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

Volume 7

Advanced Distributed Learning (ADL)

Office of Training, Workforce Performance & Development (CG-132)
Human Resources Directorate

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SECTION I: INTRODUCTION

Introduction

This SOP describes the process by which Coast Guard Advanced Distributed Learning (ADL) is identified, requested, designed and developed, implemented, and maintained. It defines the process, the players, and the requirements for initiating an ADL solution; the milestones in project development, piloting, and implementation; and the requirement for an associated lifecycle maintenance plan. Appendix A, "United States Coast Guard Asynchronous Web-based Learning Standards and Styles Guide," contains the technical standards that guide asynchronous web-based learning development. Variations from this process, procedures, and standards must be approved by CG-1325.

SECTION II: PURPOSE

Purpose

The purpose of this SOP is to ensure that the Business Rules of CG-132 are promulgated and inculcated into the ADL program. The rules are:

- Identify opportunities for the conversion of all or part of existing resident courses to ADL.
- Partner with Program Owners to create or convert General Mandated Training courses to gain high-visibility successes and help shape the culture.
- Market and engage Program Owners to create a "pay as you go" basis for new ADL products.

In accordance with COMDINST 1554.2, CG-132 provides and ensures funding is provided for the ADL infrastructure on which all products covered by the SOP reside.

This SOP was developed to ensure that ADL development follows a Human Performance Technology analysis and produces products that focus on work accomplishments for the Coast Guard. Although Appendix A defines the technical development requirements for asynchronous web-based learning, this SOP also includes these additional ADL products and tools:

- Instructor Facilitated e-Learning
- Web-based and Part-Task Simulations
- Electronic Performance Support Systems (EPSS)
- Interactive Electronic Technical Manuals (IETM)

Documents that set standards for development of these additional ADL assets will be forth coming.

Continued on next page.

SECTION II: PURPOSE (continued)

Purpose (continued)	This SOP does **not** cover development and management of high fidelity simulations. The process for acquiring and developing ADL is intended to link with other training processes and policies supporting USCG human performance. It is also intended to enable USCG learners to maximize their learning experience. This SOP identifies, promulgates and standardizes the process in which an ADL solution is developed within or for the Coast Guard. It will: • Explain how to initiate a request for ADL development • Provide a technical standard for the development of products • Enable consistent outputs for any organization developing such products • Provide guidance to Programs in planning for the maintenance of the products • Describe the process by which training managers and clients will identify the metrics and reports they need in order to make decisions regarding the ADL product

SECTION III: INTENDED AUDIENCE

Intended Audience	The audience for this ADL SOP includes all members of the Coast Guard who have a need to develop and deploy ADL solutions for documented needs (Reference: Analysis SOP - http://www.uscg.mil/tcyorktown/PTC/sop.shtm). These members include Human Performance Technology practitioners, Training Program Managers, Clients, contractors, and others who embrace the efficient delivery of web-based performance support.

SECTION IV: MISSION

Background	Since the United States Coast Guard began delivering learning across the internet and intranet in 2000, the ADL organization and infrastructure have matured. A primary theme during maturation has been the unification of ADL with support of Coast Guard human performance. Specifically, it centered on how ADL can be used to meet critical performance support objectives, how ADL business processes could be aligned with other training processes (including performance analysis, curriculum design, and evaluation), and, finally, identifying how products can be successfully mounted and hosted on the USCG learning management system (LMS). Recognizing the unique resourcing, maintenance, accessibility requirements, and alignment with other USCG e-business processes, Coast Guard ADL is integrating approaches that make sense in managing and appropriately sustaining ADL so that it better serves the missions and operations of USCG.

SECTION IV: MISSION (continued)

Underlying Philosophy

The underlying philosophy of Coast Guard ADL is that it should either directly enable people to perform or provide information that enables people to perform. These general learning tenets should guide all ADL work developed for the United States Coast Guard:

- Transfer of training to work performance is the desired outcome of any Coast Guard training. "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)
- Transfer is most effective when the elements of the work situation are brought into the training in ways that (a) closely emulate the environment, (b) allow learners to engage in the work performance, (c) allow learners to experience the consequences of the work performance, and (d) allow the kind of variation in the work environment that demands the learner to adjust the performance.
- ADL can be structured to emulate and simulate these experiences. Use of text-based screens when it does not emulate the work situation or required response should be minimized.
- Key performances must be tested in ADL and recorded to the database. Text-based testing must be approached with caution due to the reasons stated in bullet 2 above.

General Criteria for USCG ADL Interactivity

Coast Guard ADL interactivity should be appropriately interactive to enable learners to perform. Here are the general criteria governing interactivity:

- Construct the screens to be purposefully interactive. As much as possible learners should have the opportunity to perform what is being taught on the screen.
- Limit page-turning and minimal approaches to interaction. Use these only to set the stage for more purposeful interaction.
- Emulate key stimuli the learner will encounter in the work environment.
- Allow the learner to take the correct, authentic action in response to the stimuli.
- Allow the learner to learn to distinguish the relevant stimuli from distractions or other salient stimuli that would lead the learner to an incorrect action.

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SECTION IV: MISSION (continued)

General Criteria for USCG ADL Interactivity (continued)

- Allow the learner to experience some form of the consequences of the action.
- As much as possible, integrate lower-level behaviors into a fuller simulation of the task within the environment in which the tasks would be performed. The situations should be authentic, the opportunity to interact similar to the type of action that would take place in an authentic environment, and the consequences to actions similar to those which would be experienced in the authentic environment.

SECTION V: USCG ADL BUSINESS PROCESSES TO BE FOLLOWED

ADL Business Processes

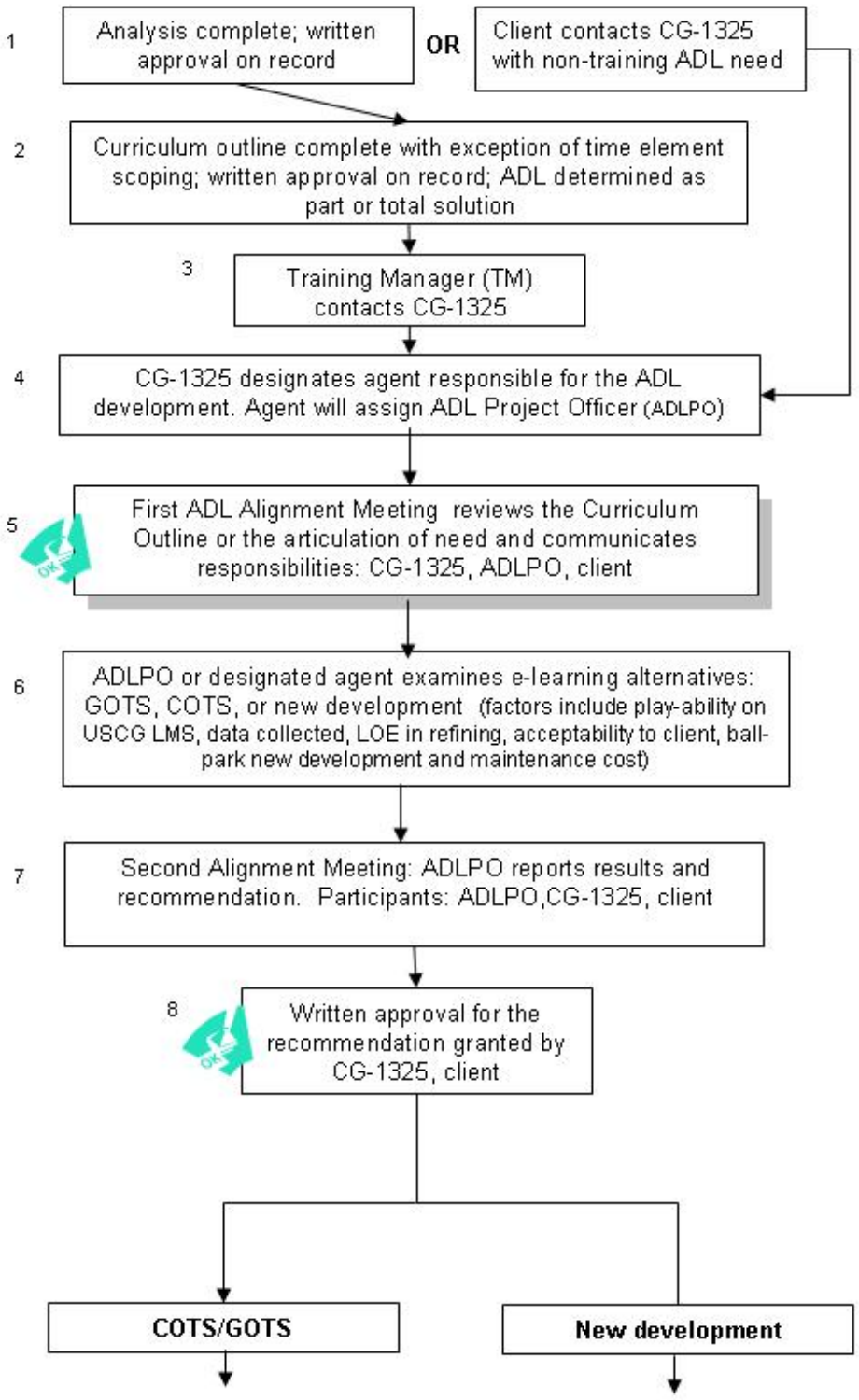
The ADL business process is intended to ensure alignment with other USCG training and performance support processes. It is also intended to ensure that all stakeholders have input and approval of critical milestones so that the final product delivered is evaluated as acceptable for Coast Guard ADL use.

The process has three phases: decision, development, and verification, validation, and acceptance (VV&A). Figures 1, 2, and 3 show the process flow. Table 1 details each step along with the participants, actions, and approvals.

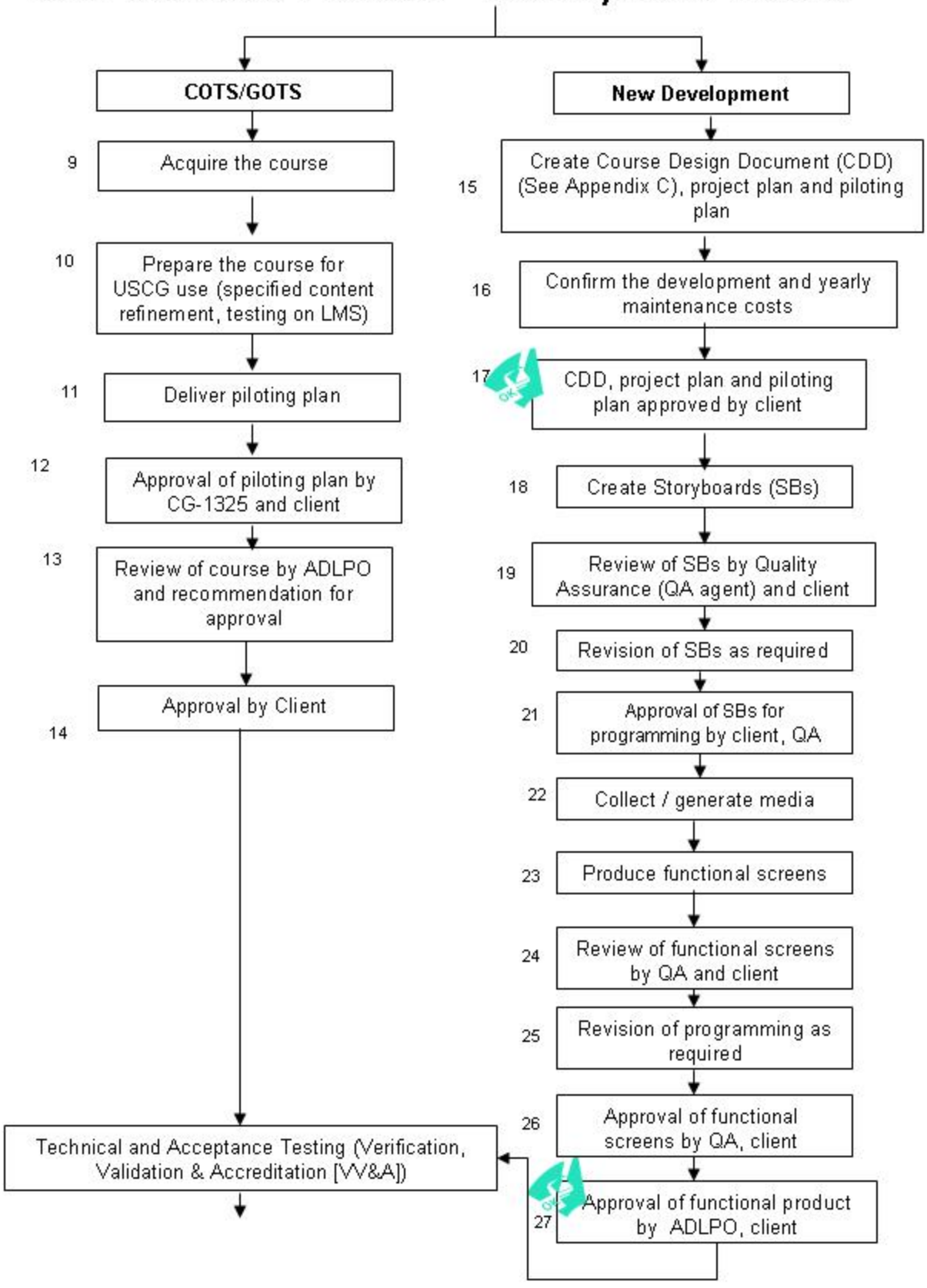
The appendices contain the control documents and criteria for specific deliverables in the process. All control documents cited in the workflow must be on file with the correct approvals before further work on a specific ADL project can proceed or be accepted.

ADL Business Process – *Decision Phase*

= approval required before further action can be taken



ADL Business Process – *Development Phase*



E-learning Business Process – *VV&A Phase*

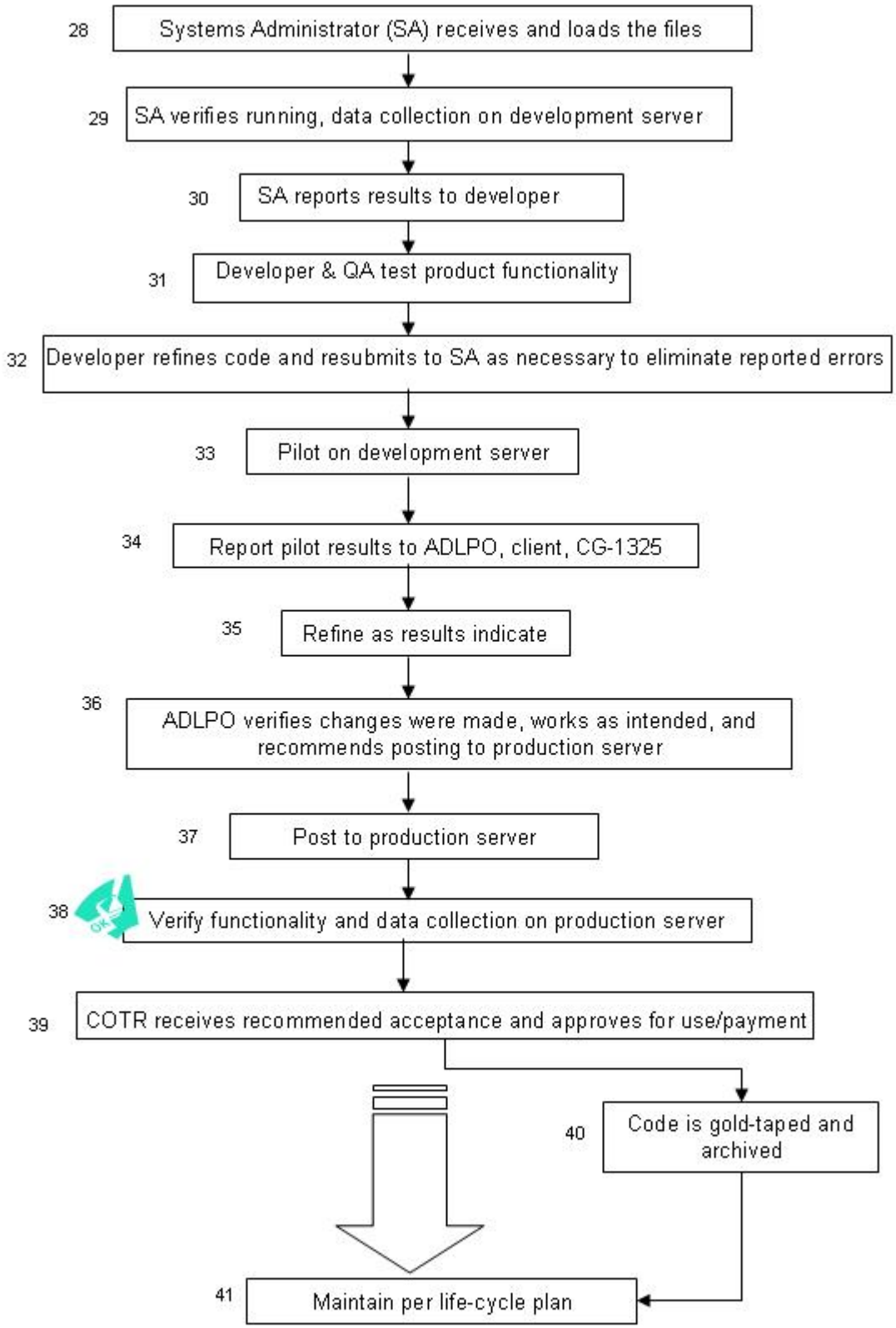


Table 1 ADL Development Workflow Detailed Steps
NOTE: If ADL request is a non-training solution, begin with Step 3

Step #	Description	Participants	Actions	Approval
1	CG 1321 and client finalize the analysis	CG1321 and client	CG 1321 and client approve analysis as basis for further work.	
2	CG-1322 Training Manager (TM) agrees that the Curriculum Outline is acceptable; ADL determined as part or total solution	CG-1322 and client	CG-1322 approves the outline as a basis for development of course materials.	
3	TM contact CG-1325	TM and ADL Program Manager (CG-1325) or designate	TM request meeting to explore ADL solutions and identifies stakeholders to be included in meeting. CG-1325 arranges meeting.	
4	CG-1325 designates agent responsible for the development effort. ADL Project Officer (ADLPO) is assigned.	CG-1325 and designated agent	CG-1325 queries development cells (PTC, IST or other ADL manager) and designates responsibility. Manager assigns ADLPO who manages the ADL development effort and maintains the audit trail.	
5	First ADL Alignment meeting to review Curriculum Outline and communicate responsibilities.	CG-1325, ADLPO, client and other identified stakeholders	Principals discuss the request and obtain preliminary information about the client, intended behaviors, and project outcomes. Reporting requirements are determined including the required data collection and report formats. Alignment Agreement is completed by ADLPO and signed by significant parties. (See Appendix B).	√
6	ADLPO or designate examines COTS/GOTS availability	ADLPO or designate	ADLPO researches alternatives, provides a Cost Benefit Analysis Plan (CBAF), and makes a recommendation.	
7	Second Alignment Meeting to decide on course of action.	ADLPO, CG-1325, client	ADLPO makes presentation, fields questions. Solution is identified. Client/CG-1325 ensure funding is in place.	

Table 1 ADL Development Workflow Detailed Steps

8	Written approval for identified solution.	ADLPO, CG-1325, client	Alignment Agreement is completed by ADLPO and signed by significant parties. (See Appendix B).	√
Development – COTS/GOTS				
9	Agreement to acquire the course	ADLPO and client. There may be a payment required here.	ADLPO negotiates with the owner, documents the terms, signs agreement, receives the code and other documentation.	
10	Prepare the course for USCG use (content changes, test on the LMS, etc.)	ADLPO or designate	ADLPO manages the modification of product for USCG use and evaluates the results.	
11	Deliver the piloting plan	ADLPO	ADLPO documents the method, sampling, data collection, analysis and reporting plan. Delivers the plan for review.	
12	Approval of pilot plan	CG-1325, client	ADLPO delivers plan and fields questions. Client and CG-1325 give approval.	
13	Final review of course and changes.	ADLPO or designate, client	Review of course for accuracy, scoring, calls to database as intended, remediation screens, viewing as intended and opening/closing within the LMS interface.	
14	Approval by client	Client	ADLPO sends recommendation for approval to client and copies CG-1325. Client evaluates and approves.	
Development - New				
15	Create Course Design Document (CDD), project plan and piloting plan	ADLPO or designate (possibly contractor)	See Appendix C for required elements of CDD. Delivers project plan with milestones and piloting plan.	

Table 1 ADL Development Workflow Detailed Steps

16	Confirm development and maintenance costs	ADLPO, client	Based on the CDD, confirm or recalculate the cost. If there is an upward change greater than 10% or original estimate, obtain written approval to continue the project.	
17	Approval of CDD, project plan and pilot plan	CG-1325, client	ADLPO provides recommendation for approval to client and CG-1325. Client approves.	√
18	Create Storyboards (SBs). Review by client and Quality Assurance (QA) designate.	Developer (internal or contractor)	Create SBs in accordance with the CDD and the CG ADL Asynchronous Web-based Learning Standards & Styles Guide (AWLSSG). (See Appendix A).	
19	Storyboard review	QA, client SME	Review by client SME and QA designate. Comments provided to developer.	
20	Revision of SBs as required with review	Developer, QA, SME	Revised SBs reviewed for changes by QA and client SME. Recommendation to client to proceed with development.	
21	Approval of SBs by client	Client	Upon recommendation by QA and SME, client approves the SBs for development into functional product.	
22	Collect or generate media	Developer/Design team	Collect and generate media. Prepare for input IAW AWLSSG. (See Appendix A).	
23	Produce functional screens	Developer/Design team	Input SBs into functional product, add SCORM metatags, develop testing mechanism for SCORM and 508 compliance, test and retain logs, develop scoring mechanism.	
24	Review of functional screens	QA, client SME	Deliverable is compared with guidance of the CDD and the AWLSSG. SME examines the content delivery. Feedback provided to the Developer.	
25	Revision of programming	Developer	Developer incorporates changes into functional screens.	

26	Approval of functional screens	QA, client SME	Revised screens examined for accurate changes. Release to client for review with recommendation for approval.	
27	Approval of functional product	ADLPO, client	Approval to developer for delivery to the CG System Administrator (SA) for testing and piloting.	
VV&A				
28	SA receives and loads files	SA	Developer delivers the files IAW the guidelines in the AWLSSG to SA who loads and tests.	
29	SA verifies running, data collection on the development server	SA	Runs the files to verify running and sending data calls to the LMS.	
30	SA reports results to the developer	SA	SA sends the report to the developer and copies the ADLPO.	
31	Test of functionality	Developer, QA	SA makes the product available on the development server to the developer and QA to test functionality.	
32	Developer makes any corrections and resubmits to the SA	Developer, SA	Developer makes necessary changes. SA reloads and tests. Report of results is sent to the developer with copy to the ADLPO.	
33	Pilot on development server	Developer, ADLPO	The pilot plan is executed and documented.	
34	Pilot report delivered to ADLPO, client, CG-1325	Developer, ADLPO, CG-1325	ADLPO and client evaluate to determine if further revision is needed before distribution.	
35	Revise as indicated	Developer	Developer revises and tests as necessary. The ADLPO and client review changes.	

Table 1 ADL Development Workflow Detailed Steps

36	Verify changes	ADLPO	ADLPO verifies that any changes were made correctly and requests posting product to the production server.	
37	Post to production server	SA	SA moves to the production server and notifies the ADLPO.	
38	Verification of functionality and data collection	ADLPO, CG-1325, client	ADLPO or designate reviews functioning on the production server. Reports are pulled and verified to represent the client's requirements for reporting. CG-1325 and client are notified that functioning is accurate. CG-1325, client give approval for wide-release.	
39	COTR receives recommendation for acceptance of product	ADLPO, COTR, contractor	ADLPO gives recommendation to COTR for product approval and subsequent payment (if applicable). Contractor delivers all source files to the ADLPO.	√
40	Functional product and source files are gold-taped and archived	ADLPO, SA	ADLPO requests gold-taping and archiving. SA gold-tapes and archives and verifies action with ADLPO.	
41	Maintain per life-cycle plan	ADLPO, client	Life-cycle plan is implemented per CDD. Client receives required reports from the LMS. ADLPO works with client to obtain updates per life-cycle plan and client provides funding.	

United States Coast Guard Asynchronous Web-based Learning Standards and Styles Guide

March 20, 2007

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Overview

Introduction

This U.S. Coast Guard e-Learning Standards and Styles Guide (ESS) is for developers of Coast Guard e-learning courseware and electronic tools. So that Coast Guard people should see one system with interoperable components, this Guide endeavors to provide a flexible framework for development while maintaining interoperability of asynchronous e-learning products.

Coordinating with the USCG e-Learning Program Office, the assigned USCG project manager at the Performance Technology Center (PTC) at Training Center Yorktown (which maintains this Guide) or at the Instructional Support Team (IST) at Training Center Petaluma certify e-learning assets developed in accordance with these standards as "Coast Guard e-Learning" products. These courses and tools with this certification shall have the "Certified Coast Guard e-Learning" brand on the home page or splash screen.

USCG is part of the Department of Homeland Security (DHS). Care has been taken to coordinate the standards and styles described in this Guide with those of DHS. Also, the USCG works closely with the Department of Defense (DoD) through the Joint Advanced Distributed Learning Lab (JADL). Care is also taken to align this document with JADL standards. In all cases, where interpretations of standards published by each of these organizations are viewed as differing, the USCG Program Manager will determine the interpretation and standard to be applied to the specific project.

If you are reading this from a Coast Guard Standard Workstation, you probably work for the Coast Guard; for internal development assistance, please contact CG-1325, the e-Learning Program Office. More information can be found at:

- http://www.uscg.mil/hq/g-w/training/CG-1325.htm
- http://www.uscg.mil/tcyorktown/ptc/index.shtm
- http://cgweb.tcpet.uscg.mil/ist/

All courseware or e-tools shall follow the standards set forth in this Guide unless waived by the Government Program Manager.

Overview

Scope

The Guide directs styles, formats, and technical standards for asynchronous web-based training (WBT) and computer-based training (CBT) to be accessed from the USCG LMS. These do not involve an instructor or other type of human facilitator. A separate set of standards that apply to instructor-led or other type of human facilitation exist and should be consulted for that type of training. Standards in this Guide should not be construed to these other types of e-learning.

Technical Architecture

The technical system includes:

- Sharable Content Object Reference Model (SCORM) - conformant LMS hosted at learning.uscg.mil
- Commercial content distribution
- Collaborative course systems
- Coast Guard Digital Network (CGDN+) using the Microsoft XP operating system
- Human Resources System: PeopleSoft Direct Access

Compliance With This Document

Compliance with and certification of products to be hosted on the USCG LMS against this standard ensures that the best interests of USCG and its personnel guide any e-learning course development. In addition to the specific standards appearing further in this document, the following general standards shall apply:

Coordinating with the USCG e-Learning Program Office, the Performance Technology Center (PTC) at Training Center Yorktown (which maintains this Guide) and the Instructional Support Team (IST) at Training Center Petaluma certify e-learning assets developed in accordance with these standards as "Coast Guard e-Learning" products. These courses and tools with this certification shall have the "Certified Coast Guard e-Learning" brand on the home page or splash screen.

All courseware or e-tools shall follow the standards set forth in this Guide unless waived by the Government Program Manager.

In addition to any compiled code, all code and files must be delivered in a format that enables USCG to revise these with the existing USCG suite of tools or with commonly available programs. Code must be commented and indicate beginning and end of sections in such a way as to facilitate later revision by USCG.

Overview

CG-1325 shall approve courseware prior to its distribution (COMDINST 1554 series: 6.k.).

Those designing e-learning for USCG purposes are expected to demonstrate an ability to exercise the principles of performance-based instructional systems design in every aspect of course decisions. If during the review process the USCG manager determines that elements of the course do not demonstrate sound ISD principles in keeping with USCG Standard Operating Procedures (SOPs), the developer will be expected to revise the e-learning and submit it for further review until approved. At the discretion of the USCG manager, payment or approval for hosting on the USCG LMS may be withheld until the elements of the course are approved.

Sharable Content Object Reference Model (SCORM) Conformance

All web-based courses developed for the Coast Guard must conform to SCORM 1.2 or 2004.

SCORM requires sharable content objects (SCOs) to be able to establish and terminate communication with the LMS. All web-based courses must meet this requirement, as well as any additional requirements included in the SOW.

Specific data requirements are covered in the Data Management section of this document.

For more information on SCORM, see www.adlnet.org. SCORM 1.2 or 2004 information, including the Conformance Test Suite can be found at http://www.adlnet.gov/scorm/history/12/index.cfm.

ADA Section 508 Compliance

Unless a waiver is secured from the e-learning project manager, all e-learning products must comply with Section 508 accessibility requirements. For more information, see:

- http://www.access-board.gov/508.htm
- http://www.access-board.gov/sec508/guide/1194.22.htm
- http://www.section508.gov/
- http://www.section508.gov/IRSCourse/resources/index.html
- http://cgweb.comdt.uscg.mil/hsc_t-2/Media/web/alcoast.htm.

Design and Development Management

Media Management

Create libraries of media elements for each project using a consistent naming convention for media elements. Assume all courses will be hosted on a case-sensitive file server. All media elements and link files should work regardless of the server operating system.

Do not use spaces in file or folder names.

Strategy

All major parts of the course (lessons, assessments, job aids) will be identified and accessible as separate Reusable Learning Objects (RLOs). SCORM 1.2 and 2004 are the recognized RLO technology to be used unless another technology demonstrates reliable accessibility via the designated USCG LCMS for a course.

More details can be found in the Data Management section of this document under *SCORM Data Requirements*. For more information, see also:

- http://www.adlnet.net
- http://www.adlnet.gov/scorm/history/12/index.cfm
- http://www.adlnet.gov/scorm/index.cfm

Copyright

Copyright clearances must be obtained and documented prior to the use of any copyrighted/protected materials. Developers will strictly comply with applicable copyright laws and regulations (COMDTINST 1554 series).

Development Tools

Regardless of which tool is used to create a Coast Guard e-learning product, the resulting output must be SCORM-conformant, and the authoring software must be commercially and readily available. Proprietary authoring software is not allowed. The Coast Guard must receive all source files when the project is completed.

Whenever possible, course content should be separated from the delivery system to make revisions easier. Courses should be modularized to allow revisions of individual modules without affecting the entire course. Code must be organized, legible, and thoroughly commented to facilitate any future revisions.

Design and Development Management

The following development tools are used by the Coast Guard, and are recommended:

Tool	Purpose
Lectora Professional Publishing Suite by Trivantis Corporation	W/CBT authoring and development
Macromedia Flash 8 Professional with ActionScript 2.0	W/CBT authoring and development, and animation
Macromedia Dreamweaver 8	W/CBT authoring and development
Macromedia Fireworks 8	Graphics and animation
Adobe Photoshop CS2	Graphics
3D Studio Max	3D rendering and graphics

Technical Standards

Connectivity Expectations

Coast Guard courseware and e-tools must be optimized for web delivery assuming a 56Kbps connection between the learner and the content server.

Workstation Compliance

E-learning products for Coast Guard applications must operate on the Coast Guard Standard Workstation (CGSW) and its variants, without the need for significant software or hardware modification.
The following are prohibited with the CGSW:

- Software installations
- Browser plug-in installations
- Modifying operating system settings
- User-installed executables
- Active X controls

CG-1325 and Coast Guard Telecommunications and Information Systems Command (TISCOM) shall approve courseware (compatibility) prior to its distribution (COMDINST 1554 series: 6.k.).

Technical Standards

Browser

Products shall be designed and optimized for Microsoft Internet Explorer 6.0 and compatible with other browsers. All web pages must use valid HTML and must conform to one of the following specifications as published by the World Wide Web Consortium (W3C):

- XHTML 1.0: http://www.w3.org/TR/xhtml1/
- HTML 4.01: http://www.w3.org/TR/html4/

Any deviation from these standards must be approved by the Government e-learning manager assigned to the project.

The W3C Markup Validation Service is available for free at: http://validator.w3.org/

Other free validation tools are available at: http://www.w3.org/QA/Tools/

Plug-Ins

Plug-ins acceptable within the USCG computing environment for the Coast Guard Standard Image 5.1 are listed at the following website: http://cgweb.tiscom.uscg.mil/support/isd1a/stdimageeng/image5.1/coreapps.htm.

Please check this website prior to beginning the project to ensure the plug-ins conform to the list.

Technical Standards

Media and Bandwidth

The goal is to find a realistic balance between bandwidth conservation and engaging, media-rich e-learning products with acceptable performance.

All media files should be optimized for web delivery and compressed as much as possible without seriously degrading the quality. Always assume learners have a low bandwidth connection. Take all measures necessary to ensure that courseware loads quickly.

Launched from the Coast Guard's LMS, and given a 56.6 Kbps connection, average content screens should strive to take no longer than 8 seconds to completely load. Screens should load incrementally to provide information to the learner as soon as possible, and minimize learner frustration while waiting for the entire screen to load. Screens should be no more than 320Kb with all included files.

Video and other large media files should load after the content screen has finished loading. Download progress of these files should be reported to the learner.

Policy strictly prohibits the use of streaming media formats.

The Coast Guard Standard Image supports Adobe (formerly Macromedia) Flash but does not support Real Media or QuickTime.

Audio Formats

Recommended audio file formats include SWF and MP3, which will play within a browser window. WMA should be converted to MP3 to avoid the use of a separate media player. WAV is never used for e-learning due to large file sizes.

Graphics Formats

Use JPG, GIF, or SWF for static photo graphics. Use GIF or SWF for static line drawings. All images must be 72 dpi. Ensure that graphics are optimized for browser display. Strive to avoid using JPG compression higher than seven; to conserve bandwidth, compress files as much as possible without sacrificing necessary detail. For GIF, use the Adaptive Palette, 128 colors maximum; fewer colors is better because it reduces file size, or use the minimum number of colors that allows for acceptable graphic quality.

Technical Standards

Animation Formats

Macromedia Flash may be used to develop animations and interactive content. Adhere to best practices for vector animation development; do not animate bitmaps within Flash as this will cause excessive file sizes and slow performance.

Video Formats

Recommended video formats are MPG and FLV (Flash Video). MPEG (.MPG) files must be compatible with Windows SW3 and Macintosh computers running QuickTime. FLV format is recommended for compatibility. Ensure that video is properly compressed, and use the smallest appropriate video screen size to convey necessary information. Video should be integrated into the course and play in the course window without launching an external player.

Real Media and QuickTime are not supported on the Coast Guard Standard Workstation and may not be used in e-learning.
Policy strictly prohibits the use of streaming video.

Digital duplicates of the original video footage must be provided with the source files upon completion of the project.

Note: The intent is to receive copies that are equal to the original source in quality.

User Interface Standards

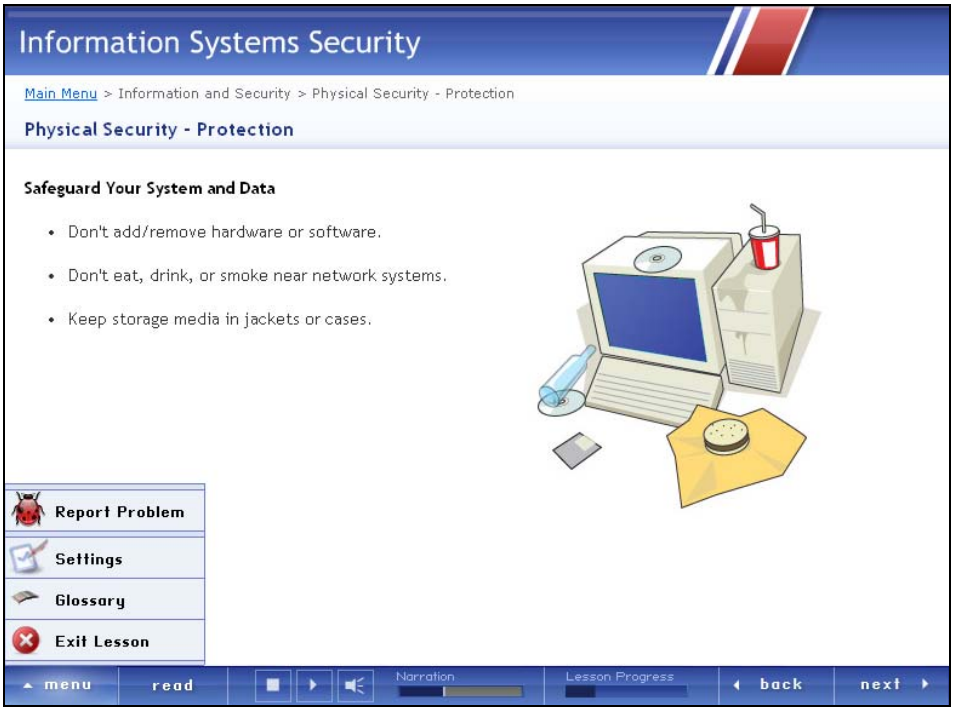
e-Learning Interface Template

All Coast Guard e-learning W/CBT products are required to use the most current version of the approved e-Learning Interface Template. Through your Program Manager, contact the e-Learning Program Office, PTC, or the IST for template source files for specific authoring tools.
The e-Learning Interface Template standardizes the following elements:

- Screen palette/colors
- Navigation icons and placement
- Menu configuration
- Interface graphic design.

User Interface Standards

Below is an example of the e-Learning Interface Template, as used in the Coast Guard Information Systems Security Brief:



Screen Specifications

The minimum screen resolution for CGSW learners is 1024 x 768 ppi. Therefore, optimum e-Learning Template size is 780 x 578 ppi.

Do not automatically resize the browser window to full screen; this allows for better windows management and avoids potential problems with CGSWs equipped with dual-monitor systems.

Title Bar Formatting

The title appears on the left of the top banner bar. Use 24-point Trebuchet MS. Within the e-Learning Interface Template, the title bar is a graphic image rather than HTML text; adhere to best practices to ensure appropriate quality for text as a graphic.

User Interface Standards

Body Section Formatting

Element	Standard
Fonts	Must be sans-serif. Use Verdana, Arial or Tahoma only. The exception would be a second font used to distinguish some text as an object (for example, code excerpts could be 10-point Courier, etc.).
Amount	Use six or fewer lines of text per screen.
Lists or sequences	List sequences as bulleted and numbered lists, or embed the information in tables.
Headers	Use 14-point bold.
Sub-headers	Use 12-point bold.
Text Menus	Use 8-point.
Body Text	Use 8- or 10-point. Never all bold.
Text Appearance	Do not indent paragraphs. Left justify body text and titles. Underline and color hyperlinks following standard visibility guidelines. Do not use blinking text. Reserve all-upper case for special titles, switch/component names, and terms and abbreviations used on equipment. Do not use vertical or horizontal scrolling. An exception may be scrolling for a narration text box.
Bullet Appearance	Use either plain round or square bullets. Be consistent. Flying or decorated bullets are not allowed.

User Interface Standards

Main Menu Specifications

The main menu provides access to all the top-level content modules in a course through a hyperlinked list of content module titles. Clicking a module title takes the learner to either the first content screen in the module, or a sub-menu when appropriate. The main menu should present the high-level organization of a course and provide the learner with a logical sequence for proceeding through the course. The number of entries should be limited so that the learner is not overwhelmed with too many entries from which to select. There should only be one main menu screen in a course. A course exit button should be available from the main menu.

Main menus usually have the following characteristics:

- All major sections are visible without scrolling.
- Consistent in appearance and operation.
- Use similar formats and color for similar screens.
- Limit menu layers to two, a main index and a segment index, to ensure the course structure is obvious.
- Main and segment menus are similar in design. Each should contain navigational information and selection options.
- Main menus should contain a list of options (sub-menus) from which the student may select.
- Sub-menus should allow the student to return to the main menu. A selection button/icon should be placed on each sub-menu.
- Navigation is possible by both keyboard and mouse.

Main menus should contain the following lesson information:

- Title (lesson name)
- Module Names (titles of segments to be reviewed)

User Interface Standards

Sub-Menu Specifications

Sub-menus should be used when top-level content modules contain nested content modules. These should allow the learner quick access to content modules. Sub-menus function like a main menu for the content module, and also provide a link back to the main menu and/or the parent content module. The number of sub-menus is depending on course content. Sub-menus should not contain a list of screens in a module, but should contain links to nested content modules.

Sub-menus typically have the following characteristics:

- Sub-menus do not usually provide an explanation of their elements since the title should be self-explanatory (such as "test").
- Sub-menus may contain some of the same items as the main menu (such as, title, exit, help, reverse and forward buttons).
- Sub-menus contain items that allow students to "fast forward" through the module.
- Sub-menus allow students to exit any time they choose.

Fonts must be sans-serif, 8 point Verdana. Icons should be logical and consistent. For descriptions and placement of sub-menu element icons, see the Buttons table under Navigation in the following section.

Course Map

A course map provides access to every module and content screen in a course. It allows users to view the structure of the entire course on one page. It is accessed from the main menu or from the submenu. Use the course map to navigate among various areas within each unit. The course map should be organized by content module, similarly to the main menu, but should include direct links to all screens unless otherwise directed by the government program manager. It should provide the learner quick and easy access to any point in the course.

User Interface Standards

Naming conventions used in the course map for screens beneath the lesson level should be identified in a way that quickly allows the learner to locate the desired screen. Course maps should be included in a course, unless otherwise specified in the statement of work.

The specific execution of the map may have to be tested to ensure it operates as intended and does not create conflicts in the LMS. Please provide the USCG e-learning manager for your course the plan for the map and receive approval before programming.

Button and Menu Functionality

Ensure that the buttons/icons and menu items do not work at cross-purposes. For example, if a "Back" button is disabled, then the menu function that does the same job should also be disabled.

Navigation

Navigation Principles

Screens shall clearly indicate the learner's next move, indicating to click on a link or that the page content has been completed. The option must be given to learners to proceed through the screens at his or her own pace unless there is sufficient and documented advice emanating from the instructional design that the pace must be controlled for all learners.

The navigation graphics included in the e-Learning Interface Template change in appearance depending on the function of the screen. For example, inactive navigation buttons (such as "Next" button disabled during a narration) have a color or shading change to indicate their status.

The learner must make no more than three clicks to get to the desired screen.

Navigation

When a course is closed using the red X button in the top right of the browser window, scripts must be in place that capture the learner's progress in the course and any other relevant tracking data, and send this information to the LMS.

It is strongly advised to launch tests in a separate "chromeless" browser window. Removal of the browser title bar and the red X button will help ensure that the learner does not prematurely or accidentally close the window, possibly losing test data before it can be recorded to the LMS.

Location Indicator

At all times, the learner's location within the course should be clear and obvious to the learner.

The location indicator must operate consistently across the course and provide the learner with an accurate record of the learner's progress through the course.

Breadcrumbs help learners know where they are in the course or pick up where they left off by showing how the current location relates to 1) earlier screens and/or 2) next options.

Use breadcrumbs in the upper left of the content screen. Hyperlinked breadcrumbs are optional. See the screenshot of the e-Learning Interface Template for an example of breadcrumbs.

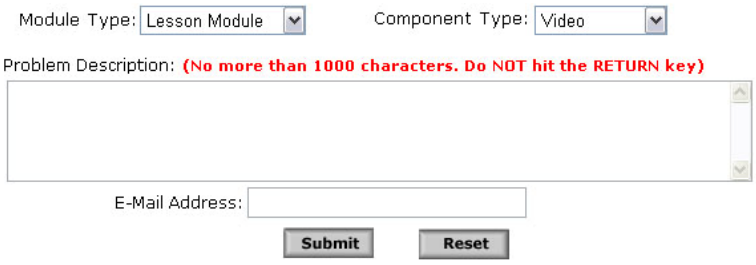
Buttons And Navigation Menus

Screens contain both buttons and navigation menus. A navigation menu is available from the button on the screen labeled "menu." All buttons and the navigation menu must be easy for the learner to use and must function predictably. These should never be confused with standard browser buttons in name, icon, or function.

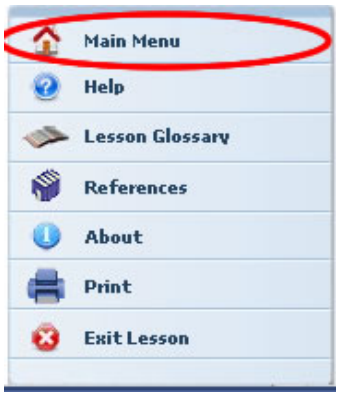
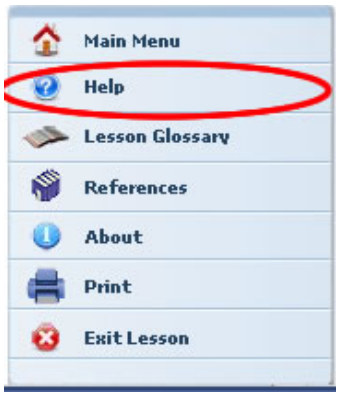
The table below lists the navigation buttons in the e-Learning Interface Template. Some are mandatory (M); others are optional (O). Specifications for optional buttons are given below in the table.

The table is divided into two sections. The first section describes buttons found in the bottom navigation bar of the template. The second section describes buttons found in the pop-up navigation menu.

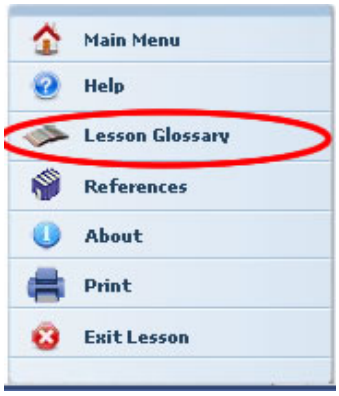
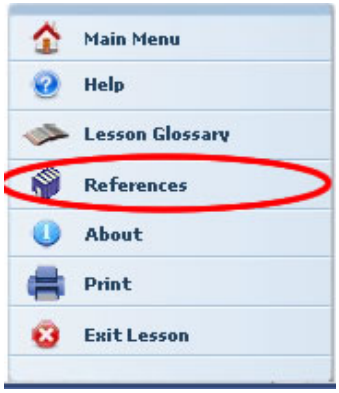
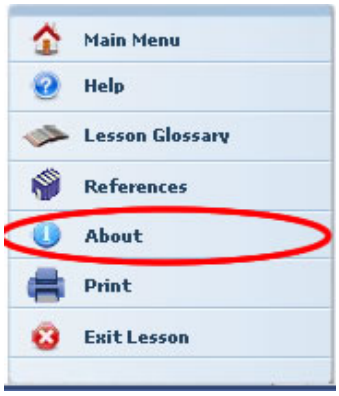
Navigation

Bottom Bar Requirements			
Button	**Function**	**Location**	**Example**
Menu (M)	Enables access to the pop-up Navigation Menu. The Navigation Menu contains several mandatory buttons and some optional buttons.	Bottom bar, left side.	
Next & Back (M)	Enables linear navigation. May be disabled to make the learner take some desired action. For cases in which the instructional design requires that the learner not have access to previous screens, omission of the Back button is acceptable.	Bottom bar, right side.	
Read (M but Optional if there is no audio	When toggled, displays text of the audio.	Bottom bar.	
Return	Goes back to the last screen accessed.	Bottom bar.	
Feedback	Accesses the form to provide feedback on lesson components.	Bottom bar.	
Feedback form	Provide feedback on any lesson component.	Accessed via the Feedback button.	
Feedback form: 			

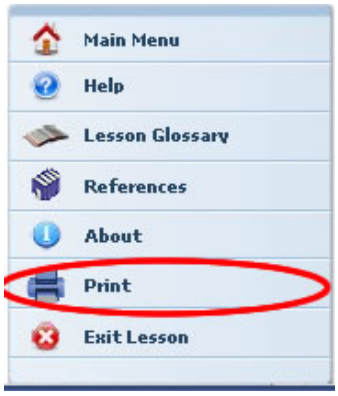
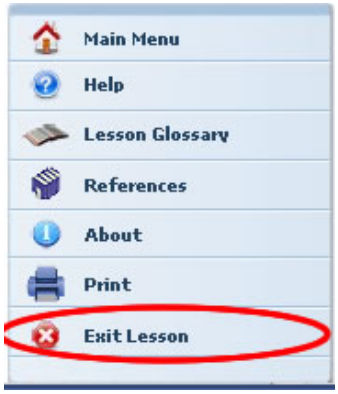
Navigation

Bottom Bar Requirements			
Button	**Function**	**Location**	**Example**
Audio Controls (M but Optional if there is no audio)	Use audio controls when there is audio with a screen. Learner must be able to pause and play audio. Learner must have the option to turn sound on/off, either via a pop-up volume slider or mute button. A narration progress bar is optional.	Bottom bar.	
Navigation Menu Requirements			
Button	**Function**	**Location**	**Example**
Main Menu (M)	Returns learner to the main menu of the course.	Navigation Menu	
Help (O)	Provides information regarding possible technical difficulties, interface features/orientation, and support contacts.	Navigation Menu	

Navigation

Navigation Menu Requirements			
Button	**Function**	**Location**	**Example**
Glossary (O)	Provides definitions of commonly used terms.	Navigation Menu	
References	Accesses references useful to anyone going through this lesson.	Navigation Menu.	
About (O)	Contains a description of the course (developer, date).	Navigation Menu	

Navigation

Navigation Menu Requirements			
Button	**Function**	**Location**	**Example**
Print (O)	Prints current screen.	Navigation Menu	
Exit (M)	Records learner progress and course location in the LMS, and exits the course. The exit process must clearly inform the learner that she or he is exiting in the proper manner so that no work will be lost.	Navigation Menu	
Report problem (O)	Sends bug report to technical support.	Navigation Menu	

Optional Navigation Buttons

If the instructional design warrants the use of optional navigation buttons, these shall be inserted and meet the following standards:

- Buttons are clearly labeled, or a reference providing the purposes of these buttons exists.
- Button use/purpose must be immediately clear to the learner.

Navigation

- Buttons are easily accessible within the courseware and clearly distinguishable from the regular navigation buttons used throughout the course.
- Buttons function predictably.
- Buttons provide access to additional information without substantial use of support systems.
- Buttons provide location-marking capabilities without substantial use of support systems.

Teaching Content and Communication Strategies

Principles and Strategies

All design and development decisions must conform to the approved and current versions of USCG Training SOPs. Any training developed for USCG is intended to improve human performance. Those designing e-learning for USCG purposes are expected to demonstrate an ability to exercise the principles of performance-based instructional systems design in every aspect of course decisions. If during the review process the USCG manager determines that elements of the course do not demonstrate sound ISD principles in keeping with USCG SOPs, the developer will be expected to revise the e-learning and submit it for further review until approved.

For further guidance, refer to the various USCG SOPs at the following website:
http://www.uscg.mil/tcyorktown/PTC/SOP/

Links to specific Training SOPs

- Introduction: http://www.uscg.mil/tcyorktown/ptc/SOP/SOP%20Intro.pdf
- Analysis: http://www.uscg.mil/tcyorktown/ptc/SOP/QAnalysisfinalsop.pdf
- Evaluation: http://www.uscg.mil/tcyorktown/ptc/SOP/Evaluation%20SOP.pdf

Teaching Content and Communication Strategies

- Job aids: http://www.uscg.mil/tcyorktown/ptc/SOP/JA.final.sop.pdf
- Resident Instruction: http://www.uscg.mil/tcyorktown/ptc/SOP/RIsop.pdf
- Curriculum Outline: http://www.uscg.mil/tcyorktown/ptc/SOP/CurriculumOutlineSOP.pdf
- E-learning: http://www.uscg.mil/tcyorktown/ptc/SOP/E-Learning%20SOP.pdf
- Non-instructional Interventions: ftp://cgweb.tcyorktown.uscg.mil/PTC/SOP/Non-Instructional%20Interventions.pdf
- PQG: http://www.uscg.mil/tcyorktown/ptc/SOP/PQG%20SOP.pdf
- Professional Development: http://www.uscg.mil/tcyorktown/ptc/SOP/Q-PD%20SOP%20FINAL.pdf

Language

Draft all text to be read at the 7th grade reading level using the Fog Index Reading Level indicator. Use the Flesch-Kincaid Reading Level Score that is part of Microsoft Word to determine reading level of a document.

The amount of text on the screen must enable the learner to quickly and effectively learn from the screen. Avoid excessive text.

Spelling, grammar, and punctuation must not distract from the learning. Use active voice, concrete nouns, and positive statements.

Define new terms the first time they are used, and create a glossary if there are several new terms. Avoid pronouns, acronyms, abbreviations, and jargon. Acronym definitions should go in the glossary as well.

Media Usage

Graphics, audio, and video used in USCG e-learning must demonstrate value-added in reaching performance objectives and in supporting USCG work tasks. Use of these assets for entertainment or as seductive augmentation is discouraged.

Teaching Content and Communication Strategies

Graphics

The graphics used should demonstrate direct relevance to the screen content and performance objectives, be large enough and detailed enough to see pertinent information, support other screen elements, and not be cluttered with unnecessary detail.

Audio and Video

Audio and video should only be used to augment e-Learning products when deemed instructionally appropriate. There shall be no attempt to use audio or video to lock-step the learner unless specifically signed off by the client. Audio must have a control to turn it off.

Assessment

Principles and Strategies

Assessment enables the Coast Guard and the learner to know if learning occurred.

Assessments shall be performance-based: use real-life scenarios, performance stimuli and conditions that approximate the real work world whenever possible. Text should only be used when it directly emulates the work task or when it has been judged to be the best strategy to identify acquisition of a task in the online training environment.

Follow the advice in the *USCG SOP For Training Volume 3 Evaluation* in constructing assessments. This SOP is located at:

http://www.uscg.mil/tcyorktown/PTC/Evaluation%20SOP.pdf

Checks on Learning

Quizzes ensure learners comprehend the training content. There shall be at least one practice question for each enabling objective.

Learner should receive immediate constructive feedback; the correct answer should be given on the second attempt; the learner should never be caught in a loop.

For incorrect answers, feedback must ultimately identify the correct or most appropriate response. In cases where an incorrect response would result in a high risk consequence, the feedback associated with that responses must provide the learner knowledge of that consequence and point the learner to the correct answer.

Assessment

Module Assessment

At appropriate points in the course, enabling objectives shall be assessed. These assessments must match the nature of the performance required by the objective. If a learner is supposed to perform a particular skill, then the skill must be elicited and evaluated.

Require performance within a realistic context whenever possible.

Follow the advice in the *USCG SOP For Training Volume 3 Evaluation* in constructing assessments, tracking work performance, and for item construction.

Tests of Learning

Pre-tests allow learners to "test out" of parts or all of a course. When not in conflict with policy or mandated training requirements, pre-tests are recommended. Pre-tests are optional unless specified as required in the Statement of Work.

Pre-tests must demonstrate test strategies and weighting for tasks that are medium to high risk or complex.
Learners must demonstrate required competency to pass as defined in the Statement of Work.

Performance tests for TPOs should simulate the standards expressed in the conditions of the TPO, using the highest level of simulation possible. A job aid for developing performance-based assessments is included as Appendix D of the Evaluation SOP. They should be used to redirect a student's learning; as a progress-check on their learning. Generate assessments in XML format.

A counter shall be embedded into all test elements of any course that has testing. The counter shall report to the LMS each time a learner takes the test. On each occasion the score for the test shall be reported to the LMS.

If SCORM 1.2 or 2004 is applied, the performance analyst assigned to the project shall direct whether each test item is to be treated as a SCO. Refer to the Data Management section on SCORM in this document for more information.

Data Management

Data Collection

If the course does not require any data tracking, this section does not apply. The Statement of Work or Course Requirements document shall provide the vendor with the list of data to be collected from each part of the course.

The vendor shall insert the correct calls to the LMS. The vendor shall demonstrate that the data have been reliably captured and that the data calls operate as intended and produce the expected, reasonable results in the LMS.

To help ensure data calls function properly, all web-based courses must pass three out of four tests in the "SCORM Version 1.2 Conformance Test Suite Version 1.2.6 (Self Test)." The fourth test is a runtime test and must be completed by the LMS administrator. To pass this test, the course must load, run, and report back to the LMS.

SCORM Version 1.2 Conformance Test Suite Version 1.2.6 (Self Test) can be downloaded from http://www.adlnet.org/

SCORM Data Requirements

The course requirements document will specify the data to be collected from each part of the course. At a minimum this will include the following data fields for every SCO:

Data Field	Purpose
cmi.core.lesson_location	Must be set when a learner exits the SCO. On subsequent SCO restarts, this data field must be retrieved and evaluated, giving the learner the option of returning to the last screen visited or the main menu.

Data Management

cmi.suspend_data	Should be used to store student progress in an SCO, if applicable. For example, cmi.suspend_data a course should indicate which modules or lessons a student has completed. This data can be stored in cmi.suspend_data. The data field can be used to store additional SCO-related data that may be needed when an SCO is restarted.
cmi.core.lesson_status	Must be set when a learner exits an SCO. See the SCORM specification for values to be used in this data field. The value of this field should be determined according to the course requirements.
cmi.core.score	For all scored SCOs, learner scores will be stored in this data field. The minimum passing score must be stored in cmi.core.score.min. If the minimum score has been met, cmi.core.lesson_status must be set to "passed."

Additional data fields may be required. Use of non-mandatory SCORM data fields in a course must be approved by the Government Program Manager. If a non-mandatory data field is implemented in a course, the course must provided a mechanism to handle an LMS Error Code 401 – Not Implemented error.

Data Management

DHS Recommendations for Instructional SCOs

Instructional SCOs should be programmed to carry out the following tasks:

- Present information to the student in an instructionally sound manner, using logical progression of information presentation that adheres to an instructional method.
- Report whether the student has completed the SCO when they exit.
- If a student has not completed the SCO upon exiting, the SCO should report bookmarking data to the LMS.
- When the student re-enters the SCO, the SCO should query the LMS for the bookmarking data.
- Upon receipt of the bookmarking data from the LMS, the SCO should implement bookmarking functionality.

Recommendations for Assessment SCOs

Assessment SCOs should be programmed to carry out the following tasks:

- Report completion data and the percentage of questions answered correctly to the LMS.
- Store the completion data in a data element.

QUALITY Control Testing and Inspections

General

Developer refers to either an internal developer or to an external contractor that has been retained to develop the e-Learning. The e-Learning developer shall maintain an inspection system which shall insure that each item offered for acceptance or approval conforms to the contract requirements and this style guide. The inspection system shall be documented and available for review by the Coast Guard.

Records

The developer shall maintain records of all inspections and tests. The records at a minimum shall indicate the nature and number of observations made, the number and type of deficiencies found, and the corrective action taken.

Responsibility for Inspection

The developer shall be responsible for the performance of all inspection requirements specified herein. The developer shall provide space, personnel, software and test equipment for the conduct of all inspection requirements. If you are an internal developer, contact the e-Learning Systems Administrator to access the testing software.

QUALITY Control Testing and Inspections

The Coast Guard reserves the rights to verify or have performed any of the inspections that are deemed necessary to assure that the product conforms to the prescribed requirements.
Each e-Learning product delivered shall be inspected and tested as follows:

Visual Inspection

Ensure the product meets the applicable requirements detailed under the Design & Development, Technical Standards, User Interface Standards, Navigation, Teaching Content & Communication Strategies, Assessment, and Data Management sections of this guide.

Functional Test

Test the product to assure all elements and components function as intended.

Section 508 and Accessibility Test

Unless a waiver is granted, the product shall be tested to verify that it is in full compliance with Section 508 of the Rehabilitation Act. Additionally it shall be tested using a Jaws Screen Reader to assure Accessibility is achieved. The developer must provide a written statement indicating that the product complies with ADA Section 508.

SCORM Test

All SCORM inspection and testing shall be performed at the developer's plant or at other facilities acceptable to the Coast Guard. ADL Co-Lab certification centers, such as the Wisconsin Testing Organization or Naval Undersea Warfare Center (NUWC) Division Keyport, are testing location options. More information on certification centers can be found at http://www.adlnet.gov/scorm/certified/index.cfm
Acceptability of other facilities will be conveyed in writing by the USCG LMS Administrator.

QUALITY Control Testing and Inspections

To help ensure data calls function properly the courses must pass the following test from SCORM Conformance Test Suite (CTS):

- Content Package Conformance Test
- Sharable Content Object (SCO) Run Time Environment (RTE) Conformance Utility Test
- Manifest Utility Test

Test should be done using the version of the CTS that matches the SCORM version specified in the planning documents. The CTS can be downloaded at no cost from http://www.adlnet.gov/scorm/index.cfm. The developer must provide results of the tests including detailed logs for each test. The actual files that were tested must be delivered to the USCG Project Manager in a Package Interchange Format (PIF) or in a non-PIF folder containing all the files required to launch the product from the LMS. PIF files in .zip format are preferred.

LMS Test

The developer must obtain from the USCG LMS Administrator the current LMS version information. This must be used for all testing. The developer must conduct all necessary pre-tests to assure compatibility prior to submitting the files for posting on the LMS.
The USCG e-Learning Systems Administrator conducts the test. Testing includes loading the product into the LMS, launching the courseware as a learner, and verifying communication between the product and the LMS.
The USCG e-Learning Systems Administrator reports the results of the test in writing to the developer with a copy to the USCG Project Manager. The report identifies each issue where the product failed to function as intended. Where possible, the change required should be identified. Where specific script changes required are not common knowledge, the specific script shall be provided to the developer so that the script can be correctly incorporated.

The developer makes changes and resubmits the product through the above process.
When the product functions as intended, the USCG e-Learning Systems Administrator documents the recommendation for product approval on the Product Approval Form, which is part of the e-Learning SOP.

QUALITY Control Testing and Inspections

Pilot Test

After the product has been successfully loaded and functionality verified on the LMS, a Pilot Test shall be conducted according to the approved specifications provided in the planning documents. A record of any discrepancies found will be provided to the developer to make the necessary changes.

Acceptance Testing

After all deficiencies have been corrected, the final product will be delivered to the USCG LMS Administrator for posting, verification, final testing and acceptance. Once determined acceptable, all source files will be delivered to the Government.

References and Links

Contacts:

- http://www.uscg.mil/hq/g-w/training/CG-1325.htm
- http://www.uscg.mil/tcyorktown/ptc/index.shtm
- http://cgweb.tcpet.uscg.mil/ist/

Section 508:

- http://www.access-board.gov/508.htm
- http://www.access-board.gov/sec508/guide/1194.22.htm
- http://www.section508.gov/
- http://www.section508.gov/IRSCourse/resources/index.html
- http://cgweb.comdt.uscg.mil/hsc_t-2/Media/web/alcoast.htm

SCORM:

- http://www.adlnet.net
- http://www.adlnet.gov/scorm/history/12/index.cfm
- http://www.adlnet.gov/scorm/index.cfm

HTML Specifications:

- XHTML 1.0: http://www.w3.org/TR/xhtml1/
- HTML 4.01: http://www.w3.org/TR/html4/

Markup Validation:

- http://validator.w3.org/
- http://www.w3.org/QA/Tools/

USCG Standard Operating Procedures Manuals:

- http://www.uscg.mil/tcyorktown/PTC/SOP/

Glossary

Term	Definition
ADL	Advanced Distributed Learning (ADL): An initiative by the U.S. Department of Defense to achieve interoperability across computer and Internet-based learning courseware through the development of a common technical framework, which contains content in the form of reusable learning objects.
Asset	1) Intellectual property. Also known as knowledge asset. 2) Hardware and software owned by an organization.
Asynchronous Courseware	Learners progress individually through the course at different times/paces than the other learners in the same course.
Client	The person representing the Coast Guard office or command that is being assisted by an e-learning project. Often, the client funds a project and has final approval authority.
Conformant (Standards-Conformant)	E-learning that meets all the requirements of a published specification but that has not gone through the formal application process to be deemed compliant.
Courseware	Any type of instructional or educational course delivered via a software program or over the Internet.
e-Learning	Term covering a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, CD-ROM, and more. In the Coast Guard, we say e-learning is: "Growing, using, and moving knowledge by electronic means where we need it and when our people want it."

Glossary

Term	Definition
Electronic Tool (E-Tool)	Synonymous with Electronic Performance Support System in this Guide. 1) A computer application that's linked directly to another application to train or guide workers through completing a task in the target application. 2) More generally, a computer or other device that gives workers information or resources to help them accomplish a task or achieve performance requirements.
Flesch-Kincaid Reading Level (Fog Index)	Use the Flesch-Kincaid Reading Level Score that is part of Microsoft Word to determine reading level of a document. To activate the Flesch-Kincaid Reading Level feature, use Tools>Options. The bottom selection of the View tab enables the reading level score. The next time the document is spell-checked, the reading level score will be displayed at the end of the spell-check.
FLV	Flash video file that can be used to deliver video to a web browser using the Flash player. Requires Flash Player 6.0 or higher. FLV files can be embedded or linked to a Flash file.
GIF	Stands for Graphics Interchange Format, a file format developed specifically for the web.
Government Program Manager	This is the contracting official who is the point of contact with commercial vendors or serves as the project manager for Coast Guard internal development. Either the USCG e-Learning Program Office, PTC at TRACEN Yorktown, or the IST at TRACEN Petaluma may interpret any of the standards in this Guide. Government Program Managers must coordinate all interpretations with PTC or the IST.
Hypertext Transfer Protocol (HTTP)	"Hypertext Transfer Protocol" specifies the way that information/web pages are accessed through the Internet/Intranet.
Hypertext Markup Language (HTML)	Code used to create web pages.

Glossary

Term	Definition
Instructional Design	A systems approach to course or e-tool development that ensures specific performance goals are accomplished. It is an iterative process that requires ongoing evaluation and feedback. The design is the blueprint for an e-tool or course and precedes development.
MP3 Files	A format for sound file compression that enables users to download music over the Internet.
MPG Files (Moving Picture Experts Group)	1) A high-quality video file format that uses compression to keep file sizes relatively small. 2) The subgroup of the International Organization for Standardization responsible for setting the standards for this format.
SCO (Sharable Content Object)	A collection of assets that becomes an independent, defined piece of instructional material.
SCORM (Sharable Content Object Reference Model)	A set of specifications that, when applied to course content, produces small, reusable learning objects. A result of the Department of Defense's Advance Distributed Learning (ADL) initiative, SCORM-compliant courseware elements can be easily merged with other conformant elements to produce a highly modular repository of training materials.
SOP (Standard Operating Procedure)	Provides step–by-step guidance for designing, developing, evaluating, delivering, and sustaining great e-courses and e-tools that objectively include performance and adhere to the technical and usability requirements that allow for maximum benefit from the products. This document is both a standards document and SOP for e-learning.
Static Medium	This is a presentation element that does not have movement, sound, or video. Examples are drawings and photographs.

Glossary

Term	Definition
SWF Files	This is the designation for a Flash file. Flash is a Macromedia product and is used in animation. This is the preferred method for animation and multimedia in asynchronous courses or tools. While essentially a visual and interactive medium, SWF files can be used for audio.
WAV Files	This is a common audio format. It is not a recommended format, because WAV files are take too much memory and are unwieldy in web applications.
Web-Based Training (WBT)	Delivery of educational content via a web browser over the public Internet, a private intranet, or an extranet. Web-based training often provides links to other learning resources such as references, email, bulletin boards, and discussion groups. WBT may also include a facilitator who can provide course guidelines, manage discussion boards, deliver lectures, and so forth. When used with a facilitator, WBT offers some advantages of instructor-led training while also retaining the advantages of computer-based training.
WMA Files	The preferred audio format. This format always carries a stereo signal, but carries clear audio while creating a modest draw on bandwidth resources.
XHTML (Extensible Hypertext Markup Language)	A reformulation of HTML 4.01 in XML, combining the strength of HTML 4 with the power of XML. XHTML uses the XML specification to define a set of elements for use in web pages. More information can be found at http://www.w3.org/MarkUp/#recommendations.

Glossary

Term	Definition
XML	Extensible Markup Language (XML) is a simple, very flexible text format for storing data and is derived from SGML (ISO 8879). Originally designed to meet the challenges of large-scale electronic publishing, XML also plays an important role in the exchange of a wide variety of data on the web and elsewhere. XML documents are made up of storage units called entities, which are also commonly called elements. XML does not have a pre-defined set of elements, but allows the author to determine the element names and data structures. For more information, see http://www.w3.org/TR/2006/REC-xml-20060816/.

Appendix B – Alignment Control Documents

First ADL Alignment Meeting

Project Title:

Meeting Date:

Course Data Sheet:

Client Organization	
Organization	
Client goals for this project	
Description of project	

Roles	**Name**	**Title**	**Organization**	**Telephone**	**Email**	**Attended Meeting**
Client						☐ yes ☐ no
Client Point of Contact						☐ yes ☐ no
CG-1322 Program Manager						☐ yes ☐ no
CG-1321 HPT of Record						☐ yes ☐ no
Technical Accuracy Authority						☐ yes ☐ no
CG-1325 Representative						☐ yes ☐ no
ADL Project Officer						☐ yes ☐ no
Other						☐ yes

Roles	Name	Title	Organization	Telephone	Email	Attended Meeting
(state role)						☐ no
Other (state role)						☐ yes ☐ no
Other (state role)						☐ yes ☐ no

Parameters/Requirements	
Regulatory or policy constraints relevant to the project	
Other requirements, constraints, expressed by client:	

Funding	
Entity responsible for funding	

Reference Documents	
FEA and HPT analysis	Approved by CG-1321 yes ☐ no ☐ Location of analysis files:
Curriculum outline	Approved by CG-1322 yes ☐ no ☐ Location of outline file:
Other supporting documents	Name Location Name Location Name Location Name Location

Second ADL Alignment Meeting

Project Title:

Meeting Date:

In Attendance:

Roles	Name	Title	Organization	Telephone	Email
Client					
Client Point of Contact					
CG-1322 Program Manager					
CG-1321 HPT of record					
Technical Accuracy Authority					
CG-1325 representative					
ADL Project Officer					
Other (state role)					
Other (state role)					
Other (state role)					
Other (state role)					

Alternative	Rough Order of Magnitude (ROM)	Reasons for Rejection

Summary of Examination

Recommendation:

	GOTS/COTS ☐ New development ☐
Agreed upon deliverable minutes of learning(for example, GOTS/COTS as is, GOTS/COTS refined for USCG use, new informational ADL development, new interactive ADL development)	
Scope	
Expected life of course in years	
ROM for development	
ROM for first year maintenance	
ROM biennially after 1 year	
Notes regarding how the work will proceed or other stipulations on interim or final deliverables.	

Review Responsibilities

Testing requirements (pre-test, post-test, proctored, etc):

	Description of additional requirements
Pre-test required? ☐ yes ☐ no	Testing will be based on TPOs and EOs. Please list any other specific requirements:
Post-test required? ☐ yes ☐ no	Testing will be based on TPOs and EOs. Please list any other specific requirements:
Proctoring required? ☐ yes ☐ no	Describe criteria for acceptable proctor and environment in which the test is taken.
Other testing requirements	

Reporting Requirements:

	Details
Raw data required (list)	
Aggregated data required (list)	
Transformed data required (means, standard deviations, etc.)	
Reporting format (describe)	
Reporting interval (e.g., weekly, monthly)	

Deliverables requiring Client approval before proceeding to the next step:

	Due date
1. Memorandum of understanding (this document)	
2. Course Design Document, Project Plan, Piloting Plan	
3. Changes in cost greater than 10% of original estimate	
4. Finalized code on production server	

I agree to the terms, costs, and dates included in this document and authorize the development as described here. The person I have designated as "Approver" will be available on the due dates specified for delivery and will provide the approval on behalf of myself and representing input from the SMEs and other reviewers. If project dates change, both the approver and I will be notified of proposed new dates and will work with the ADL project officer to identify new dates and to provide approval by the new date.

Signatories

Name	office	Signature	Date
For Client:			
For CG-1325	CG-1325		
ADL Project Officer			

Appendix C Course Design Document (CDD) required sections

1. Learner population
   - 1.1. Desired performance associated with the training
   - 1.2. Size of the population
   - 1.3. Description of normal learner population and situation
     - 1.3.1. Billets
     - 1.3.2. Locations
     - 1.3.3. Environment in which the ADL will be experienced
       - 1.3.3.1. Technical access
       - 1.3.3.2. Suitability for study
     - 1.3.4. Current knowledge, skills, attitudes
     - 1.3.5. Education level
       - 1.3.5.1. Math
       - 1.3.5.2. English
       - 1.3.5.3. Other relevant content education
     - 1.3.6. Prior work experience
     - 1.3.7. Experience using this learning technology
   - 1.4. Other populations that are potential users of this course
2. Objectives for the course
   - 2.1. Terminal
   - 2.2. Enabling
3. Instructional approach to be used for the course
   - 3.1. Overall approach
   - 3.2. Course length
   - 3.3. Module names and sequence
   - 3.4. Practice strategy
   - 3.5. Feedback strategies
   - 3.6. Tracking strategy
   - 3.7. Testing strategy
   - 3.8. Plan to ensure data is transmitted to LMS so that desired reports are generated
4. Confirmation of cost associated with the strategy [1]
5. Completed matrix for each module

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.			
3.			

[1] If cost exceeds 10% of original approved estimate, the increase must be approved by the client and CG-1325 prior to initiation of further work on the course.

6. Project plan
    6.1. Milestones with tasks and dates
    6.2. Review dates (must comply with review and approval requirements in this SOP)
7. Piloting Plan
8. Sources used to prepare this document
9. Signature blocks for ADLPO, Client

Appendix D e-Learning Storyboard Requirements

e-Learning Storyboard Requirements

Purpose: The storyboards have several purposes, one of which is to provide stakeholders with clear descriptions of the experiences on each screen. This will enable stakeholders to agree to the presentation of content and to the interaction. Storyboards can be either hard or soft copy. Regardless of form, for each module or lesson, the following storyboard elements must be clearly communicated for each screen so that stakeholders can review and approve these for programming:

1. Each screen must have a unique identifier.
2. The text to be used must be present and placed on the screen in roughly the same area where it would be placed after programming.
3. Visuals must be described or drafted so that key elements of the visual are obvious to the reviewer. Placement of the visuals must be roughly in the same area where these would be placed after programming.
4. Visual changes in the screen must be clearly communicated. These would include changes as animation, addition/ fade-out of visuals, zooms, etc.
5. If calculations or processing of learner inputs takes place on/behind the screen, it must be clearly communicated. This may include score calculations or processing of other data input by learners.
6. Videos must be available or clearly described.
7. Audio must be clearly described when it differs from the screen text.
8. If used, pop-up windows must be described along with the action taken which invokes each pop-up.
9. Branching must be clearly described and the resulting learner action made clear.

NOTE: See the ADL Asynchronous Learning Standards and Styles Guide (Appendix A) for further information.

Appendix E Glossary

Term	Definition
ADLPO	Advanced Distributed Learning Program Officer. May also serve as the COTR if approved.
Client	The USCG unit sponsoring the development or acquisition of the learning. One person represents that unit on funding and other training decisions.
COTR	Contracting Officer's Technical Representative (COTR) (FTS assisted services only): The COTR serves as the focal point for all task order activities. The COTR coordinates client agency activities, performs liaison activities, and serves as the primary point of contact with the contractors. The COTR may not make commitments/changes to the price, terms, or delivery provisions nor provide supervisory or instructional assistance to contractor personnel. The COTR provides technical advice and assistance to clients in identifying and defining requirements, tracks contractor performance including the timeliness and quality of deliverables, and performs acceptance of all supplies and service.
COTS	Commercial Off-The-Shelf
Curriculum outline	The USCG Curriculum Outline documents performance objectives for a course of instruction, documents training resource requirements for conducting resident and nonresident courses, identifies improvements or changes in training, maintains agreement between job performance requirements and validated training needs, facilitates the curriculum review and approval process, and serves as an audit trail document.
GOTS	Government Off-The-Shelf
High fidelity simulation	A simulation which closely matches the characteristics of a real environment.
HPT	Human performance technology

Human performance technology (HPT)	HPT uses a wide range of interventions that are drawn from many other disciplines including, behavioral psychology, instructional systems design, organizational development, and human resources management. As such, it stresses a rigorous analysis of present and desired levels of performance, identifies the causes for the performance gap, offers a wide range of interventions with which to improve performance, guides the change management process, and evaluates the results.
Lifecycle	This term refers to the process used to build and support the deliverables produced by the project. (Since a project has a start date and end date, the long-term support of a solution is usually performed after the project is completed.) For software development, the entire life cycle might consist of planning, analysis, design, construct/test, implementation and support.
Metric	A measured value
Pilot test	A pretest or trial run of a program, evaluation instrument, or sampling procedure for the purpose of correcting any problems before it is implemented or used on a larger scale.
Quality assurance agent	The USCG designate responsible for checking the accuracy, reliability, and functionality of ADL products.
ROM	Rough Order of Magnitude. The initial scoping of a project for level of effort and cost.
Systems Administrator	Coast Guard person responsible for LMS operation to include the loading and testing of courseware products.
TM	Training Manager assigned to the project from CG-1322.
Transformed metrics	Data that has been changed so that it can more easily be used. Examples for training include means, standard deviations.
VV&A	Verification, validation, and accreditation. This process is applied to ADL materials to authenticate debugging of code, functionality, and approval for USCG use.