

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

Volume 7

E-Learning



Coast Guard Performance Technology Center  
Office of Workforce Performance, Training and Development

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## SECTION I: Introduction

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### Introduction

This SOP describes the overall process by which Coast Guard e-Learning is requested, designed, developed and fielded. It also lists the procedures common to all Coast Guard e-Learning design and development efforts. Appendix G, United States Coast Guard E-Learning Standards and Styles Guide, lists the general standards (specifications) and styles used when designing and developing all Coast Guard e-Learning products and tools. It also lists the individual standards to use when developing tools such as Electronic Performance Support Systems. Variations from this process and procedures must be approved by G-WTT-5.

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### Purpose

The purpose of this SOP is to identify, establish and promulgate a clear and standardized process and set of procedures for designing and developing Coast Guard e-Learning products. In conjunction with Appendix G, E-Learning Standards and Styles Guide, it will:

- define what Coast Guard e-Learning means.
  - explain how to initiate a request for developing Coast Guard e-Learning
  - emphasize the importance of focusing on human-centric instructional design
  - provide a standard methodology for designing and developing Coast Guard e-Learning products.
  - enable consistent outputs from any organization designing and developing such products.
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### Target Audience

This SOP is for Coast Guard e-Learning designers and developers and contractors designing and developing such products.

Headquarters Program Managers, Rating Force and Rating Training Master Chiefs, Coast Guard Training Officers and School Chiefs shall use this SOP to guide all Coast Guard e-Learning efforts.

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### What Does e-Learning Mean for the Coast Guard?

This SOP is the culmination of several years' work by the Coast Guard Training System and the Performance Technology Center to create a system that ensures Coast Guard e-Learning products follow a Human Performance Technology analysis and are, in fact, being created to support work accomplishments the Coast Guard values.

The Coast Guard defines e-Learning as:

**“Growing, using and moving knowledge using electronic means where we need it and when our people want it.”**

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## SECTION I: INTRODUCTION (continued)

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### What Does e-Learning Mean for the Coast Guard? (continued)

Although this definition includes training, it has a much larger meaning. For the Coast Guard, e-Learning means on-the-job performance support, online professional communities, expert exchanges, interactive technical manuals, and many more e-courses and tools that help the Coast Guard grow, use and move knowledge using electronic means where we need it and when our people want it. The Coast Guard's e-Learning Standards and Styles Guide provides a list of current e-tools and products. Note that these tools and products are called "**assets**", a term which means any electronic product, tool, course or courseware object. The Coast Guard's e-Learning Standards and Styles Guide, Appendix G, describes each of these assets and provides steps, specifications and guidelines for their development or use.

Together, these e-Learning assets make up the Coast Guard Learning Network which is a network of electronic media and tools that support workers accomplishing Coast Guard missions.

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### Responsibility

The Performance Technology Center is responsible for maintaining this SOP.

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### E-Learning Design & Development Process Overview

[Appendix A](#), Design and Development Milestones and Outputs, provides a good overview of the [e-Learning Design and Development Process](#). There are 9 milestones in any e-Learning project. They are:

- Milestone 1: Conduct Pre-design analysis/Map objectives for Course Conversion
  - Milestone 2: Draft Performance Objectives/Validate Objectives for Course Conversion
  - Milestone 3: Draft Pre-Design Document
  - Milestone 4: Draft Design Plan
  - Milestone 5: Sign Development Plan
  - Milestone 6: Develop Evaluation Plan
  - Milestone 7: Beta Test Course/Tool
  - Milestone 8: Deploy Course/Tool
  - Milestone 9: Draft Hosting, Distribution and Maintenance Plan & Debrief Project
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## SECTION II: Initiating a Request for Developing Coast Guard E-Learning

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### Who Assigns Coast Guard's E-Learning Projects?

G-WTT-1 or -5 assigns e-Learning projects. There are two methods for assigning an e-Learning project.

- The preferred method results from a Coast Guard validated analysis that typically includes recommendations for training and non-training solutions to close gaps in Skill/Knowledge (S/K), Environment (ENV), Motivation/Incentives (M/I) and Assignment/Selection (A/S). Following an out brief on analysis results and recommendations, G-WTT-1 works with the Program Manager to develop a Plan of Action and Milestones (POAM). The POAM becomes the tasking document for starting an e-Learning project.
- The Coast Guard's Training & Education Advisory Council (TAC) also assigns "greatest need" e-Learning projects to Coast Guard designers/developers and associated contractors. Examples are assignments to convert portions of existing Coast Guard courses within specific timelines or to develop General Military Training (GMT) requirements.
- Sometimes Programs approach G-WTT-1 with a small but validated need, such as a job aid to improve performance on a specific piece of equipment or a larger urgent Coast Guard need for immediate awareness "training". In this case, G-WTT-1 will typically coordinate directly with [PTC](#) to determine if they or [TRACEN Petaluma](#) can take on the project. NOTE: G-WTT coordinates with PTC first because they are the clearing house for e-Learning funding. If PTC or Petaluma are not resourced to take on the project, G-WTT-1 may contract it out from their list of approved contractors.

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### Who Does a Program Manager or Unit Contact for Development of a Coast Guard E-Learning Project?

Typically, G-WTT's performance consultants should be contacted regarding a request for a Coast Guard e-Learning project. The Coast Guard's TAC, which G-WTT chairs, is the organization that validates, prioritizes, assigns and manages cross-programmatic requests for training or performance improvement support. G-WTT's performance consultants should be the first point of contact for requests involving a need for e-Learning.

Exceptions are internal Coast Guard Training Center e-Learning needs and very small projects (i.e., a single and fairly simple job aid). Such requests might include staff training, provision of tools, consulting on a desired project to improve classroom training and so forth. The PTC and TRACEN Petaluma routinely provide internal help insofar as their resourcing allows.

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## Initiating a Request for Developing Coast Guard E-Learning (continued)

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**Who Prioritizes Coast Guard E-Learning Projects?**

The TAC prioritizes large projects with cross-programmatic impact. PTC and TRACEN Petaluma prioritize small internal projects based on resourcing and time constraints.

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**Steps to Initiate a Large e-Learning Project with Cross-Programmatic Impact**

- The client notifies his/her G-WTT representative that the Program wants to move ahead with the POAM.
  - G-WTT representative establishes contact with PTC's Design and Development Branch to set up a pre-alignment meeting. The meeting's goal is for Design and Development Branch to present options for the project. These options depend on time, costs and developer source (PTC, Petaluma, contractor)
  - If the client decides to move forward with the project, he/she must transfer funds to PTC.
  - Upon receipt of funding, PTC will coordinate an alignment meeting with the client.
  - G-WTT will attend the alignment meeting, but from that point on, G-WTT's involvement may vary.
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## SECTION III: Human-Centered Instructional Design

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### Why is a Human-Centered Focus So Important?

Before listing the procedures and steps involved in designing and developing Coast Guard e-Learning, this SOP will discuss the focus each Coast Guard e-Learning designer and developer must have before beginning the design process.

Why is this focus so important?

The Coast Guard achieves its missions through the performance of its people. Every online course developed and every performance support tool produced is for their use. The users -- Coast Guard men and women – must therefore be the focus of e-Learning design and development efforts. This focus means designers and developers must go beyond defining the technical functions of a course or using the mechanics of classical instructional design. They must also ask two fundamental questions:

- How do we get people to engage with e-Learning?
- How do we design e-Learning so that it immerses users in the actual performance of their jobs?

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### Human-Centered Instructional Design

Coast Guard e-Learning designers and developers believe they answer those two fundamentals by focusing on human-centered instructional design. This focus combines science and art. The “science” part is classic instructional design techniques that are well documented and understood - for example, sequencing, chunking and media selection. Using these design techniques helps achieve the goal of getting learners engaged.

However, really great instructional design goes beyond science into art. Its goal is to immerse learners in the performance - make them feel as if they are actually in the situation - have them see immediate and lasting relevance and value what is happening. To design e-Learning that immerses learners in performance, designers must struggle with human challenges:

- Motivation
- Engagement
- Human connection
- Identity
- Self-efficacy
- Clarity
- Learning guidance
- Metaphors
- Construction

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Continued on next page.

## Human-Centered Instructional Design (continued)

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### Human-Centered Instructional Design (continued)

Human-centered instructional designers ask the following questions **BEFORE** starting an e-Learning project:

1. Once we know what the job and tasks are, how do we get learners to “get” it?
  2. How do we get them interested in the first place?
  3. How do we keep them interested? When do we need to “lay it on” motivationally?
  4. How do we link instruction/performance support to intrinsic motivators?
  5. What is the value of this performance to the learner?
  6. How can we create dynamic situations using a fairly static medium?
  7. How can we best communicate skills, procedures, or knowledge?
  8. How can we make sure instructional text is aimed at the right level? (Fog index)
  9. How much information should we put on a screen, or in a lesson module? (Clarity)
  10. How can we create foundational instructional moments to make students’ “light bulbs” go on and then make them more conspicuous?
  11. How do we reduce distraction?
  12. How do we make instruction relevant to life now, and to the performance on the job? How do we put the learners right in the middle of the real-life job choices, environment, and stimuli they will experience on the job? How do we make learning happen in the context of the real-world performance? How do we make the learning experience seem like real-life?
  13. How do we encourage learners to value the performance?
  14. How do we get learners to believe their efforts are the make-or-break factor to achieving success?
  15. How do we tie the outcomes of this learning to valued states-of-being for the learners?
  16. How do we get people to connect with human things in the training?
  17. Are there opportunities for people to interact with other people in this training?
  18. Is there an appropriate identity factor that we can tie to learning outcomes? (e.g., Identity: 1) Who I am (capabilities, attributes, values, plans); and 2) What I can do (capability, skill, prowess).
  19. Do we give opportunity for student expression in our learning?
-

## Human Centered Instructional Design (continued)

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### **Pre-Design Analysis**

Coast Guard e-Learning designers answer these questions by incorporating a pre-design analysis process into design efforts.

During pre-design analysis, designers determine:

- The type of performance learners must do after instruction.
- The context in which the performance takes place on the job.
- Who the learners are in terms of their motivation issues, skill levels, interests, community attributes.
- The instructional strategies likely to work best given what is known about performance and learners.

Although Coast Guard designers and developers consider classical instructional design techniques such as sequencing, chunking, and media selection very important, these techniques are secondary to first defining who learners are and what they need to accomplish. Once those critical questions are adequately answered, designers use that information to determine the best approaches for instructional design.

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## Human-Centered Instructional Design (continued)

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### Performance and Context

Coast Guard e-Learning designers use the outputs of a SABA Peak Performance System front-end and pre-design analysis to determine type of performance, as well as the context in which that job is performed. If design and development work is proceeding from a different type of analysis or an emergency need, designers may have to perform some of the SABA Peak Performance pre-design analysis work to properly identify performance and establish the context for that performance.

<b>If:</b>	<b>Then:</b>
Condition:	Action:
<ul style="list-style-type: none"> <li>• FEA done</li> <li>• Tasks described to step level</li> <li>• Tasks with decision points paradigmed</li> <li>• Tasks filtered through job aid vs. memory algorithm</li> <li>• Parameters &amp; constraints identified</li> </ul>	<p>Proceed with remaining pre-design steps (target audience identification, Learner Motivation assessment, etc.).</p>
<p>No FEA or pre-design analysis done</p>	<ul style="list-style-type: none"> <li>• Work with accomplished performer to describe each task to step level.</li> <li>• Paradigm task decision points.</li> <li>• Filter tasks through job aid vs. memory algorithm (link to that page in Job Aid SOP).</li> <li>• Identify parameters &amp; constraints.</li> <li>• Continue on with remaining pre-design steps.</li> </ul>

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## Human-Centered Instructional Design (continued)

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### Link Between Who Learners Are and Motivation Design

Another aspect of pre-design analysis work involves determining who learners are. One part of this effort is classic target audience identification which answers questions such as:

- To what type of unit are they assigned/what billet will they fill?
- What pay grades are typically assigned to this job?
- What training/education do they already have?
- What skill sets do they already have?
- What prior work experience do they have?
- What are their reading/math levels?

Another part of this effort, however, is finding out what motivates students who will use the e-Learning tool or take an e-Learning course. Coast Guard e-Learning designers believe identifying motivational factors is key to successful e-Learning since e-learners often feel “disconnected” and unmotivated. When an e-learner using an asynchronous tool or course is disenchanted, he or she will not continue. The product is a failure if this happens again and again.

To counter the e-Learning “drop-out” problem, Coast Guard designers conduct a Learner Motivation Assessment using John Keller’s Attention Relevance Confidence Satisfaction (ARCS) Motivation Model to assess and design motivational interventions. Coast Guard “best practice” is to conduct a learner motivation assessment during the pre-design analysis process, and then conduct assessments of specific blocks of instruction as they are designed and alpha-tested.

**NOTE:** For those SOP users who want to know more about the ARCS model, a good overview of Keller’s model is presented in “Motivation Systems” from the *NSPI Handbook of Human Performance Technology*, Josey-Bass Publishers, San Francisco 1992. Penn State also hosts a site that describes ARCS Motivation Model applications at <http://ide.ed.psu.edu/idde/ARCS.htm>.

[Appendix B](#) of this SOP lists the steps involved in using the ARCS Motivation model to help incorporate motivational interventions into e-Learning design.

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## SECTION IV: E-Learning “New Start” Design and Development Procedures

These following steps apply to a “start-up” e-Learning project. More detailed explanations, outputs, and milestones are found in [Appendix A](#), Design and Development Milestones and Outputs.

The next section will detail steps used for converting resident courses to e-Learning.

### Conduct Pre-Design Analysis:

Step:	Who:	Action:										
1	Project Lead/ISD	Create Project files. See Appendix A to determine what documents go in project files.										
2	Project Lead with Team	Determine target audience and draft Learner/Performer Profile										
3	Project Lead with Team	Conduct motivation assessment. NOTE: ARCS model use is optional; not mandatory.										
4	Project Lead with Team	Find performance’s major accomplishments, tasks and steps from a previous performance analysis.										
5	Project Lead with Team	<table border="1"> <thead> <tr> <th>IF</th> <th>THEN:</th> </tr> </thead> <tbody> <tr> <td>Analysis does not include accomplishments</td> <td>Identify performance’s major accomplishments.</td> </tr> <tr> <td>Analysis does not include job aid vs. memory analysis for all tasks</td> <td>Put tasks through SABA’s Peak Performance job aid vs. memory algorithm found in Pre-Design Analysis Job Aid.</td> </tr> <tr> <td>Tasks with decision points are not paradigmmed</td> <td>Paradigm those tasks with decision points using SABA’s Peak Performance Pre-Design Analysis Job Aid.</td> </tr> <tr> <td>Analysis does not include parameters and constraints</td> <td>Identify parameters and constraints using SABA’s Peak Performance System Job Aid for Pre-Design Analysis</td> </tr> </tbody> </table>	IF	THEN:	Analysis does not include accomplishments	Identify performance’s major accomplishments.	Analysis does not include job aid vs. memory analysis for all tasks	Put tasks through SABA’s Peak Performance job aid vs. memory algorithm found in Pre-Design Analysis Job Aid.	Tasks with decision points are not paradigmmed	Paradigm those tasks with decision points using SABA’s Peak Performance Pre-Design Analysis Job Aid.	Analysis does not include parameters and constraints	Identify parameters and constraints using SABA’s Peak Performance System Job Aid for Pre-Design Analysis
		IF	THEN:									
		Analysis does not include accomplishments	Identify performance’s major accomplishments.									
		Analysis does not include job aid vs. memory analysis for all tasks	Put tasks through SABA’s Peak Performance job aid vs. memory algorithm found in Pre-Design Analysis Job Aid.									
Tasks with decision points are not paradigmmed	Paradigm those tasks with decision points using SABA’s Peak Performance Pre-Design Analysis Job Aid.											
Analysis does not include parameters and constraints	Identify parameters and constraints using SABA’s Peak Performance System Job Aid for Pre-Design Analysis											
6	Project Lead with Team	Assemble existing content.										

### Draft Performance Objectives/Prepare for Alignment Meeting

<b>Step:</b>	<b>Action:</b>	<b>Who:</b>
1.	Convert major accomplishments and tasks to valid terminal performance and enabling objectives.	ISD
2.	Identify sponsor/client, development project team, SMEs and other stakeholders.	ISD
3.	Ask each sponsor/stakeholder pre-alignment questions.	ISD
4.	Develop Alignment Agreement from template found in Appendix B.	ISD
5.	Hold alignment meeting with sponsor.	Project Lead with Team
6.	You and sponsor sign the Alignment Agreement.	Project Lead and Sponsor

## Pre-Design Document Preparation

Step:	Action:	Who:
1.	Enter alignment information from project alignment sheet to Pre-Design Document (or include copy of alignment sheet in project folder).	ISD
2.	Attach SABA Peak Performance System applicable Analysis and Pre-Design Analysis Worksheets (if project stems from analysis).	ISD
3.	Conduct a Learner Entry-Skill Assessment.	ISD
4.	Conduct an overall learner motivation assessment.	ISD
5.	Refine conversion of accomplishments and tasks to performance objectives.	ISD
6.	Describe any constraints to the project/performance.	ISD
7.	Describe existing content sources.	ISD
8.	Describe overall asset approach/philosophy.	ISD
9.	List Major Accomplishments.	ISD
10.	Describe Presentation Approach.	ISD
11.	Describe Practice Approach.	ISD
12.	Describe Feedback Techniques.	ISD
13.	Describe assessment approach (evaluation strategies).	ISD
14.	Describe transfer/contextualization tactics.	ISD
15.	Use templated table to describe plan for matching specific tactics/presentations with objectives.	ISD
16.	Develop Level 2 test questions/scenarios to match each objective.	ISD
17.	Outline the objective presentation sequence.	ISD

## Develop Design Plan

Step:	Action:	Who:
1.	Develop screen-by-screen content.	ISD
2.	If EPSS, diagram actions of different buttons or functions of the tool.	ISD
3.	Develop a flow chart that represents the flow of the course design.	ISD
4.	Using the Design Document template, identify requirements of other screen elements.	ISD
5.	Describe in detail screen-by-screen practice and assessment activities.	ISD
6.	Draft scripts for every video/audio component.	ISD
7.	Develop storyboards. (Sample storyboard found in Standards and Styles Guide).	ISD
8.	Develop a lesson or tool module “Look and Feel” Preview.	ISD
9.	Submit media development requests for graphics.	ISD
10.	<p>Work with team and sponsor to identify all resources required to develop the asset to specs defined in design document. Use Greer ISD Project Management model to describe project labor.</p> <p>NOTE: Greer ISD PM Model is a good tool to use for describing project labor.</p>	ISD

### Sign Development Plan

Step:	Action:	Who:
1.	Schedule project update meeting,	Project Lead with Team
2.	Obtain alignment on documented development plan.	Project lead with Team

### Develop Evaluation Plan

Step:	Action:	Who:
1.	Using standard processes for formative and summative evaluation, draft Evaluation Plan that includes responsibilities, date/task milestones and specific deliverables.	ISD
2.	Develop Alpha-Test Plan. See <a href="#">Appendix A</a> , Design and Development Milestones and Outputs.	ISD
3.	Develop Alpha test checklist evaluation.	ISD
4.	Develop the Beta-Test Plan. See <a href="#">Appendix A</a> , Design and Development Milestones and Outputs.	ISD
5.	Conduct Technical Peer Review on one module unless user interface and design change. See Appendix C for checklist.	ISD

### Beta Test Course/Tool

<b>Step:</b>	<b>Action:</b>	<b>Who:</b>
1.	Define observable criteria that signal asset is ready for piloting.	ISD
2.	Create course evaluation log/checklist.	ISD
3.	Assign evaluation personnel to describe the pilot evaluation process.	Project leader with team
4.	Describe funding and requirements for students, evaluators, instructors & materials.	Project leader with team
5.	Draft milestones Schedule.	Project leader with team
6.	Conduct Beta Test.	ISD
7.	Create Revision Log for recommended and completed revisions.	ISD

### Deploy Course or Tool

Step:	Action:	Who:
1.	Articulate cultural barriers to roll-out.	Project leader with team
2.	Articulate marketing needs/plan.	Project lead with team
3.	Identify who needs buy-in.	Project leader with team
4.	Articulate hosting/delivery methods and obstacles.	Project leader and team

### For Project Debrief, Draft Hosting, Distribution & Maintenance Plan

Step:	Action:	Who:
1.	Describe all technical hosting or distribution requirements to include costs and vendors.	Project Lead with team
2.	For courseware, include Learning Network “share” costs: <ul style="list-style-type: none"> <li>• \$1K annually for synchronous courses.</li> <li>• \$2K annually for asynchronous courses.</li> <li>• NOTE: This fee is to help pay for the Coast Guard’s e-Learning infrastructure. See Glossary.</li> </ul>	Project Lead with team??
3.	Draft Maintenance Plan with responsibilities including funding and hosting resources.	Project lead with team
4.	Draft a “Lessons Learned” Memo/Summative Evaluation. See <a href="#">Appendix A</a> , Design and Development Milestones and Outputs.	Project Lead with team

## Section V: E-Learning Course Conversion Design and Development Procedures

The previous section dealt with steps to follow for any “new start” e-Learning course or tool. The next steps apply to specific different steps required in the **pre-design analysis** and **draft performance objectives/prepare for an alignment meeting** sections of e-Learning design and development process as those sections apply to existing course conversion. More detailed explanations, outputs, and milestones are found in Appendix A, Design and Development Milestones and Outputs.

### Pre-Design Analysis

Step:	Action:	Who:
1.	School personnel will collect and compile all documentation required for project (see Appendix A.	School Personnel
2.	Locate each objective for the existing course	School personnel
3.	Cite page numbers of all course content that is associated with objective in margin to the right of each objective.	School personnel

### Draft Performance Objectives/Prepare for Alignment Meeting

<b>Step:</b>	<b>Action:</b>	<b>Who:</b>
1.	Draft recommended objectives to replace existing ones that do not meet objective articulation standards.	Development Team
2.	Identify existing objectives that do not appear to relate to performance and recommend their deletion from curriculum outline.	Development Team
3.	Develop draft listing of valid objectives for the existing course.	Development Team
4.	Draft Level 2 Test Items to match each objective.	Development Team
5.	Meet with Training/Performance Provider and Sponsor to sign alignment document.	Project Lead and Development Team

## SECTION VI: Review and Evaluation

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<b>Introduction</b>	The most important benefit the Coast Guard can gain from an e-Learning SOP is one, standardized evaluation system for all training sponsored by the formal training system.
<b>Purpose</b>	In a world of shrinking Federal budgets, it is very important for the Coast Guard to identify valid evaluation and Return-On-Investment (ROI) data for all of its performance investments.
<b>Target Audience</b>	This section of the SOP is targeted toward Coast Guard e-Learning course designers and developers, contractors doing the same work, and Coast Guard Program Managers.
<b>Background</b>	The Coast Guard's Evaluation SOP defines procedures to use for all Coast Guard evaluations. Given the special nature of some of the e-Learning tools developed for "blended" solutions, there may be specialized evaluation techniques for determining ROI for novices using such tools. Such specialized evaluation techniques should be approved by Program Managers as part of the alignment agreement.

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## Review and Evaluation Processes

The following reviews and evaluations shall be conducted at the indicated milestones. Below is a quick-reference table describing required documents and reviewers:

Reviews/Evaluations	Peer	SME	Client	Users
Objectives & Level 2 Test Items	X		X	
Pre-Design Document	X	X	X	
Design Flowchart Storyboards	X X	X X	X X	
Initial Evaluation Technical Review Content Review	X	X		
Alpha Test (one on one)				X
Beta Test			X	X
Deployed Course (Summative Evaluation)	X	X	X	

Note: Peer reviews are recommended before any formal deliverable to client.

## Appendix A: Design and Development Milestones and Outputs

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### Milestone 1: Pre-Design Analysis

### (Mapped Objectives – for Course Conversion)

#### Outputs:

- Project File
- Target Audience Description: Skill Level, Motivation, Environment
- Detailed Task Description: Job Patterns, Accomplishments, Tasks, Steps, Paradigms
- Detailed Content Summary: A detailed description of the text, graphics, presentations, policy that already exists.
- (For Course Conversion) All the content for the existing course (Lesson Plans, References, Presentations, Notes, Handouts, Videos, etc).
- (For Course Conversion) A WORD document that lists all the objectives in the current course with page numbers from the consolidated course materials that allow for linking objectives with existing content.

#### Steps:

#### The Routine Development Steps...

1. Create project file that will contain all of the documents and files described in this process.
2. Determine who should and who should not attend or receive the training in the course to be designed. Draft learner/performer profile document that describes skill level, environment, available tools, and motivation assessment of the target population. Use Keller's ARCS model in making the motivation assessment.
3. Identify the major or critical accomplishments. Break the accomplishment down into tasks and steps (iaw Harless Peak Performance Model).
4. Assemble any existing content: text, presentations, media, and policy. Each task statement is classified by content type and job performance level (how long the content must be remembered and used).

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Continued on next page.

## Appendix A: Design and Development Milestones and Outputs (continued)

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### Milestone 1: Pre-Design Analysis

(Mapped Objectives  
– for Course  
Conversion)  
(continued)

#### For Course Conversion Only...

5. School personnel will collect and compile all lesson plans, presentations, handouts, exercises, visuals, and other course elements into a single volume or set of volumes. Each page will be numbered in red or blue ink so that each volume has clearly numbered pages.
  6. Using the approved curriculum outline, school personnel will locate each objective for the existing course.
  7. In the margin to the right of each objective, school personnel will cite the page numbers of all course content that is associated with that objective.
- 

### Milestone 2: Performance Objectives/Evaluation Items

(Validated  
Objectives – for  
Course  
Conversion)

#### Outputs:

- A listing of objectives that are truly performance oriented
- Evaluation items for the objectives
- A signed alignment document showing developer and sponsor alignment on the goals and objectives. [Note: This alignment document is the most critical pre-design document. It defines the “success” of the project in observable terms. It provides mutually agreed upon criteria.]

#### Steps:

#### The Routine Development Steps...

1. Development staff will write each objective for *Performance, Condition, and Standard*.
  2. The Objectives are derived from the analysis. The major or critical accomplishments are converted to Terminal Objectives. The tasks are written as Enabling Objectives.
  3. Identify sponsor/client, development project team, SMEs, and other stakeholders.
  4. Ask each sponsor/stakeholder:
  5. Are there any other people or organizations who have decision authority or influence?
  6. Are there any political situation to be aware of?
  7. Develop Alignment Agreement using the template in Appendix B.
  8. Training/Performance provider and Sponsor will meet and sign an alignment document that signifies agreement regarding the asset objectives and evaluation items.
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## Appendix A: Design and Development Milestones and Outputs (continued)

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**Milestone 2:  
Performance  
Objectives/Evaluation  
Items**

**(Validated  
Objectives – for  
Course  
Conversion)  
(continued)**

**For Course Conversion only...**

1. Development staff will draft recommended objectives to replace the existing ones that do not meet objective articulation standards.
2. Development will identify existing objectives that do not appear to relate to performance, and recommend deletion from curriculum outline.
3. Development staff will develop draft listing of valid objectives for the existing course.
4. After the Objectives are written Level 2 test questions/scenarios are written which match each objective. This is a straight-forward task. These evaluation items are observable responses that show learners/performers can perform the objective successfully. These are done at this time to ensure that the assessment document (Final Test) measures the learning associated with that objective.
5. Training/Performance provider and Sponsor will meet and sign an alignment document that signifies agreement regarding the asset objectives and evaluation items.

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**Milestone 3:  
Pre-Design  
Document**

**Outputs:**

- The Pre-Design Document which will include:
  - **Alignment Information** (Sponsor, Goal, Business Process, Affected Performers)
  - **Harless Analysis and Pre-Design Outputs** (if project stemmed from analysis)
  - **Paradigmed and/or Fully Articulated Accomplishments/Tasks/Steps/Substeps**
  - **Transformation of Accomplishments/Tasks/Steps/Substeps** to language of objectives
  - **Learner Entry-Skill Assessment**
  - **Learner Motivation Assessment**
  - **Project Constraints/Parameters**
  - **Description of Existing Content Sources**
  - **SME/AP Listing**
  - **Overall Asset Approach**
    - Asset Philosophy
    - Major Accomplishments
    - Overall Presentation Approach
    - Practice Approach
    - Feedback Tactics
    - Assessment Approach
    - Transfer/Contextualization Tactics
    - Objectives/Tactics Table

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## Appendix A: Design and Development Milestones and Outputs (continued)

### Milestone 3: Pre-Design Document (continued)

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- **Objective Presentation Sequence Outline**

*NOTE: Once these elements have been compiled, and the designer has a good idea of the performance and content available, a team session for planning the design should be held. This meeting should be facilitated by the Project Lead, and should include a visual specialist, other designers, and other key team members.*

**Steps:**

1. Using the Pre-Design Document, template, enter alignment information from project alignment sheet; or, include copy of alignment sheet in project folder. (Sponsor, Goal, Business Process, Affected Performers) Refer to established PTC project alignment process.
2. If used, attach Harless Analysis and Pre-Design Outputs (if project stems from analysis)
3. Learner Entry-Skill Assessment. Refer to the ISD references for different methods of accomplishing this. The entry on the Pre-design document should describe skill levels as relating to the targeted skills, and should describe the minimum reading grade level of 85% of the target audience.
4. Learner Motivation Assessment. Conduct an overall learner motivation assessment as it relates to
  - Often the question is: “To what detail do we take this?” The answer is a function of the learners’ entry level skill and knowledge, and the tools and environmental support available. Your task is to describe the performance in sufficient detail so that 90% of your target audience can perform the tasks using the step-by-step descriptions. Don’t worry about translating the tasks to the simplest form yet—that comes later. **Your goal here is to document the performance. KnowledgeNet says that at the end of this phase of pre-design, the resulting report should be so complete that reading the report will “cause learning to occur.”**

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## Appendix A: Design and Development Milestones and Outputs (continued)

### Milestone 3: Pre-Design Document (continued)

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5. **Transformation of Accomplishments/Tasks/Steps/Substeps** to language of objectives: to this point, the performance has been described as the results of analysis. It has been framed descriptively as “accomplishments” and “tasks.” Now, it is time to translate to the language of intervention. An “accomplishment” is generally described as a “Terminal Performance Objective” and a “Task” as an “Enabling Objective.”
  6. **Project Constraints/Parameters.** Describe any political, financial, or operational barriers or constraints on this project or this performance.
  7. **Description of Existing Content Sources.**
  8. **SME/AP Listing.**
  9. **Overall Asset Approach/Philosophy.** This is a two-paragraph description of the overall approach of the intervention. What technologies will be employed? How will the context of performance be reinforced? How will identified challenges or barriers be addressed?
  10. **Major Accomplishments.** List directly from earlier analysis or objective alignment process
  11. **Overall Presentation Approach.** This is a two to three sentence description of the types of scenarios and interactive strategies you anticipate using in course delivery.
  12. **Practice Approach.** This is a two to three sentence description of the types of scenarios and interactive strategies you anticipate using in practice exercises. How will you address practice feedback? How will you use other students—if at all in practice?
  13. **Feedback Tactics.** Two or three sentence general approach to feedback for students.
  14. **Assessment Approach.** Three or four sentence approach to the types of evaluation strategies you will use... tests, scenarios, projects, papers, etc...
  15. **Transfer/Contextualization Tactics.** This is a four to five sentence description of your plan for maximizing transfer and putting the training or the tool use in the context of performance.
  16. **Objectives/Tactics Table.** This templated table allows you to associate specific tactics and presentation approaches with specific objectives.
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## Appendix A: Design and Development Milestones and Outputs (continued)

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**Milestone 3:  
Pre-Design  
Document  
(continued)**

17. **After the objectives are written, Level 2 test questions/scenarios are written which match each objective.** This is a straight-forward task. These evaluation items are observable responses that show learners/performers can perform the objective successfully. These are done at this time to ensure that the assessment document (Final Test) measures the learning associated with that objective.
  18. **Objective Presentation Sequence Outline.** This is a simple outline that shows the order of presentation of objectives.
- 

**Milestone 4:  
Design Plan**

**Outputs:**

- **The Design Plan Document** which will include:
    - Screen-by-screen presentation organization in the clearest and most relevant terms, given the characteristics of the target audience. For web training, this translates directly to screen-by-screen content. For dynamic EPSS or online job aids, this may translate to a direct schematic of tool performance with screen storyboards.
    - **Course/Tool Schema:** a visual representation of the sequence and patterns of the activities
    - **Screen-by-screen media and application requirements**
    - **Screen-by-screen practice and assessment content/activities**
    - **Listing of all required graphics, animations, video, audio, etc.**
    - **Scripts for all video or audio pieces**
    - **Storyboards**
    - **“Look-and-Feel” Preview of course or tool**
    - **Draft development resource document**
- 

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## Appendix A: Design and Development Milestones and Outputs (continued)

### Milestone 4: Design Plan (continued)

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**Steps:** (for all these steps, use the Design Document template to structure your work)

1. **In your Pre-Design document**, you outlined the course in macro terms. Refer to that outline as you structure the course here to a screen-by-screen, activity-by-activity level.
2. **Screen-by-screen text content.** In the Pre-Design process the performance was captured in exhaustive terms. Now it is time to interpret and parse that description into digestible and understandable pieces. One concept that is popular in the e-Learning business is that of the *Visual Sentence*. The idea is that one unified concept should be presented on a screen at a time. The text and visual image should present and reinforce a single concept. Our standard and styles guide supports this notion—don't put very much content on one screen. Keep your presentation to a single concept. (Refer to the PTC Standards and Styles Guide)
3. **For dynamic EPSS or job aids**, you should diagram the actions of different buttons or functions of the tool. A storyboard is helpful for this step.
4. **Represent the flow of the course design** using a flow chart that shows the structure and possible paths a learner may take. A template for your use in course design is available off of the PTC core. (Contact PTC for this template) This is a visual process that has you representing individual screens or activities and how you would sequence and pattern them.
5. **Using the Design Document template**, identify the requirements of other screen elements. Describe animations, graphics, or other functions in text form. You need to be as detailed as required for a developer to develop your concept.
6. **Describe in detail screen-by-screen** practice and assessment activities

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## Appendix A: Design and Development Milestones and Outputs (continued)

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### Milestone 4: Design Plan (continued)

7. **Draft scripts** for every video or audio component of the asset.
8. **Develop Storyboards for the course.** A storyboard defines the look and feel of each screen and provides the specific media or special element development requirements of each screen. Do not worry about actual look of graphics or special media elements, but DO include text descriptions of the functions and look of these things. Storyboard each screen. PTC uses a storyboard template because the fonts and other elements of the basic screen are in keeping with the current Standards and Styles Guide direction. The text on these storyboards should look exactly like the text you will use in the course. Graphic elements can be represented by primitive graphics or text, but must be described clearly. Developers should develop from these descriptions.
9. not worry about actual look of graphics or special media elements, but DO include text descriptions of the functions and look of these things. Storyboard each screen. PTC uses a storyboard template because the fonts and other elements of the basic screen are in keeping with the current Standards and Styles Guide direction. The text on these storyboards should look exactly like the text you will use in the course. Graphic elements can be represented by primitive graphics or text, but must be described clearly. Developers should develop from these descriptions.
10. **Develop a lesson or tool module** “Look-and-Feel” Preview. This involves the construction of four to eight screens that represent the look and functions of the asset. The purpose is to get the sponsor to see the approach and structure of the course or tool prior to expending heavy resources in development.
11. **Submit media development requests** for all required graphics.
12. **Work with developers and sponsor** to identify all the resources required to develop the asset as described in the design document. Draft a short document describing the development resources (people, processes, technology, and money) required to complete the project. The Greer [ISD Project Management](#) model is an excellent tool for describing project labor.

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### Milestone 5: Signed Development Plan

#### Outputs:

- **Development Plan Document** with signatures of sponsors and Training/Performance Provider representative:

#### Steps:

1. Hold project update meeting, obtain alignment on development plan as you have documented it.
  2. Get sponsor and development organization rep to sign development plan.
-

## Appendix A: Design and Development Milestones and Outputs (continued)

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### Milestone 6: Evaluation Plan

#### Outputs:

- **Evaluation Plan Document** with specific responsibilities, milestones, and deliverables.
- **Alpha Testing Plan** with evaluation checklists/evaluation personnel/test personnel
- **Beta Testing Plan** with evaluation checklists/evaluation personnel/test personnel

#### Steps:

1. Using standard processes for formative and summative evaluation, **draft Evaluation Plan** that includes responsibilities, date/task milestones, and specific deliverables.
  2. **Develop the Alpha-test plan.** This may be pretty simple—“Will coordinate with BMC Jones to get BM”A” Students to test components...” An Alpha-test is a simple evaluation of a small component of the asset. At PTC we typically use “A” school students who are waiting for class. We will bring in five of them, have them use the component while we watch and observe.
  3. **Develop Alpha test checklist evaluation.**
  4. **Develop the Beta-test plan.** At a minimum, this plan must describe the exact population of participants, the course delivery plan, the student observation plan, step-by-step procedures and any checklist or survey evaluation forms that will be used. Your Beta-test evaluation criteria should include a method for capturing in-progress student use and learning as well as Level I student responses. The idea is to get screen-by-screen data as the pilot students are using the courseware or support tool.
  5. **Conduct Technical Review** (Peer) and Content Review (SME).
  6. **Conduct Alpha testing** on one module unless user interface and design change. (*Use the checklist in Appendix C*)
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## Appendix A: Design and Development Milestones and Outputs (continued)

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**Milestone 7:  
Beta Test  
Course/Tool**

**Outputs:**

- Revised course ready for deployment

**Steps:**

1. Definition of “ready for beta test”—define observable criteria that signal the asset is ready for piloting.
  2. Create course evaluation log/checklist
  3. Assign evaluation personnel and describe the pilot evaluation process
  4. Describe means and requirements for funding for students, evaluators, instructors, materials
  5. Draft Milestones Schedule
  6. Conduct Beta Test.
  7. Create Revision Log for recommended and completed revisions.
- 

**Milestone 8:  
Deployed  
Course/Tool**

**Outputs:**

- Deployed course or tool
- All required technical/distribution methods identified

**Steps:**

1. Articulate cultural roll-out barriers
  2. Articulate marketing needs/plan
  3. If marketing is issue, who needs to “buy in”
  4. Articulate hosting/delivery methods and obstacles
- 

**Milestone 9:  
Hosting,  
Distribution, and  
Maintenance Plan,  
Project Debrief**

**Outputs:**

- Hosting Requirements
  - Distribution Requirements
  - Sustainment Agreements with Maintenance Funding
  - Maintenance Plan
  - Lessons Learned Memo for Project
- 

Continued on next page.

## Appendix A: Design and Development Milestones and Outputs (continued)

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**Milestone 9:  
Hosting,  
Distribution, and  
Maintenance Plan,  
Project Debrief  
(continued)**

**Steps:**

1. Describe all technical hosting or distribution requirements with costs and vendors listed.
  2. If courseware, include Learning Network “Share” costs (\$1000 annually for synchronous courses and \$2000 annually for asynchronous courseware). This fee is assessed to help pay for the infrastructure of the Coast Guard’s e-Learning system. See glossary for more information.
  3. **Draft Maintenance Plan** with responsibilities including funding and hosting resources.
  4. Last, gather the design and development team and put together a “**Lessons Learned**” memo or **Summative Evaluation**. This need not be formal, but should include comment about the success/failure of the asset’s approach, applicability to the target audience, performance effectiveness, technical performance, support limitations, and recommendations for future projects.
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## Appendix B: The ARCS Model of Learner Motivation

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**Introduction**

The ARCS model provides a method for assessing the motivation levels of learners.

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**Purpose**

Coast Guard e-Learning designers and developers shall use the ARCS Learner Motivation Model to describe target audience motivational characteristics and to guide design of motivational tactics.

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**Target Audience**

The target audience for this appendix are Coast Guard designers, developers and contractors developing e-Learning products or tools for the Coast Guard. Coast Guard e-Learning designers and developers shall conduct a motivational assessment for the target audience(s) identified in every asset development project. The ARCS Learner Motivation Model is an excellent tool to use to describe target audience motivational characteristics and to guide design of motivational tactics.

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**Background**

The Coast Guard requires use of a Learner Motivation Assessment to counter the high probability that many students will “drop-out” of e-Learning courses when they become bored or disenchanted. First assessing what motivates Coast Guard students and then building appropriate motivational interventions into e-Learning courseware helps ensure students will “stay the course.”

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## Appendix B: The ARCS Model of Learner Motivation (continued)

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### ARCS Dimensions

Keller lists four basic components of motivation:

**Attention** Capturing interest of Coast Guard people, stimulating curiosity to learn.

**Relevance** Meeting personal needs or goals of the learner to affect a positive attitude.

**Confidence** Helping learners believe they will succeed and that success is based on their effort.

**Satisfaction** Reinforcing accomplishment (intrinsic and extrinsic).

Attention and Relevance can be boiled down to the question: “How is this learning valuable and stimulating to the learners?”

Confidence and Satisfaction can be reduced to the question: “How can I help learners succeed and allow them to control their outcomes?”

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### The ARCS Model of Learner Motivation

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#### Using the ARCS Model

The ARCS model provides a method for assessing the motivation levels of learners, and provides structure for planning appropriate motivational interventions.

1. **Assess.** First assess the motivational status in each of the four dimensions to determine the target learner group’s motivational characteristics.
  2. **Identify Motivation Challenges.** Next identify the challenge dimensions – those very high or very low areas that need to be addressed.
  3. **Plan.** Develop a plan of interventions appropriate to your target audience, targeting the challenges identified in step 2 above.
  4. **Act.** Implement the interventions to bring all four ARCS dimensions into the optimal range.
-

## Appendix C: Quick Reference Table

### Quick Reference Table for E-Learning Design and Development Project Required Documents & Deliverables

Below is a quick-reference table describing e-Learning project required documents and products. Process descriptions and milestones are found in Appendix A (link), Design and Development Milestones and Outputs.

<b>Required Documents/Deliverables:</b>	<b>Reference:</b>
Alignment document: Performance objectives Evaluation items for each objective	See milestone 2
Pre-design document:	See milestone 3
Design Plan Hosting and Distribution requirements	See milestone 4
Development Plan	See milestone 5
Evaluation Plan	See milestone 6
Pilot Plan Beta Test version of courseware	See milestone 7
Final version of courseware	See milestone 8
Lessons Learned Memo for project Maintenance Plan, if applicable	See milestone 9

## Appendix D: Teams Develop Coast Guard e-Learning

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<b>The e-Learning Team</b>	Producing effective e-Learning products requires a team composed of people from several disciplines with different specialties. To produce “one team” from a group of individuals with multi-discipline expertise calls for direction, coordination, training, and supervision.
<b>Define Roles &amp; Responsibilities</b>	It is important to define the goals, responsibilities, and expectations of each team member and how they will work as a team very early in the project’s life. Production of quality products depends on this key point.
<b>Team Make-up</b>	The make-up of the development team depends on the characteristics of the proposed Interactive Media Instruction (IMI) and the authoring software selected for the project. Team members may perform some or all of the activities shown in Design and Development Team Roles.
<b>Contractor Assistance</b>	As the Coast Guard increasingly explores and uses emerging instructional and performance support technologies, the roles of course designer and developer will often be performed by contractors – people skilled and experienced in their specialty, but unfamiliar with Coast Guard content, culture, roles, responsibilities and procedures. The more reliance the Coast Guard puts on contractors, the more important it is for Coast Guard managers to understand the procedures for performing e-Learning course design and development work. Without a thorough knowledge of Coast Guard procedures for developing e-Learning products, Coast Guard managers will not be able to adequately review and approve contractor-developed e-Learning.
<b>Do We Still Need Coast Guard People to Design e-Learning Products?</b>	The answer to that question is “yes!” We understand the culture and course content best, so Coast Guard subject matter experts, instructors, course designers and developers will always be needed to “interpret” how to convert tasks to the Coast Guard way of doing business.

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## Design and Development Team Roles

The three prime roles directly involved with every e-Learning project are the:

- Project Lead
- Instructional Systems Designer (ISD)
- Media Lead

The table below lists the tasks performed by these roles.

### Roles on a Design and Development Team

Role	Tasks
<b>Project Lead</b>	<ul style="list-style-type: none"> <li>• Acts as the visionary for the project</li> <li>• Identifies Project Team</li> <li>• Establishes Project Structure (Technical Configuration, Project File)</li> <li>• Creates Project Vision Document</li> <li>• Assigns daily tasks to ISD and SME (if available)</li> <li>• Establishes and keeps project timelines</li> <li>• Attends weekly project briefings</li> <li>• Establishes liaison with Production Coordinator for media needs</li> <li>• Establishes liaison with Technical Support as necessary</li> </ul>
<b>ISD</b>	<ul style="list-style-type: none"> <li>• Creates Project File</li> <li>• Performs tasks assigned by Project Lead</li> <li>• Follows Coast Guard Design and Development Process</li> </ul>
<b>Media Lead</b>	<ul style="list-style-type: none"> <li>• Maintains consistency of presentation style and quality</li> <li>• Acts as primary media consultant for a project</li> <li>• Suggests media approaches</li> <li>• Assesses feasibility of design approaches from media perspective</li> </ul>
<b>SME (ad hoc)</b>	<ul style="list-style-type: none"> <li>• Acts as the expert on content</li> <li>• Supports project as assigned by Project Lead</li> </ul>
<b>Developer Support (ad hoc)</b>	<ul style="list-style-type: none"> <li>• Establishes Project Structure (Directory)</li> <li>• Acts as primary technical consultant for a project</li> <li>• Suggests technical approaches</li> <li>• Assesses feasibility of design approaches from technical perspective</li> </ul>
<b>Peer Reviewer 1</b>	<ul style="list-style-type: none"> <li>• Conducts scheduled reviews of sections of product</li> </ul> <p><b>NOTE:</b> Recommend same peer reviewers throughout project to maintain consistency and minimize left-field critique.</p>
<b>Peer Reviewer 2</b>	<ul style="list-style-type: none"> <li>• Same</li> </ul>

### Other Roles that Support the Design and Development Team

<b>Project Manager</b>	<ul style="list-style-type: none"><li>• Determines overall project priorities</li><li>• Manages personnel and resources</li><li>• Establishes and manages project timelines</li></ul>
<b>Production Coordinator</b>	<ul style="list-style-type: none"><li>• Coordinates media and technical development assignments</li><li>• Manages media development</li><li>• Coordinates media development with Project Leads and Project Manager</li><li>• Identifies media development personnel or tool needs to Project Manager</li></ul>
<b>Media Developer</b>	<ul style="list-style-type: none"><li>• Not assigned to a specific project</li><li>• Takes assignments from Production Coordinator</li></ul>

## Appendix E: Alignment Agreement Template

<b>Alignment Meeting Date</b>	Date of alignment meeting or date of signature
<b>Purpose</b>	Goal of project
<b>Description</b>	One line description of asset to be produced
<b>Format</b>	Brief description of asset type, design focus
<b>Media</b>	Name media asset and development tool.
<b>Target Audience</b>	List target audience types.
<b>Project Roles</b>	Identify unit, person, and project role for sponsor, developer, SME, and any other necessary stakeholders.
<b>Documentary Sources of Information</b>	List known sources of information.
<b>Project Completion Date</b>	Provide the projected date of completion.
<b>Follow-on Maintenance and Review</b>	Describe future requirements or indicate when such will be available.
<b>Final Report Delivery</b>	Project when final report will be delivered.

Recommended for Approval \_\_\_\_\_  
 Name Design/Development Branch Chief

Approved/Disapproved \_\_\_\_\_  
 Sponsor/Client Office Designation

## Appendix F: Interface Design Checklist

### Structure

**Design hierarchy is broad rather than deep.**

### Navigation

Labels clearly indicate the function of links.

Feedback tells users where they are in the course/lesson/EPSS.

Navigation elements are clear and consistent.

Links to the homepage and to high-level categories are provided.

Navigation design has been tested:

1. Do users know how to find the information they need?
2. Does navigation design connect all related information in a sequence that makes sense to users?
3. Do users know where they are in the course structure?
4. Do users know how to return to points they visited previously?
5. Are there any unnecessary links that clutter the navigation design?

### Visual Layout and Elements

Visual design enhances/reflects the goal of the course.

Course complies with Standards and Styles Guide.

Consistent visual identity is maintained.

Content presented efficiently and clutter avoided.

Use of scroll boxes whenever possible.

### Media

**Provide user controls for visual and auditory content.**

Preload media elements for speed of playback.

### Text

Headings are consistent with navigational menus.

Links are separate from narrative text blocks.

Users can print groups of related pages if necessary.

**Appendix G: Standards and Styles Guide**