelling or major grammatical errors.		
Comments: (Required if NO)			

5. Media		Yes	No
5.1	Media elements (audio, video, animations) are of high quality. The correct graphics are used to illustrate concepts, relationships, processes etc. whenever possible.		
5.2	Missing images and media are given placeholders.		
Comments: (Required if NO)			
6. Overall Rating		YES	NO
Comments:			

Planning Artifacts

Each project may have differing media requirements. The following artifacts will be established prior to development, as needed:

- Photo shot / media construction list
- Media selection justification

Design Requirements

CGADL-F-005: Designers **shall** consider the primary goals of the solution in each design decision. Method and media selections that support these goals shall be documented and defensible in each deliverable.

CGADL-F-006: Media selection **shall** directly support the performance of the task(s) included in the EPSS.

CGADL-F-007: Content design **must** focus on task relevant information. Content should not be replicated from references or authoritative sources unless required or strategically added and processed for brevity.

CGADL-F-008: Content design **must** include special notices whenever appropriate.

Special notices highlight special information the reader needs to know to accomplish what they need to do, what they need to know to prevent damage to equipment, or to prevent injury. Special notices are to be contained in its own box with an easily identifiable icon representing the notice. Boxes should be distinguishable from each other and other text on the page through the use of subtle outlines and transparent colors for each type of notice. All caps will not be used in the notices and bold or underline will be used for emphasis as needed. The table below outlines the definition of each notice and location on the page. An example is provided in the checklist.

EPSS Special Notices:	
Note	Notifies of installation, operation, maintenance, or other information that is important to be pointed out, but is not hazard-related. Notes appear below the step in the procedure to which they relate.
Caution	Indicates a potentially hazardous that, if not avoided, could result in minor to moderate injury and/or damage to equipment. Can also be used to alert to unsafe practices. Cautions are placed above the step in the procedure they relate to.
Warning	Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death and/or damage to equipment. Warnings are placed above the step in the procedure they relate to.
Danger	Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury and damage to equipment. This notice should be limited to the most extreme situations. Dangers are placed above the step in the procedure to which they relate.

Functional Requirements

EPSS products MUST include the following features and functions:	
Client Side Search	The product must be searchable using a built in client side search function. All documents and content should be indexed for the search.
Task-driven Table of Contents	The table of contents should include a nested / hierarchical structure of the tasks and associated task support content.
Hypertext Topic Access	Topics and resources should be hyperlinked as appropriate in the table of contents and between content pages.

CGADL-F-009: In addition to screen layout requirements established in the common technical requirements, the EPSS user interface shall comply with the zone mapping illustrated below:



VIII. EPSS Development and Testing

Development and Testing is the production and assembly phase. Development is usually incremental following a cycle of in progress reviews (IPRs) and other formative evaluation. Development outputs shall align with the documentation preceding the development phase. Deviation from the established and approved design artifacts requires approval.

What tools are used to build EPSS products?

A variety of tools can be used to build EPSS. Tool selection should be determined by lifecycle and functional requirements.

Media Selection	
Print-based Assets	It may be more efficient to begin by developing print-based assets (references and job aids).
Media-based Assets	It will be necessary to articulate the rationale for selection of media. Questions regarding acceptable incorporation of media should be directed to the ADLPO.

The Performance Technology Center currently uses Adobe Robohelp to assemble most EPSS products. However, each EPSS component can be edited by other software tools. See SOP7: ADL , Appendix D: Common Technical Requirements for guidance in selecting and using development tools and output packaging formats, and for more on the requirement for development using commercial-off-the-shelf (COTS) or government-off-the-shelf (GOTS) products.

Deliverable Requirements

Assembled Solution

The completed EPSS is delivered to the customer for content review by SMEs. A discrepancy report documents items that require change. For an example of a discrepancy report, see Appendix C: Common Processes and Forms.

Acceptance Testing and Validation

The assembled solution is evaluated for compliance with technical and functional requirements. The solution may also be tested with a focus group at the polished and

final stages. A discrepancy report documents items that require change. (See Appendix C: Common Processes and Forms, for more information on acceptance testing and for a discrepancy report format.)

EPSS source materials

All EPSS source materials shall be delivered following acceptance of the final product.

Signed Delivery Agreement

Following delivery of all production deliverables including source materials, a delivery agreement shall be signed to conclude services. The delivery agreement is generated by the ADLPO. See Appendix C: Common Processes and Forms for a sample Delivery Agreement.

IX. EPSS Deployment

Where and how is the EPSS deployed once it's complete?

After it has been accepted and a Delivery Agreement signed, the EPSS will be deployed.

CGADL-F-010: All unclassified EPSS products **shall** be deployed to the central repository located at <http://epss.uscg.mil>. Deployment requests shall be routed through the ADL Program Office.

In addition to the EPSS repository, products may also be deployed via CD-ROM, DVD-ROM, or deployment to approved non-standard portable hardware. Requirements for EPSS deployment/delivery are identified no later than the alignment phase of the project timeline.

Unless stipulated in the SOW, the application S1000D and DITA standards are not required. However, content portability and abstraction of data from presentation logic WILL be considered wherever possible.

X. EPSS Maintenance, Evaluation & Sustainment

Who maintains and sustains the EPSS once it has been built?

After delivery has been accepted the solution enters the maintenance, evaluation, and sustainment phase. Product maintenance requests shall be directed through the Training Manager via the designated Solution Lifecycle Manager.

Maintenance and sustainment responsibilities and recurring funding for EPSS maintenance shall be identified during the alignment phase of an EPSS product build. Maintenance updates are coordinated through the designated Solution Lifecycle Manager (SLM). The SLM is designated in the alignment and delivery / acceptance documents. This maintenance may be contracted or executed through consultation with internal development resources. Customers with content accuracy concerns or maintenance needs should contact their SLM.

Resource requirements not covered by the recurring resource agreements outlined in the alignment and delivery agreements shall be coordinated through the ADL Program Office and respective FORCECOM Training Manager.

XI. References and Works Cited

Banerji, & Bhandari. (1997). *Designing EPSS for the Marine Industry*.

Desmarais, Leclair, Fiset, & Talbi. (1997). *Cost-Justifying Electronic Performance Support Systems*.

Krug, S. (2000). *Don't Make Me Think: A Common Sense Approach to Web Usability*.

Nielsen, J. (2000). *Designing Web Usability*.

Rossett, A., & Shaefer, L. (2006). *Job Aids and Performance Support*.

Additional information and resources can be found at <http://www.epsscentral.info/>.

XII. EPSS Examples

There are some examples of effective EPSS already operating in the Coast Guard. This section provides examples as guides for ADLPOs, designers and developers of EPSS.

- Project Plan Sample
- Design Document Sample
- Functional Prototype Example
- Sample EPSS Storyboards

Project Plan (sample)

USCG Electronic Performance Support Solution

01 August 2011

Version 1.1

Project Manager: Jack Johnson

Approvals:

LCDR Louis Phillips

Project Manager

Steven Vest

COTR (if applicable)

Christopher Robins

Training Manager

LT Sarah Parker

Project Officer

ADLPO: _____

Task Order: _____

Contract Number: _____

Name of Reviewer: _____ Date of Review: _____

Overview

Project Name:	USCG EPSS	Start Date:	30 May 2011
Organization:	USCG Performance Technology Center	Submitted By:	Jack Johnson
Prime Contractor:	Vision Quest	Date Awarded:	15 May 2011
Current Stage of Project:	Ready to develop a performance intervention for the gaps identified in a front end analysis.		
Scope:	Design, prototype, and develop a performance aid for designated systems. This performance aid will cover the tasks associated with operating, troubleshooting, repairing, and maintaining designated systems onboard the WMEC Cutter Class. A pre-design analysis is required to develop step-level data for each task.		

Personnel

Points of Contact

Position	Name / Organization	Phone	E-Mail
Project Manager	LCDR Louis Phillips	(555) 555-5555	Project.manager@uscg.mil
Training Manager	Christopher Robins	(555) 555-5555	Training.manager@uscg.mil
ADL Project Officer	LT Sarah Parker	(555) 555-5555	Project.officer@uscg.mil
Contracting Officer	Michelle Gellar	(555) 555-5555	Contracting.officer@uscg.mil
Contracting Officer's Technical Rep	Steven Vest	(555) 555-5555	cotr@uscg.mil
Digital Solution Consultant	Adam Flowers	(555) 555-5555	Digital.s.consultant@uscg.mil
ADL Program Technical Lead	Henry Davidson	(555) 555-5555	Technical.lead@uscg.mil
Designer(s)	Cindy Boyd Paul Simms	(555) 555-5555	Dee.signer@uscg.mil Di.ziner@uscg.mil
Developer(s)	John Edwards	(555) 555-5555	Dee.velopoer@uscg.mil
Subject Matter Expert(s)	Kevin Arnold	(555) 555-5555	Subject.m.expert@uscg.mil
Solution Lifecycle Manager	William Tell	(555) 555-5555	Solution.l.manager@uscg.mil

Prime Contractor Information

Position	Name / Organization	Phone	E-Mail
Project Manager	Jack Johnson	(555) 555-5555	johnsonj@vquest.com
Senior Management Sponsor	John Jackson	(555) 555-5555	jacksonj@vquest.com
Senior Technical Sponsor	Debra Miller	(555) 555-5555	Millerd@vquest.com

Deliverables

#	Deliverable Name	Start	End	POC
1	Alignment Agreement	30 May 11	5 Jun 11	Johnson/ADLPO
2	Pre-Design Analysis	5 Jun 11	15 Jun 11	Frankfort
3	Project Plan	16 Jun 11	20 Jun 11	Johnson
4	Design Document	20 Jun 11	25 Jun 11	Jackson
5	Design Flow	30 Jun 11	15 Jul 11	Jackson
6	Functional Prototype	20 Jul 11	15 Aug 11	Miller
7	Storyboards	20 Aug 11	20 Sep 11	Jackson
8	Rough Version	1 Oct 11	31 Oct 11	Miller/Jackson
9	Polished Version	15 Nov 11	30 Nov 11	Miller/Jackson
10	Final Version	15 Dec 11	23 Dec 11	Miller/Jackson
11	Acceptance Testing and Validation (including discrepancy report)	24 Dec 11	15 Jan 12	Miller/Customer/SMEs
12	EPSS Source Materials	16 Jan 12	18 Jan 12	Johnson/ADLPO
13	Signed Delivery Agreement	19 Jan 12	19 Jan 12	Customer/ADLPO
14	Deployment	20 Jan 12	22 Jan 12	ADL Program Office

Milestones and Schedule

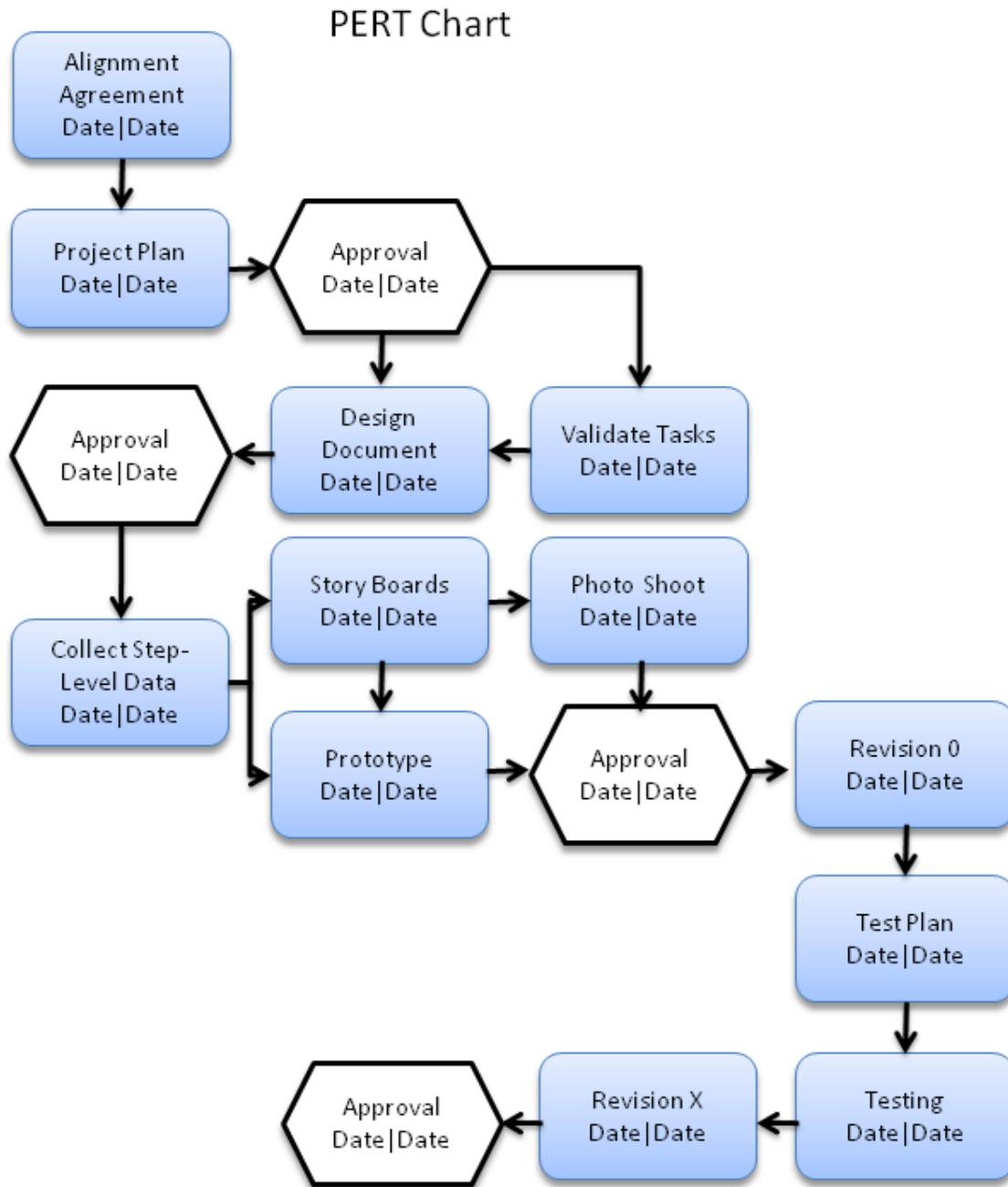
Activity List

Activity #	Activity Description	# of Days	Start Date	Dependency	Milestone
1	Pre-Design	37			
1.1	Conduct kick-off meeting	2			Alignment Agreement
1.2	Validate tasks	10			
1.3	Collect step-level data	20		1.2FS	
1.4	Develop project plan	5		1.3SS	
2	Design	60		1FS	
2.1	Develop design document	5		1.2FS	Design Document
2.2	Construct design flow	10		2.1FS	Design Flow
2.3	Build functional prototype	15		2.2FS	Functional Prototype
2.4	Develop storyboards	20		2.2FS	Storyboards
2.5	Generate shot list	10		2.4SS	
3	Development	60		2FS	
3.1	Conduct photo shoot	10		2.5FS	
3.2	Edit photos	30		3.1FS	
3.3	Assemble Product	20		2FS	Rough Version
4	Evaluation	20		3FS	
4.1	Conduct testing	15		3FS	Polished Version
4.2	Implement final corrections	5		4.1FS	Final Version

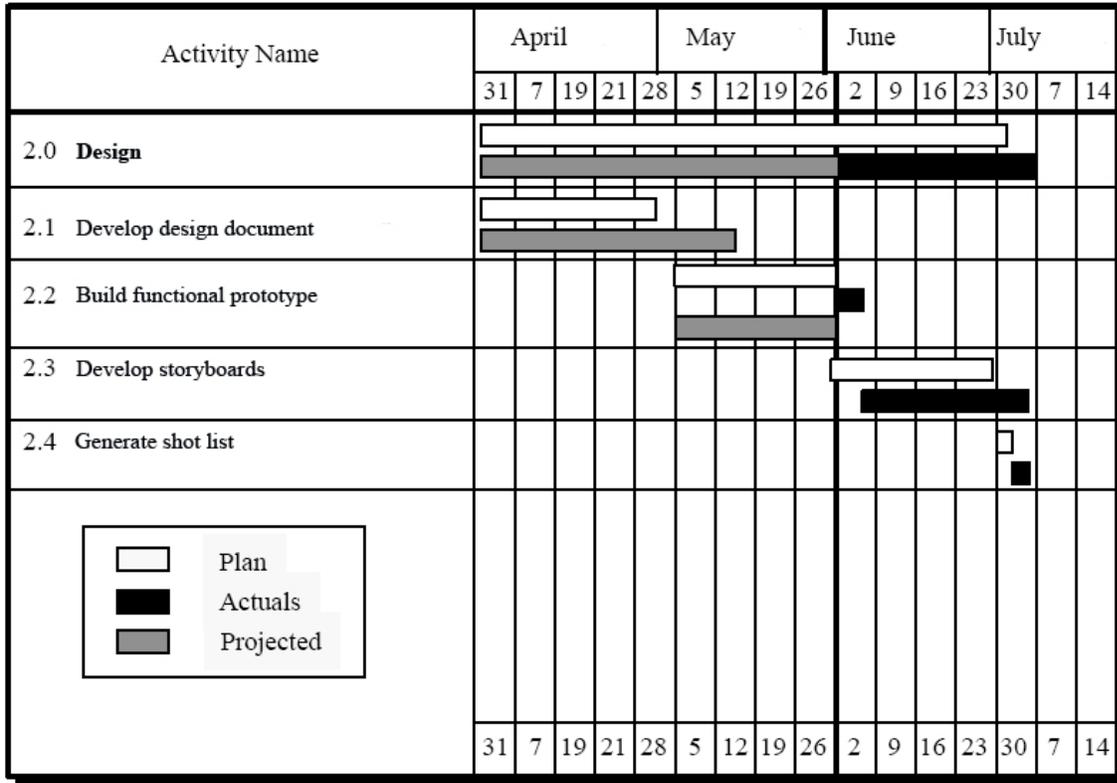
Legend:

- FS The specific task must finish prior to starting the identified task.
- SS Two identified tasks start at the same time, but are not linked to finish at the same time.
- FF Two identified tasks finish at the same time, but are not linked to start at the same time.
- Blank Task has no dependency.
- Lag Additional days can be added for reserve to ensure project stays on schedule.

PERT Chart



GANTT Chart



Cost Breakdown

WBS	Activity Description	Analysis in Hours				
		Budget hours	Actual hours	Est. to Complete	Est @ Complete	Variance (+=More)
2.1	Develop design document	900	1150	1		
2.2	Build functional prototype	430	0	430	430	0
2.3	Develop storyboards	1000	640	408	1048	48
2.4	Generate shot list	600	600	8	608	8
	Total for the Project	3230	2640	847	2336	56

Risk Management

Category	Prob	Imp	Risk	Mitigation Approaches
MANAGEMENT				
Personnel Availability	High	Med	Personnel developed the system did not participate in the design effort, resulting in less understanding of the system functionality	Ensure that specifications/overview documents contain sufficient information to allow new personnel to understand system
Personnel Skills	Low	High	Personnel assigned to project will not have skills to perform work	Since contractor provided quality personnel in design effort, anticipate that skills will be met
Schedule	Med	High	Completed system (i.e., the system ready for use) not delivered within the 18 month timeframe	Break project into smaller segments to ensure schedule being maintained
Cost	Med	High	Proposed budget does not reflect all required activities	Review costing to ensure that all activities are reflected
Change Control	Med	High	System requirements will change during the development time	Ensure that a change control process is established that limits changes to those essential to mission

Quality Management

QA Responsibility

Manager: M. Anderson

Additional Staff for QA:

Support needed by lead design and development members

Planned Quality event: Ensure the QA is implemented throughout the project's life cycle. Dates include QA audits and reviews, design walkthroughs and other project activities QA staff will participate in.

No.	Item	Comments
1.	Requirement Review	Project Plan
2.	Design Walkthrough	System Specification
3.	User Interface Prototype	Test Plan
4.	Testing Audit	Implementation

Ensure that project has a repository for storing configuration items and associated QA records. Briefly describe. QA records are stored with project CM material.

Expected Travel

It is anticipated that three trips will be required to complete this project:

- A 1-2 day trip with manufacturer
- A 3-5 day pre-design analysis meeting at applicable vessel with subject matter expert(s)/accomplished performer(s) to gather validate tasks and gather step-level data
- A 3-5 day trip to field test materials with accomplished performer

The applicable vessel will be in port during the following dates:

- Month/day/year - Month/day/year
- Month/day/year - Month/day/year

Considering vessel availability and project milestones, meeting for pre-design analysis must be scheduled and completed by Month/day/year. Field test dates are based on tentative expected in port dates and will be updated in project progress report.

References

Operating Manuals

TP-4912 R-134A Low Temperature Refrigeration Plant – TYPE 1 Operating and Maintenance Manual

MFG Guides and Manuals

- DirectSoft 32 Quick Start Manual
- C-More Graphic Panel Quick Start
- Graphic Panel EA1 Manual

DESIGN DOCUMENT SAMPLE

Title of EPSS

Agency/Company: _____

Task Order: _____

Contract Number: _____

SUBMITTED: _____
DATE Name and Title of Team Lead

REVIEWED: _____
DATE Name and Title of Project Officer

APPROVED: _____
DATE Name and Agency of Program
Sponsor

Design Document Sample, Continued

Date Submitted

Introduce any reports, interviews, etc. with findings related to performance and performance gaps relevant to the EPSS, identified issues, and scope of the project.

Example: "The *(type of vessel)* are retrofitted with a new system on the vessel. This system is significantly more complex than the unit being replaced and maintenance personnel are experiencing difficulties maintaining the system. An initial installation factory training is provided, but there is no follow-on training provided to the crew when turn over occurs.

The Major accomplishments identified were:

- 1) Operate
- 2) Maintain
- 3) Troubleshoot
- 4) Repair

It is anticipated that the EPSS when developed would not only be provided to the vessels, but would be distributed to *(category of students)* attending the school."

Design Document Sample, Continued

EPSS TITLE

Acronyms

Any acronyms used in the document are listed here. **Examples:**

1. FEA – Front End Analysis
2. EPSS – Electronic Performance Support Solution
3. TTM – Train to Memory
4. JAET – Job Aid with extensive training
5. SME – Subject Matter Expert
6. AP – Accomplished Performer
7. BMP – Best Management Practices

Design Approach

Give a description of the target audience for this performance support tool. **Example:**

"Personnel maintaining the system will be E-4 and above and have attended DC-A school."

Review the data relevant to the project. **Example:** "The full FEA (front end analysis) report can be found on the (*location of website*). 33 tasks were identified in the report, with 4 identified as TTM (train to memory) and 29 as JAET (job aid w/extensive training)."

State the high-level goals and mission requirements. **Example:** "The objective of this EPSS is to allow performers maintaining the equipment to annually recertify their previous factory training."

Discuss how the EPSS will be deployed. **Example:** "The solution will be fully capable of operating either from a web server, running from a CD, or installed on a local computer."

Design Application

List the software that may be used to develop the product, design elements that you will include (such as a Table of Contents or a Glossary of terminology), and any templates that may be used.

Example: "During the design of the tool, it is anticipated that the use of templates, software, and graphics will result in a valuable tool for the Coast Guard. Software may include: RoboHelp, Articulate, Adobe Acrobat, MS Office, PhotoShop, and others as needed. Design will include a Table of Contents and a Glossary of terminology."

Design Content

Include a validated task list. Tasks on this list are drawn from the major accomplishments from the front-end analysis and are validated with the subject-matter expert. **Example:** "The tasks for the Electronic Performance Support Solution (EPSS) will include the following, subject to adjustment as development progresses:

- Identify operational maintenance procedure to perform.
- Test compressor air quality using test kit instructions.
- Inspect air intake filter element.
- Replace pre-filter element.
- Install moisture indicator elements."

List the types of media requirements (photos, videos, animations, or other elements) anticipated to be included in this project. Also, list any media that may be developed and included if during development, additional needs are identified. **Example:** "It is anticipated that the graphics requirements will include photos and additional graphic elements. If during the development additional needs are identified, video or animations may be developed and included."

If applicable, terminal performance objectives (TPOs) and enabling objectives (EOs) can be added here.

Evaluation

Include information on the test and inspection point. **Example:** Deliverables will be inspected for compliance to the ADL SOP. In addition, efficacy, usability, and accessibility (if needed) testing will be performed upon final delivery and feedback will be provided and addressed.

Design Team

List the design team members, including any ranks if applicable. **Example:** "The design team will consist of the following:

Program Sponsor – *(Name and rank)*

Project Officer – *(Name and rank)*

Team Lead – *(Name and rank)*

Advisors – *(Name and rank)*

Development – *(Name and rank)*

Graphics – *(Name and rank)*

Technical Advisor – *(Name and rank)*

Other team members may be assigned as needed."

FUNCTIONAL PROTOTYPE SAMPLE

Title of EPSS

Agency/Company: _____

Task Order: _____

Contract Number: _____

SUBMITTED: _____
DATE Name and Title of Team Lead

REVIEWED: _____
DATE Name and Title of Project Officer

APPROVED: _____
DATE Name and Agency of Program
Sponsor

Example 1

General System Description

The SAREX® 2 GPM Oil-Water Separator is a two-stage gravity-coalescer type device designed to separate and remove non-soluble oil, solids and entrained air from oily water.



The system, which can process oily water at a rate of 2 gallons per minute, is designed for continuous and intermittent operation without the need for chemicals or other additives. After the system has been started, it is capable of automatic operations.

Example 2

2 Turn the Power Switch (26) on the Bilge Alarm Control Module (25) to **ON**. Open

 Exercise caution when power is **ON** while working on electrical components inside the Control Module. Accidental contact with energized components may result in electrical shock or equipment damage. A safety cover shields exposed terminal contacts.

 The following steps should be performed if the inclined plates in the First Stage Separator require cleaning:

 **DO NOT** damage float of switches (4) and (6).

Example 3

 **Design Solutions**
solving your design problems

1234 Main St
Springfield, IL 60528
123-456-7890

Search

Navigation

- [Nulla neque habitant morbi](#)
- [Nullam laoreet commodo](#)
- [Sed vitae nisi lacus enim](#)
- [Curabitur cursus feugiat](#)
- [Proin quis metus erat volutpat](#)
- [auctor mauris interdum quis](#)
- [Quisque sit amet est et](#)
- [viamcorper placerat eleifend](#)
- [viticula elit feugiat vitae](#)

Cras aliquam. Aliquam ultrices dignissim enim. Donec hendrerit magna in libero. Suspendisse accumsan. In sed sapien non lorem lobortis egetas.

Fusce in libero id lacus auctor dignissim. Sed et arcu. Nunc felis enim, dapibus ac, tincidunt nec, feugiat et, dolor. Donec gravida ligula. Nulla a augue.

Fusce porta suscipit eros

Mauris elementum. Proin quis dolor ut augue imperdiet fringilla. In cursus, magna ut eleifend aliquam. Nunc lorem mattis mauris, eu congue nisi nisi et sapien. Donec eget dui. Praesent a diam. Cras nunc. Morbi id orci quis nisl consequat scelerisque.

Duis vitae urna

Aenean ut risus nectellus sodales bibendum. Morbi porta, urna nec aliquam condimentum, sapien lectus elementum est, in placerat elit mi pretium diam. Sed at lectus. Etiam laoreet massa vitae mauris blandit feugibus.

Fusce non ligula

Phasellus sit amet leo. Proin fermentum congue purus. Fusce non ligula. Donec a erat. Curabitur mollis ultrices elit. Ut ut tortor nec metus commodo tristique. In hac habitasse platea dictumst. Donec bibendum, neque non dignissim accumsan, urna felis commodo libero, euismod imperdiet arcu felis tincidunt velit. Duis mollis interdum sem. Nunc volutpat dictum justo.

Donec hendrerit magna

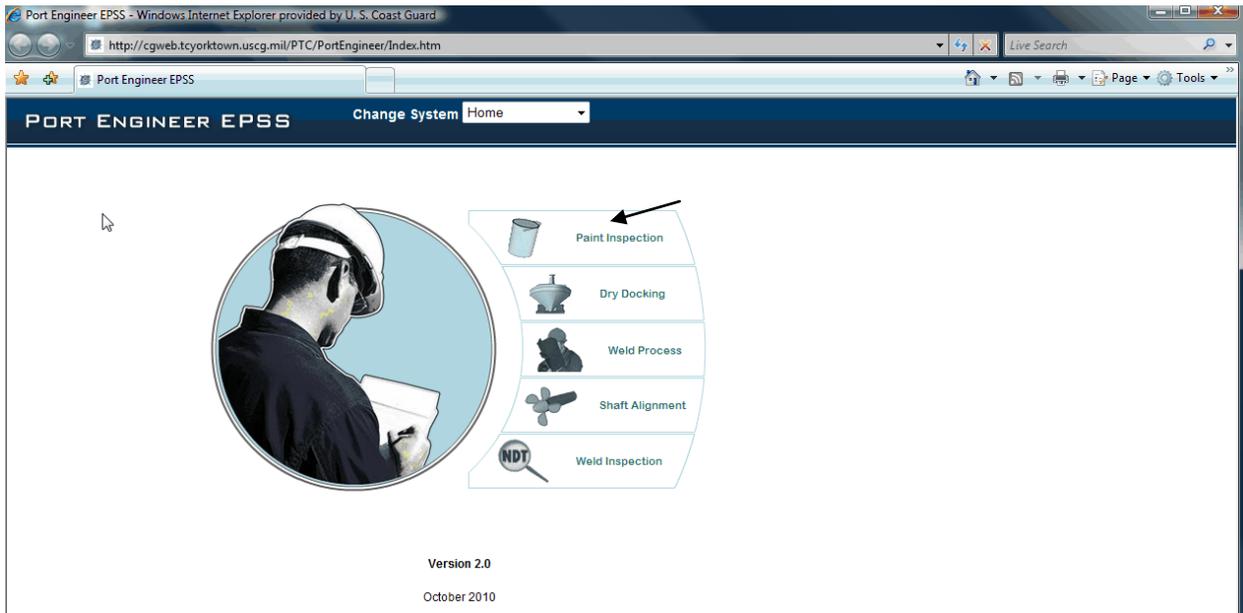
- Nulla sed tortor id neque consectetur auctor.
- Nullam laoreet erat eget nibh.
- Sed vitae nisi non enim semper rhoncus.
- Curabitur ac magna eu elit rhoncus ultrices.
- Proin quis metus nec mauris dictum convalis.
- In auctor mauris quis neque.

Vivamus sodales

- Nulla sed tortor id neque consectetur auctor.
- Nullam laoreet erat eget nibh.
- Sed vitae nisi non enim semper rhoncus.
- Curabitur ac magna eu elit rhoncus ultrices.
- Proin quis metus nec mauris dictum convalis.
- In auctor mauris quis neque.

eget | turpis | metus | rutrum | commodo

Example 4



Version 1.0- (September 2010)

New to EPSS? [Click here](#) for a quick orientation to using the EPSS

Sample EPSS Storyboard

Title of EPSS

Agency/Company: _____

Task Order: _____

Contract Number: _____

SUBMITTED:

DATE

Name and Title of Team Lead

REVIEWED:

DATE

Name and Title of Project Officer

APPROVED:

DATE

Name and Agency of Program Sponsor

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Welcome



Version 2.0
October 2010

[Click here to provide Feedback on this Performance Tool.](#) To download the Feedback Form, **Right click** and select "**Save Target As...**".

Overview

Port Engineer Duties



Your duties, as Port Engineer, include the following:

Evaluate Need	During a normal repair availability, any work item that is included that could affect the shaft alignment should contain provisions for checking the alignment and realigning as necessary.
Review CSMP	If a CSMP has been prepared by the cutter for alignment check due to a suspected problem, review and approve the CSMP. Care should be taken to assure that any applicable vessel alignment drawings or Equipment Manufacturers references are included.
Review of Draft (1) Specification	Once the Draft Specification is released, any alignment related work items should be reviewed for accuracy and adequacy.
Evaluate Contractor Technical Capability	Generally, SLFC specification will require the contractor to demonstrate capabilities for alignment checking or conducting realignment. Some Yards will contract out alignment checks to subcontractors who regularly perform this type of work and have the necessary tools and software available.
Review of Contractor Submitted Alignment Reports	Once alignment checks have been conducted by the Contractor and any required Condition Found Reports (CFRs) are submitted, review the reports and recommendations for concurrence or comment.

Methods

Methods of Alignment



There are **five basic methods** used for shaft alignment:

- [Jack/Load Cell Method](#)
- [Gap and Sag Method](#)
- [Strain Gauge Method](#)
- [Optical and Laser Sighting Method](#)
- [Steel Wire Method](#)

Gap & Sag is used after the shaft is installed, during installation. The methods for final check are Gap & Sag, Jack Load Cell, or Strain Gauge. The final check should be done while waterborne, so, in that respect it is more accurate in evaluating the gear bearing reactions than the pre-installation bearing setting measurement.

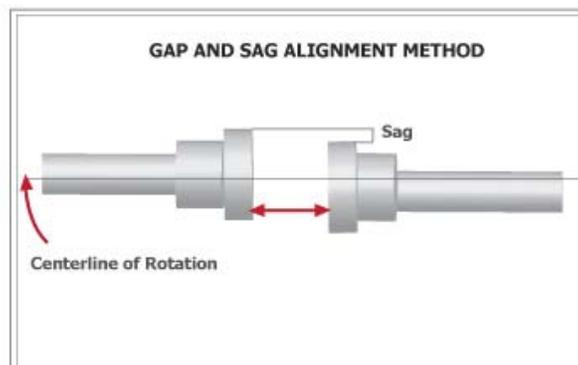
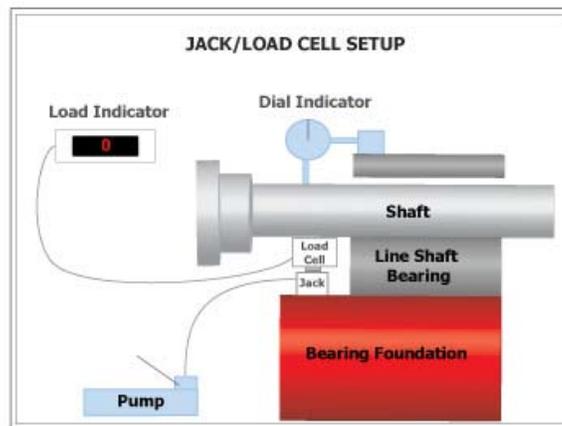
The bearing setting measurement prior to installation of the shaft is important for evaluating cant or skew of the bearing because the post installation of shaft measurements cannot evaluate that and improper cant or skew can cause binding and excessive wear to the bearing.

Jack/Load Cell Method

The **jacking method** lifts the shaft line clear of each bearing in turn by means of a hydraulic jack and calibrated load cell. The shaft is lifted in steps, while deflections are recorded on a dial gauge and plotted against the applied load.

This method uses simple equipment and is employed when the shaft line is coupled up, ready for operation. However, it is not suitable for the control of horizontal alignment and the yard may need to arrange for special supports for the jacks.

Finally, as the jacks have to be positioned beside the bearings, adjustments have to be made to the relevant calculations to evaluate the true bearing load.



Resources

Resources

NTSM:

[S9086-HM-STM-010-Naval Ship's Technical Manual Chapter 243 - Propulsion Shafting](#)

[S9086-HK-STM-010-Naval Ship's Technical Manual Chapter 241 - Propulsion Reduction Gears...](#)

Manufacturers Documentation:

[Caterpillar Marine Engines Application and Installation Guide](#)

SNAME:

[TR 35-51 Propulsion Shaft Alignment Guide](#)

ABS:

[Shaft Alignment Guide](#)

Sample Specifications:

The following are sample specifications used for various cutter availabilities that accomplished work items. These can be viewed as samples, but keep in mind that the cutter had specific circumstances that went into the development of the specification which will vary between cutters.

[49 BUSL Bearing Specifications](#)

[MI 24100 Gearbox to Propulsion Shaft Alignment](#)

[MI 24300 Propulsion Shaft and Flange Face Alignment Check](#)

Glossary

A

Alignment: A condition where the axis or center lines of two shafts are in line or coaxial.

Angular Misalignment: A condition where two shafts are not parallel. The axis or center lines of two shafts intersect at angles to each other.

H

Hydraulic jacking: Moving shaft up and down by the action of a hydraulic jack.

I

Intermediate Shaft: Part of the shafting between tailshaft and trust shaft.

L

L.S. Gear: Low Speed gear.

Lineshaft: Intermediate shaft.

M

ME: Main Engine.

P

Plummer bearing(s): Intermediate bearing(s).

Propulsion: Total of (remedial) actions resulting in an optimum elastic curve of the shafting and/or the result of same work.

Propulsion Shafting: Tailshaft + intermediate shaft + thrust shaft.

USCG Training System SOP 7 Appendix G

Virtual Classroom Guide

I. Appendix Overview

This appendix extends **Training System SOP 7 (ADL)** with a processes and guidelines for establishment of facilitated virtual training sessions and the materials that support these events.

This appendix references other appendices within this SOP as well as other Training System SOP volumes.

The completion of this Appendix has been deferred until 2012.

USCG Training System SOP 7 Appendix H

Combining ADL and Traditional Training

I. Appendix Overview

This appendix extends **Training System SOP 7 (ADL)** with a description of the process and methods used to create blended learning solutions.

This appendix references other appendices within this SOP as well as other Training System SOP volumes.

The completion of this Appendix has been deferred until 2012.

USCG Training System SOP 7 Appendix I

Media Selection

I. Appendix Overview

This appendix extends **Training System SOP 7 (ADL)** with a description of the process and methods used to select appropriate media for ADL solutions.

This appendix references other appendices within this SOP as well as other Training System SOP volumes.

The completion of this Appendix has been deferred until 2012.

USCG Training System SOP 7 Appendix Z

Glossary and References

I. Appendix Overview

This appendix extends **Training System SOP 7 (ADL)** with a glossary of terms and a list of references used in the construction of this SOP.

II. Glossary

Term / Acronym	Definition
accomplished performer	An individual who routinely produces accomplishments at or above standard. Often intended to mean the best performer currently on the job; a person whose skill or performance exemplifies the optimal or desired state. A subject matter expert may or may not qualify as an accomplished performer.
accomplishment	The outcomes or products of individuals and or groups that are valuable to organizations.
ADDIE model	An instructional systems design (ISD) model which employs a systematic approach to training. Each phase has outcomes that provide input for the subsequent phases. The acronym stands for each stage of the process - Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model is the formally recognized ISD model used by DHS Components.
ADL	Advanced Distributed Learning (ADL) leverages the full power of computer, information and communications technologies to tailor instruction and its delivery to support individual/organizational learning needs. ADL is structured learning or performance support that may be self-directed, self-paced, facilitated, or any combination of these access methods.
ADLPO	The ADL Project Officer provides project management and project execution coordination for ADL development efforts.
affective domain	A major area of learning that focuses on acquired attitudes, beliefs, perceptions, and values (e.g., self confidence, responsibility, respect, dependability, and personal relations).

Term / Acronym	Definition
assessment	The act of systematic information collection . This term is often used interchangeably with evaluation but is also used in other contexts such as needs assessment where there is no evaluation context.
audience analysis	An audience profile that describes the nature of employees or students for which a product is being developed. The description can include such characteristics as age, interests, computer abilities, reasons for participating in training, prior knowledge, attitudes toward the organization or work environment, and any other information perceived to be of value to the training team. Also known as “audience profile.”
authoring software	Computer software programs designed to aid in the development of computer-based or web-based training products.
behavior	Any activity (either covert or overt) that the learner will be expected to exhibit after training. The activity should be observable and/or measurable. It is the primary component of a learning objective.
blended learning	Training delivered by multiple delivery systems to take advantage of the benefits of each (e.g., web-based training may be used to provide basics; classroom training may be used to provide hands-on applications; and videoconferencing may be used to provide follow-up and answers to questions).
Bloom's Taxonomy	A classification of educational objectives originated by
branching	An instructional technique in which the student’s next step of instruction is determined by the student’s last response. In automation, the next step may be determined by the pattern of responses to a series of items relating to the subject matter.
CBT	Computer-based training
certification	Verification and acknowledgement that an individual has demonstrated proof to a minimum level of knowledge, skill or competence, as defined by a predetermined set of standards.
chunking	A general method of presenting information. Chunks are information organized into small, manageable units. The theory of chunking is based on memory span and capacity. (Horn, 1990)

Term / Acronym	Definition
cognitive domain	A major area of learning which deals with acquiring knowledge (as opposed to affective or psychomotor skills). It includes the mental processes of perception, memory, judgment, and reasoning.
common learning objective	A learning objective written for a task element (supporting skill or knowledge) that is common to two or more tasks.
competency	Observable, measurable skill, knowledge, ability, behavior, and other characteristics that an individual needs to perform work roles or occupational functions successfully.
concept	A class of people, objects, events, ideas, or actions which are grouped together on the basis of shared critical attributes or characteristics. Concepts represent a group of solid objects, such as an airplane or book or abstract ideas, such as leadership and honesty.
condition	The component of an objective that describes the situation, environment, or limitations in which the learner must exhibit the specified behavior.
consultant	A person who can provide valuable and pertinent advice generally drawn from a high degree of broad administrative, professional, or technical knowledge or experience. When an agency requires public advisory participation, a consultant also may be a person who is affected by a particular program and can provide useful views from personal experience.
correspondence training delivery	Self-study course material: training provided via the assignment of non-interactive methods such as a book, document, regulation, and manual.
cost-benefit analysis	An examination of expected or perceived costs in relation to expected or perceived gains, typically conducted when contemplating new actions or considering new interventions.
COTR	The contracting officer's technical representative (COTR) provides domain specific expertise in the review of delivery increments for any contracted effort.
COTS	Commercial Off-the-Shelf
course	A series of lessons related by a common goal for which student completion is documented.

Term / Acronym	Definition
course map	A chart that depicts the designed sequence of events for a course.
covert behavior	Mental activity usually referred to as thinking. Behavior that is not directly observable but may be inferred from overt behavior that is observable.
criterion-referenced test	A device, technique, or measuring tool that establishes whether or not an individual or group performs the objective to the established standard.
critical task	A task performed by an individual which is essential for mission accomplishment. It is identified through the application of a task selection model.
criticality	A factor used to determine how essential a task is to job performance.
cue	A signal that performance is required. An initiating cue is a signal to begin performing a task or task-performance step. An internal cue is a signal to go from one element of a task to another. A terminating cue indicates task or step completion.
curriculum	A curriculum is a group of training courses or materials for an individual course designed to teach a range of skills and behaviors that are useful in a particular job.
curriculum outline	Curriculum outlines (CO) are required for all USCG resident and nonresident training courses. A standard format documents the performance objectives, training resource requirements, identifies improvements or changes, maintains agreement between performance requirements and training needs, and facilitates the review and approval process.
declarative knowledge	Declarative knowledge tells us why things work the way they do, or that an object or thing has a particular name or location. It includes information about the concepts and elements in the domain and the relationships between them.
deliverable(s)	Any measurable, tangible, verifiable outcome, result, or item that must be produced to complete a project or part of a project. Deliverables are typically subject to approval by the project sponsor or customer.
design phase	The second phase of the ADDIE instructional systems design

Term / Acronym	Definition
	model. The output of this phase is a course design document that specifies the learning objectives, lesson sequence, learning activities/strategies, and instructional media, etc. Test items are also developed.
development phase	The third phase of the ADDIE instructional system design model consists of developing or producing products from the plan (“design”). Typical development work involves completing tests (level 2 evaluations), developing lesson plans, course materials, media, training aids, job aids, case studies, role plays, etc.
difficulty	A factor used to determine how difficult it is to perform a specific task. Task difficulty is often used in conjunction with task importance and task frequency to make determinations as to which tasks should be selected for formal training, which tasks should be job aided or some combination of the two, and which tasks should not be trained.
difficulty-importance-frequency (DIF) model	A task selection model used to determine whether a task should be trained/not trained, job-aided, or learned on-the-job. The three factors used to make the determinations are difficulty, importance and frequency.
distracter/or	In testing, incorrect answers provided as choices in multiple choice or matching test items.
domain of learning	A broad classification of learning types. The three widely accepted domains are the cognitive (thinking, understanding), affective (attitudes, values), and psychomotor (physical skills).
drill and practice	A method of instruction characterized by systematic repetition of concepts, examples, and practice problems. Upgraded verifications of comprehension of enabling objectives (e.g., questions, exercises, and problems).
DSC	Digital Solution Consultant
enabling objective (EO)	A statement in behavioral terms of what is expected of the student in demonstrating mastery at the knowledge and skill level necessary for achievement of a terminal objective (TO).
environment	Environmental influences on performance are the workplace provided factors of policies, procedures, instrumentation, ergonomics, tools, climate, etc. which facilitate the

Term / Acronym	Definition
	accomplishment of a task. The absence of or deficiencies in any of these factors can have an adverse effect on performance.
EPSS	Electronic Performance Support System. Electronic job aids designed to help a worker perform a task or a set of tasks. EPSSs can either be built into the equipment's operating system or can be provided as a stand-alone software application or a handheld data assistant.
evaluation	<p>The systematic process of measuring or observing and judging how well individuals, procedures, or programs have met objectives. The USCG leverages Kirkpatrick's four evaluation levels.</p> <p>See Appendix E, section XIII, Evaluation of Self-Paced e-Learning for a description of each of the levels.</p>
evaluation phase	The fifth stage of the ADDIE instructional systems design model used to determine the value of the instructional program. See also Summative Evaluation, Formative Evaluation.
exercise	An exercise provides a direct or abstract opportunity to practice a skill or apply a concept.
extant data	Records and files collected by an organization reflecting actual employee performance and its results (for example, attendance figures, help desk tapes, callbacks for repair, employee evaluations). Also includes organizational documents such as policy, procedural handbooks and doctrine.
External evaluation	See Summative Evaluation.
facilitator	A learning environment leader who guides individual or team learning in a classroom, laboratory, or practical exercise setting. As opposed to an instructor who provides the learners with information, the facilitator functions more as a coach or guide, eliciting the information or solutions to problems from the learners themselves.
FEA	Front-end Analysis. A component that precedes the first phase of the ISD process (Analysis). In this phase performance deficiencies are confirmed, the job is analyzed, tasks are selected for training, task performance measures are constructed, existing courses are reviewed and the instructional setting is tentatively determined.

Term / Acronym	Definition
feedback	All processes, procedures, and methods by which information is generated and given back to individuals, groups or an entire organization about how well they performed in certain situations.
formative evaluation	Evaluation designed to collect data and information that is used to improve a program, product, or instruction; conducted while the program is still being developed. See also Evaluation, Summative Evaluation.
frequency	A factor used to determine how frequently a specific task is performed. Task frequency is often used in conjunction with task importance and task difficulty to make determinations as to which tasks should be selected for formal training, which tasks should be job aided or some combination of the two, and which tasks should not be trained. See also Task Selection Model, Difficulty-Importance-Frequency (DIF) model.
GFE	Government Furnished Equipment
GFI	Government Furnished Information
goal analysis	A technique described by Robert Mager in which an agreed upon goal is used to determine the learning objectives for a training event. The question “What behaviors need to be exhibited to prove that the trainees have accomplished the goal” is asked. These behaviors are listed in observable or measurable phrases which are then adapted into learning objectives.
GOTS	Government Off-the-Shelf
HPT	Human Performance Technology. A process used to systematically identifying performance problems (both individual and organizational as well as current or potential), analyzing root causes, selecting and designing actions, managing interventions in the workplace, measuring results, and continuously improving performance. Also known as Human Performance Improvement and Performance Consulting.
IETM	Interactive Electronic Technical Manual
IETP	Interactive Electronic Technical Publication
implementation phase	The fourth phase of the ADDIE instructional system design model. The instruction or performance support solution is delivered to the

Term / Acronym	Definition
	learners during this phase.
Importance	A factor used to determine how important a specific task is to the overall occupation. Task importance is often used in conjunction with task difficulty and task frequency to make determinations as to which tasks should be selected for formal training, which tasks should be job aided or some combination of the two, and which tasks should not be trained. See also Task Selection Model, Difficulty, Importance, Frequency (DIF) model, Criticality.
Instruction	The delivery of information to enable learning. The process by which knowledge and skills are transferred to students. Instruction applies to both training and education.
instructional solution	Solution identified from an analysis that are associated with skills / knowledge gaps.
instructional systems design (ISD)	<p>Instructional Systems Design (ISD) is a formal process for producing all types of training. A typical ISD model includes phases; analysis, design, development, implementation, and evaluation. A standard process of design is used so it can be reproduced to achieve consistent and measurable results for continuous process improvement.</p> <p>Also known as the systems approach to training (SAT).</p>
instructional technology	The use of technology (computers, compact disc, interactive media, modem, satellite, teleconferencing, etc.) to support learning.
intervention	The recommendations that are the outcomes of a performance analysis. Interventions are designed to correct a problem or change a situation and improve performance.
job aid	Guides that support performance by helping personnel perform tasks that they do infrequently, that are too complex to memorize, or that are comprised of steps that are critical. Examples: simple checklists, document templates, aviation repair procedures. Job aids may either supplement or replace training. See also Electronic Performance Support System.
JTA	Job-task Analysis. The process of breaking down the complexity of a person's job into duties, tasks, subtasks, and steps that together compose a job. The process goes from the broadest perspective

Term / Acronym	Definition
	(job) to the narrowest (step). The resulting information is used to make training decisions (i.e., job aid task, train the task, do not train the task, train the task on the job).
KO	The contracting officer (KO) is responsible for execution of any contracted effort and has final signing authority for acceptance of any delivery.
learner	One who acquires new knowledge, skills or attitudes which may be obtained coincidentally during daily activities, through self study or by attending a program of instruction.
learning	A change in behavior that can be measured. Learning occurs as a result of knowledge transfer and includes gaining knowledge, skills, or developing new behaviors through study, instruction, and experience.
lesson	A portion of a course which may contain multiple topics with learning objectives and information to be imparted to the student. See also Course.
LMS	A Learning Management System (LMS) is a computer system that automates the administration of training. LMS handles the registration of users, monitors courses in a catalog, records data from learners, and provides reports to management.
mastery	Meeting all the specified requirements for a specified domain of learning (cognitive, psychomotor and/or affective), a combination of each, or all three domains of learning. Some form of measurement is required to determine mastery.
media	A means of conveying or delivering information. Examples of media are paper, film, videotape, broadcast television, computer program, etc. As media capabilities have evolved, specific types of media have emerged within the digital and web-native space such as Flash Media (interaction transport) and 3D Interactions (real time representations of geometry),.
model	A representation of a system that analyzes or depicts a process which leads to insight. (i.e. diagram, flowchart, template or job-aid).
module	A stand-alone instructional unit that is designed to satisfy one or more learning objectives. It is a separate component complete

Term / Acronym	Definition
	within itself that can be taught, measured, and evaluated for a change, or it can be bypassed as a whole. A module can be interchangeable with other modules and used for assembly into units of different size, complexity, or function. A module consists of one or more lessons.
motivation	The personal desire to perform. It is comprised of both value and confidence. Value is knowing why desired performance is important and confidence is the belief by the member that they can do it.
MT	Mandated Training (MT) is required by regulation, law, statute or executive order. Agencies have an obligation to identify, monitor and record completion of these requirements.
needs analysis	Micro level analysis leading to identifying causes for the discrepancies. This process considers solutions and problem resolution. Determines the nature and relationship of needs. Includes the process of breaking needs down and suggesting causes of and solutions to needs. The process may use many data-gathering techniques to discover needs expressed by management, job performance analysts, the target audience, or Subject Matter Experts.
needs assessment	Macro level assessment leading to identifying discrepancies which is future-focused. It results in problem identification stage and provides substance and meeting to needs. The process of identifying and prioritizing needs between current outcomes and desired outcomes. Needs assessment solutions places gaps in priority order for resolution based on the consequences and/or cost to meet the need as compared to the risk and cost of ignoring it. Needs assessment leads to needs analysis.
OA	Occupational Analysis
objective	A specifically defined ability or outcome gained as a result of a planned activity. There are specific types of objectives intended for desired outcomes, including terminal, enabling, and performance objectives.
OJT	Structured On-the-Job Training (OJT) is an activity where knowledge, skills and abilities are attained at the worksite by use of a qualified OJT Monitor/instructor who introduces tasks in a

Term / Acronym	Definition
	<p>priority sequence of activities, provides feedback, and measures and evaluates outcomes. Formal OJT can yield a productive member of the organization in an efficient and cost effective manner.</p> <p>Unstructured On-the-Job Training (OJT) is an activity where knowledge, skills and abilities are attained at the worksite by employees without a planned, measured or a monitored approach. Unstructured OJT lacks consistency and outcomes may be unpredictable.</p>
pedagogy	The art and science of educating children and embodies teacher-focused education.
performance analysis (PA)	<p>A process applied to the study of the behavior of individuals or organizations to determine the use of appropriate techniques to improve performance. Results of the PA can be used to identify training solutions. The outcome of a PA is a comprehensive list of recommendations to eliminate performance gaps. A PA can take anywhere from a few days to several months to complete, depending upon their complexity and the resources available.</p> <p>See FEA, JTA, and OA.</p>
performance improvement	A process of discovering and analyzing gaps, planning for future improvements in performance, designing and developing cost-effective and justifiable interventions to close performance gaps, implementing the interventions, and evaluating the monetary and organizational results.
pilot	A trial run of a course, class, curriculum, program and/or test instrument that provides information to improve or revise a product or process.
practice	A systematic performance of task(s) to gain proficiency using one or more domains of learning.
pre-design	The pre-design phase validates method selection and provides critical inputs to the statement of work and the design phase. These inputs include details about the audience, performance requirements, detailed task data including step level detail, and training requirements.

Term / Acronym	Definition
pre-design analysis	The pre-design analysis bridges the gap between the performance analysis (FEA) and the design of a training solution. Inputs to the pre-design analysis includes available analysis data and recommendations, audience analysis data, and performance requirements. The pre-design analysis focuses the scope of the solution and may uncover critical elements including cognitive tasks.
pretest	A test to determine current level of knowledge and skills prior to entering into a learning environment typically used with post tests to compare entry knowledge with exit level knowledge.
problem statement	A detailed definition of a performance problem (with supporting evidence) that intervention(s) can be designed to remedy.
procedural knowledge	Procedural knowledge tells how to perform a given task. It contains the discrete steps or actions to be taken and the available alternatives when performing a given task. With practice, procedural knowledge can become an automatic process, thus allowing people to perform tasks without conscious awareness.
procedure	Sequence of steps that result in completion of job task(s).
process	A planned series of actions having input(s) and output(s) that advance a material or procedure from one stage of completion to the next to achieve the intended result.
proficiency	Ability to consistently perform a specific behavior (e.g., task, learning objective) to the established performance standard.
program of instruction (POI)	A component of curriculum that provides an outline or matrix of course content to be delivered in a specific sequence for the efficient and effective achievement of objectives.
prompt	A prompt is a word or signal that initiates or guides behavior.
prototype	A functional version of a new process and/or product, usually in an unfinished state, whose effectiveness and efficiency will be tested. The version is then revised, improved and then implemented.
psychomotor domain	A major area of learning which deals with acquiring the ability to perform discrete physical skills requiring dexterity, coordination, and muscular activity.

Term / Acronym	Definition
PWS	Performance Work Statement. See also Statement of Work (SOW).
quality assurance (QA)	A process used to monitor, evaluate and report the adherence to processes, procedures and standards to determine if training programs, courses, instructors and products meet certain predetermined standards.
remediation	A process that provides supplemental instruction in order to correct learners' performance or to reinforce learning objectives.
requirement	Function that must be part of the program or system based on the needs analysis, analysis of the target population, and job and task analyses.
response	Any behavior that results from a stimulus or stimuli. This may involve a single word response, selection among alternatives (multiple choice), the solution of a complex problem or the manipulation of buttons or keys.
RFA	Request for Analysis
risk mitigation	Risk mitigation is the part of the planning process that seeks to reduce the probability or impact of a risk below an acceptable threshold. This may include a variety of risk avoidance strategies to eliminate risk and protect the project objectives from the impact of the risk.
scaffolding	A technique used by curriculum designers and instructors to facilitate student learning; as the term implies, instructors initially provide a considerable amount of support (feedback explanations, demonstrations and prompts of various types which can include visual, audio and tactile). As students demonstrate their ability to carry out more of the task(s) independently, the instructor minimizes feedback (scaffolding).
scenario	Scenarios situate learning in authentic contexts. Scenario-based exercises are based on the concept of situated cognition. This implies that knowledge cannot be internalized independent of context (Kindley, 2002).
SCORM	Sharable Content Object Reference Model
simulation	A realistic representation of a system, subsystem, situation, or device. Simulations provide an opportunity for the student to

Term / Acronym	Definition
	practice procedures, tasks, or problems in approximation to real-world scenarios.
skill	The ability to perform a psychomotor or intellectual activity that contributes to the effective performance of a job task. See also Psychomotor domain.
SLM	Solution Lifecycle Manager
SME	Subject matter experts (SME) provide domain expertise that helps to define the content and context for ADL solutions.
soft skills	A set of skills that influence how we interact with each other; including but not limited to effective communication, creativity, analytical thinking, diplomacy, flexibility, change readiness, and problem solving, leadership, team building, and listening skills. The goal of soft skill training is to give students opportunity to learn and practice new patterns of behavior and in so doing to enhance human/organizational relations.
SOW	Statement of Work. See also Performance Work Statement (PWS).
SPeL	Self-Paced eLearning is defined as instruction that leverages technology to deliver learning solutions that support Coast Guard mission requirements and are accessible anytime, anywhere.
standard	The minimum level of acceptable performance.
step	The smallest, clearly delineated part of a task. Steps are usually executed in sequential order, but are not necessarily contiguous. See also subtask.
stimulus	Anything that provokes behavior. The event, situation, condition, signal, or cue to which a response must be made.
storyboard	A series of diagrams or illustrations which support the sequence of content and/or action that will be contained in an project; includes such elements as images, animation, movie segments, sound, text, and navigation aids/paths.
strategic knowledge	Strategic knowledge is composed of information that is the basis of problem solving, such as action plans to meet specific goals, knowledge of the context in which procedures should be implemented, actions to be taken if a proposed solution fails, and

Term / Acronym	Definition
	how to respond if necessary information is absent.
subtask	Provide information, directions, and activities in the order in which they should be performed. The procedures or small work activities that perform together make up a task. May also refer to concepts required to successfully make task decisions.
summative evaluation	A form of evaluation designed to follow a formative evaluation to obtain data regarding student performance, worth of the program or product and to make recommendations for improvements.
survey	The collection of information from a common group through interviews, questionnaires and other means to a representative sample of that group.
syllabus	An official outline of all courses that comprise a specific training program. It may include: <ol style="list-style-type: none"> 1. Prerequisite requirements for attending the program; 2. An outline for each course that shows the lecture, laboratory and practical exercise hours, objectives and method(s) of evaluation; 3. Graduation or program completion requirements, including but not limited to a matrix showing the number of written examinations and practical exercises; number of allowable remedial written examinations and practical exercises; and minimum score or standard required to pass each written examination and practical exercise.
synthesis	Level of cognitive domain (Bloom, 1956) in which students are able to put parts together to form new patterns or structures.
system	A group of objects or units combined to form a whole and to work together to achieve results not possible from the individual parts.
target population	A segment of a population with some commonality (e.g. experiences, credentials and/or education) that is to be analyzed and receive tailored instruction.
task	The smallest essential part of a job; it is a unit of work activity that is a logical and necessary action in the performance of a job. A task has an identifiable start and end point, and it results in a measurable accomplishment or product.
task analysis	The action of defining the smallest essential part of a job— the

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	<p>task—and breaking it down into its subtasks. The purpose is to get to the basic learning objectives that must be accomplished for the learner to improve his or her performance. Gathering this information may involve observation and careful interviewing of both expert and novice. Task analysis information can be used as the foundation for developing instructional objectives, identifying and selecting appropriate instructional strategies, sequencing instructional content, identifying and selecting appropriate instructional media, and designing performance evaluation tools. It is always done in the context of a specific job.</p>
task conditions	<p>Condition or circumstance under which a task is performed, including the physical environment and resources provided. They are used in task analysis and when designing criterion referenced objectives i.e. task, conditions, standards.</p>
teaching point	<p>The smallest increment of information to which a learner may be expected to respond; a statement of fact or a procedural step in the performance of a task; the precise information you want a learner to know or respond to.</p>
template	<p>A pre-built document used as a pattern in a development process.</p>
terminal objective	<p>A terminal objective describes what learners will be able to do at the end of their training.</p>
test item	<p>A component of a test which requires a response by the test-taker and which is scored separately. Items are combined in a test to measure a student's learning or performance.</p>
topic	<p>The basic organizational unit of instruction covering one or more closely related learning objectives.</p>
trade and craft training	<p>Training in the knowledge, skills, and abilities needed in such fields as electronic equipment installation, maintenance, or repair; tool and die making; welding, and carpentry.</p>
training aid	<p>Any device, method, or experience used to enhance a learning experience, to include, but not limited to technology, print media and other sensory materials.</p>
transfer of training	<p>The ability to effectively apply knowledge and skills from training to the employee's job.</p>

Term / Acronym	Definition
t-test	When comparing means from two groups, a t-test is used to determine the level of significance between them. Often used in comparing results from pre- and post-test evaluation results.
tutorial	An instructional activity in which information is presented or a skill is modeled for transferring a knowledge or skill. Tutorials are effective for presenting facts, rules, principles, or strategies. Practice and assessment are typically included in a tutorial.
unguided simulation	Unguided simulation is essentially a learning simulation in which learners receive no coaching or feedback until after the simulation ends. Unguided simulations typically follow guided simulations.
VT	Virtual Tour
VTT	Virtual Task Trainer
WBT	Web-based training
workbook	A handout that contains procedures and exercises designed to assist the learner in achieving the learning objectives.
WT	Workforce Training

III. References

Comparing Learning, Training, Education, and Professional Development

Activity	Purpose	Time Frame	Management Risk
Learning	<p>The result of well structured and well targeted training, education, or professional development.</p> <p>This refers to an activity undertaken by the learner or performer either in a formal environment or through independent exploration.</p>	Life Long	<p>None-to-Low</p> <p>As the result of several activities including natural learning inside and outside the workplace, poor practices may be internalized.</p>
Training	<p>A planned, structured event that sequences activities to efficiently achieve desired objectives.</p> <p>Often used to consistently assist new members become productive members.</p> <p>Promotes unity of effort and common organizational culture.</p> <p>Tends to be task / skills oriented.</p>	<p>0 – 3 years per event or event series</p> <p>Formative period is perceived to be most beneficial to organizations.</p> <p>As needed to address dynamics of technology, organization, expertise progression, and processes.</p>	<p>Low</p> <p>Competency based, typically includes measurements and approaches all three learning domains.</p>
Education	<p>Sustains and advances performance and values organization wide by providing deeper exposure to knowledge and skills.</p> <p>Tends to focus on the cognitive domain.</p>	<p>3 – 5 years in the typical life cycle</p> <p>Required and recommended items are usually identified in career development plans.</p>	<p>Medium</p> <p>Viewed as short-term investments in the future. Used to prepare staff for planned future positions.</p> <p>Upon completion employees may be more qualified for competing entities or organizations.</p>
Professional Development	<p>Enhances professional trade, leadership, management, and interpersonal skills (soft skills) to advance or continuously improve the workforce, the organization, and work processes.</p>	<p>Life Long</p> <p>Usually 5+ years and beyond; focused at the middle / upper management or specialized skills level.</p>	<p>High</p> <p>Viewed as long-term investments in the ultimate future of the organization. Equips employee to cope with future forces of change or performance requirements.</p>

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