



**USMC College of Distance Education and Training
Marine Corps University**

**MarineNet
Content Development Technical**

Standards Version 3.1

08 October 2020



UNITED STATES MARINE CORPS
COLLEGE OF DISTANCE EDUCATION AND TRAINING
TRAINING AND EDUCATION COMMAND
2076 SOUTH STREET
QUANTICO, VA 22134

IN REPLY REFER TO:
1000
3 Nov 2020

From: Digital Content Department Head, College of Distance Education and Training
To: Distribution List

Subj: MARINET CONTENT DEVELOPMENT TECHNICAL STANDARDS 3.1

1. MarineNet Content Development Technical Standards (MNCCTS) provides technical specifications to develop and integrate electronic training and education products for delivery via the MarineNet Learning Management System (LMS) on the Marine Corps Enterprise Network (MCEN).
2. This MNCCTS version supersedes version 3.0 dated 17 Nov 2017 and all previous versions.
3. This document applies to all USMC and other organizations seeking to deliver training and education content via MarineNet.
4. Major changes to version 3.1 include:
 - a.
5. These standards are managed and enforced by the CDET Digital Content Department (DCD), cdet_courseware@usmc.mil.



Ryan Bair

ABSTRACT

This document defines the technical standards required for content developed for delivery on the Marine Corps Distance Learning Network (MarineNet). The College of Distance Education and Training (CDET) is committed to promoting reusability, durability, accessibility, interoperability, maintainability, and portability of distance learning content.

The technical standards outlined in this document represent a combination of specifications for the various systems and technologies implemented by the current version of MarineNet (MarineNet 6.2). Requirements in this document reference the target deployment environments. Vendors developing content for hosting on MarineNet shall consult their Statements of Work (SOW) to determine the target deployment environments.

Department of Defense Instruction (DoDI) 1322.26 mandates that electronic courseware shall be developed in compliance with the latest possible version of the Shareable Content Object Reference Model (SCORM®). This document assumes that the reader has a thorough understanding of the applicable SCORM® guidelines.

The standards in this document are effective at the time it was written and may be updated to accommodate changes needed to allow content to effectively run on MarineNet. Developers should verify the accuracy and timeliness of this information prior to developing any content. Updates to this document will be made when necessary to update, modify and clarify the standards provided in this document. The latest version of this document is available from the MarineNet program manager.

VERSION HISTORY

The following table provides a version history for this document. As the document continues to be updated, this table will reflect the changes made to this document.

Version	Significant Changes	Date
1.0	Provides standards for MarineNet courseware and test development	01/24/2008
1.1	Added guidance in Section 6.3.1	01/30/2008
1.2	Modified guidance, including guidance to resolve the premature course completion issue, non-streaming file size parameters, bandwidth limitations, and other technical issues	11/13/2008
1.3	Updated streaming and non-streaming file size parameters, and Microsoft® Windows Media Player guidance	07/07/2009
2.0	Revision of multimedia file format and size requirements; removal of Microsoft® Windows media streaming requirements; and addition of new sections regarding MarineNet Product Integration Testing, MarineNet Library and Library Objects, and MarineNet Completion Certificates	07/18/2012
3.0	Updated guidance regarding Adobe Flash and Flash based media development, usage of HTML-5 in development for MarineNet and SCORM properties. Revision of the MarineNet Functionality Review Checklist and MarineNet Integration Testing Checklist.	11/15/2017
3.1	Updated general guidance for testing performed by DCD instead of the DLNOC. Removed outdated information. Removed the restriction on scrollbars for content. Removed content window resolution restriction.	08/10/2020

TABLE OF CONTENTS

1.	INTRODUCTION	3
1.1	About This Guide	3
1.2	Intended Audience	3
1.3	DCD Mission Statement	4
1.4	General Information	4
1.5	Content Access	5
1.5.1	MarineNet Garrison Environment	5
1.5.2	MarineNet Internet Environment	5
2.	DESIGN AND DEVELOPMENT GUIDELINES	6
2.1	Hardware Baseline	6
2.2	Operating System Baseline	6
2.3	Software Baseline	6
2.4	Additional Software or Plugins	7
2.5	Software Use in Content Development	7
2.6	Browsers	7
2.7	Server Communication	8
2.7.1	Server Variables in MarineNet Distributed Environment	8
2.7.2	Server Variables and Data Storage	8
2.7.3	Server-side and Client-side Web Cookies	8
2.7.4	Server-side Scripts or Technologies	8
2.8	Network Connectivity	8
3.	MULTIMEDIA REQUIREMENTS	9
3.1	Acceptable Images	9
3.2	Image Format	9
3.3	Supported Audio and Video Formats	9
3.4	Acceptable Response Times	10
4.	CONTENT DEVELOPMENT AND PACKAGING	11
4.1	Courseware Reuse and Open Source	11

4.2	External Content Requirements	11
4.3	Courseware Size	11
4.4	Screen Display Resolution	11
4.5	Embedded Resources	11
4.6	Interactions with the LMS	12
4.6.1	Global Variables	12
4.6.2	Bookmark Functionality	12
4.6.3	Completion Configuration	12
4.6.4	MarineNet Certificates	13
4.7	Content Launch Window	14
4.7.1	HTML-5	14
4.7.2	Additional Windows while Launching Courseware	14
4.7.2.1	Courseware Launch Window Sizing	14
4.7.2.2	Content Launched in a Separate Window	16
4.7.2.3	Content Launched Within the Content Area	16
4.8	SCORM Engine	18
4.8.1	SCORM Manifest and Rollup Rules	18
4.8.2	MarineNet SCORM Engine Default Properties	19
4.8.3	SCORM Errors	20
4.8.4	Courseware Completion Issue	21
4.8.5	Correct IMSMANIFEST	22
4.8.6	Incorrect IMSMANIFEST	23
5.	QUESTIONMARK® EOC EXAMS AND SURVEYS	24
6.	SECTION 508 COMPLIANCE	25
	APPENDIX A: COURSEWARE SOFTWARE ENVIRONMENT	26
	APPENDIX B: MARINENET FUNCTIONALITY REVIEW CHECKLIST	31
	APPENDIX C: MARINENET INTEGRATION TESTING CHECKLIST	42
	APPENDIX D: MARINENET ACCEPTABLE FILE TYPES	57
	APPENDIX E: LIST OF ABBREVIATIONS	65

1. INTRODUCTION

The United States Marine Corps was founded in 1775, even before our nation was officially formed. This elite group of men and women live by a strict code of integrity and ethics, producing not just strong warriors but people of exceptional character. Today, approximately 180,000 Marines are stationed around the world at all times, ready to deploy quickly whenever and wherever needed.

The College of Distance Education and Training (CDET) is the organization within the Marine Corps Education Command (EDCOM) with the mission to design, develop, deliver, evaluate, manage, and resource distance learning products and programs across the Marine Corps training and education continuum in order to increase operational readiness. CDET is a total force educational institution: it serves all U.S. military forces and DoD government agencies, as well as international military forces throughout the globe.

CDET programs and courses concentrate on the leadership, warfighting, and staff development skills of the nation's military, and feature the educational standards, learning areas, and learning objectives for enlisted and officer Professional Military Education (PME) as well as Joint Professional Military Education (JPME) programs. These programs and courses are accessible globally through a variety of delivery systems. Distance learning capabilities are provided via the online learning management system, MarineNet that provides education to students wherever they are stationed.

1.1 About This Guide

This guide defines the technical standards required for content being developed for delivery on the Marine Corps Distance Learning Network (MarineNet). The USMC Training and Education Command (TECOM) College of Distance Education and Training (CDET) is committed to promoting reusability, durability, accessibility, interoperability, maintainability, and portability of distance learning content. The MarineNet Learning Management System (LMS) is a web-based information system that delivers training to Marines, manages training information and provides training collaboration in both resident and nonresident training environments. MarineNet users can access training from anywhere they have access to a computer and the internet—office, home or learning resource centers (LRCs). Users can meet their distributed learning needs on a 24/7 basis. Courseware hosted by MarineNet is provided by many sources external to the organization. This courseware can range from relatively simple, single-lesson presentation formats to complicated interactive multimedia instruction (IMI) structured as courses that are part of a larger curriculum, with each course having multiple modules, lessons, exams, evaluations and surveys.

Each of these training objects must be developed, tested and validated to operate properly on the MarineNet LMS. With the expanding use of the LMS, growing complexity of content and the Marine Corps' increased dependency on distributed learning, the Digital Content Department identified the need for a MarineNet Content Development Technical Standards (MNCDDTS) guidelines and best practices document.

1.2 Intended Audience

Courseware developers (programmers) are the primary intended audience of the MNCDDTS

document. This document is meant to be used as a reference guide for the courseware programmer. Many of the sections reference code and technical aspects that require background knowledge in content or courseware structure and development from a distributed learning perspective. The document also refers to the Sharable Content Object Reference Model (SCORM), JavaScript, and general web-based programming and design aspects. While it targets experienced SCORM developers, it can also be used as a reference for instructional system designers, content or courseware testers, project or technical managers, and anyone planning to produce content for use on MarineNet.

1.3 DCD Mission Statement

The Digital Content Department (DCD) produces and manages distributed learning and performance support solutions for the USMC Total Force via military occupational specialty (MOS) skill progression training, pre-deployment training (PDT), entry-level training, and cross- functional training applicable across each training and readiness continuum in order to increase the operational readiness of the Marine Corps.

1.4 General Information

MarineNet is a complex system that utilizes and incorporates the following components:

- Centralized Learning Management System (LMS) which supports requirements generated by CDET and based on a Microsoft® .NET web services architecture
- The Rustici SCORM engine, providing Sharable Content Object Reference Model (SCORM®) 2004 3rd Edition courseware launching, delivery, and tracking
- Integrated test and survey functionality provided by Questionmark® Perception
- Interactive instructional content and static web-based information resources

Many technical and instructional issues must be considered when developing content for delivery on MarineNet. The evolution of the SCORM® standards coupled with the rigid architecture provided by the Marine Corps Enterprise Network (MCEN) amplifies the critical need for specific standards for content development, packaging, distribution, hosting, and progress tracking. Regulation and maintenance of the MCEN is outside the CDET purview and our DLNOC is not always privy to technical changes that could affect the ability of end user's MCEN computers to view content correctly and communicate with MarineNet.

Developers are assumed to have a thorough understanding of the underlying SCORM® development standards as well as general web technologies and accessibility issues governed by the Department of Defense (DoD) and the United States Marine Corps (USMC). This document is not intended to replace guidance provided by other specification bodies. It is intended to clarify which specific requirements are relevant to MarineNet and must be strictly followed.

1.5 Content Access

1.5.1 MarineNet Garrison Environment

MarineNet garrison environment includes all users on military installations who are accessing content from a MCEN workstation (i.e., behind the USMC MCEN firewall). These firewalls typically block content containing JavaScript, Java and ActiveX typically employed to develop highly interactive multimedia courseware. To provide the most optimal learning engagement, the Digital Content Departement performs robust evaluation and integration activities to ensure content is able to be integrated with LMS interfaces, content distribution, content hosting, client compatibility and network security controls.

1.5.2 MarineNet Internet Environment

Any content delivery request from a computer outside the MCEN is directed to the Internet Information Services (IIS) servers hosted at the DLNOC. Content is delivered to the internet user from these IIS servers via the SCORM® engine. Courseware tracking information is sent back to DLNOC via the SCORM® engine as well. Firewalls may or may not exist between a given internet user and the MarineNet IIS servers. Any such firewalls are outside the control of the MarineNet system, thus their consideration is beyond the scope of USMC contracted courseware development.

2. DESIGN AND DEVELOPMENT GUIDELINES

These technical specifications were developed to govern how content that is developed to be hosted on MarineNet and the learning management systems communicate with each other. The primary benefit of these standards is interoperability.

2.1 Hardware Baseline

The minimum hardware requirements to ensure compatibility with MCEN platforms in workstations and at the LRCs are as follows:

- 1 gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64) processor
- 1 gigabyte (GB) RAM (32-bit) or 2 GB RAM (64-bit)
- 16 GB available hard disk space (32-bit) or 20GB (64-bit)
- DirectX 9 graphics device with Windows Display Driver Model (WDDM) 1.0 or higher driver

2.2 Operating System Baseline

Per current operating system (OS) on MCEN assets, courseware must be compatible with Windows 10. Appendix A lists the establishment and implementation of USMC FY17 client software.

2.3 Software Baseline

Content must be designed to perform at the very least on the Marine Corps Enterprise Network (MCEN) to include the most current hardware and software baseline. For the purposes of this technical specification, the MCEN computers will be used as the baseline for all development efforts. See Appendix A for MCEN configuration specifications. For all new development, the developer is responsible for developing to the current baseline at the time of project start, contract or delivery order award. If circumstances preclude conformance to the software baseline, the government sponsor must request a waiver from CDET.

At a minimum, content submitted to MarineNet must function correctly on the baseline MCEN platform.

Using the incorrect baseline can have significant negative impacts when content is tested for integration with MarineNet and ultimately in delivery to the MarineNet user. Content that fails to comply with the requirements of the baseline development platform may generate one or more Technical Incident Reports (TIRs) when the product is tested for integration with MarineNet and may not run as intended on MCEN

systems. While testing courseware, areas of concern (AOC) may be identified. AOC are areas that did not fail the integration test but were identified as having the potential to cause non-TIR problems.

Users accessing MarineNet via personal computers and the internet increasingly operate varying configurations. Although the established baseline will not cover all possible configurations, the intent is to simplify development in order to reduce development costs and decrease the time to market for new content. Developers are encouraged to maximize cross-platform compatibility to the extent it can be done without compromising the baseline.

2.4 Additional Software of Plugins

No content shall require a user to accept or install ActiveX code, plugins, and/or proprietary players for multimedia or courseware. MCEN places many restrictions on a managed user's computer. Users whose computers are managed by MCEN do not have the necessary permissions to accept or install software or plugins that require Microsoft® Windows registry changes.

2.5 Software Use in Content Development

If a software tool is used to develop content, it should be one typically employed by industry. MarineNet does not endorse any specific software but advises against using internally developed proprietary software that is not publicly available. As part of the intake process, CDET recommends that developers provide the raw files of all content hosted by MarineNet.. In addition, the software must adhere to the following:

- Must not require the use of plug-ins except the ones listed under the MCEN software baseline identified in Appendix A.
- Must not generate underlying code that impairs or impedes course performance, delivery, or functionality in any MarineNet environment.

See Appendix D for MarineNet acceptable file types.

2.6 Browsers

Content developers must ensure that, at a minimum, content will be compatible and run as expected on the following:

- MCEN workstation and browser baseline listed in Appendix A with compatibility "Off"
- Non-MCEN workstation and browser listed in Appendix A with compatibility "Off"

During internal assessment, if sponsors have developed courseware that can also run on other browsers, they can request CDET to review and test content for compatibility as time and priorities permit. After our browser requirement has been met (see Appendix A), CDET could test submitted content in the following browsers:

- Chrome on a non-MCEN MAC platform
- Chrome on a non-MCEN Microsoft® Windows platform

Adhering to the MCEN software baseline ensures content will run in the MarineNet servers and behave as expected on the user's access devices. If the developer does not build content for the browser and version listed in the MCEN baseline, the course may not perform as expected and/or errors may affect the user's experience.

2.7 Server Communication

2.7.1 Server Variables in MarineNet Distributed Environment

The use of server variables in a distributed environment presents several potential problems. This section outlines some of the problems and restrictions for using server variables in the MarineNet distributed environment.

2.7.2 Server Variables and Data Storage

Server-side variables shall only be used to store data that is essential to identifying the user's session and progress within content.

2.7.3 Server-side and Client-side Web Cookies

Content cannot use server-side or client-side Web cookies. MCEN prevents applications from storing cookies on a user's computer.

2.7.4 Server-side Scripts or Technologies

Aside from the approved technologies, MarineNet does not support additional server-side technologies. Attempting to use such technologies will result in multiple errors; the courseware may not function properly and will be rejected during testing. Server-side technologies include, but are not limited to:

- PHP, ASP, CGI, etc.
- Any databases (SQL, coldfusion, access MDB, etc.)
- Server side frameworks such as Ruby or Zend

2.8 Network Connectivity

An important aspect of user experience relies on how fast (or slow) content loads on the user's devices. The reliability and speed at which content is presented to the user's screen depends in great part on the content payload (type and size of content) as well as the network bandwidth. For content loaded to MarineNet, assume that an average user has a network bandwidth of 10 mbps download and 5 mbps upload. When developing and testing content, consider these speeds as the baseline for meeting content load time listed in Table 1 in section 3.4 below.

3. MULTIMEDIA REQUIREMENTS

This section describes absolute requirements for using multimedia files in MarineNet content. Digital products containing Adobe Flash media will no longer be accepted by CDET for hosting on the system. Due to Adobe's plan to remove full support of the Adobe Flash Media player in 2020, all content must be developed with open standard concepts. The following requirements apply to all multimedia file types:

3.1 Acceptable Images

All multimedia content must be optimized for web delivery, to include application of the following guidelines:

- Apply anti-alias to all graphic text.
- Use 72 dpi for static images unless the content is designed specifically for printing.

Multimedia and interactive element file sizes may not exceed 200 MB without a waiver from the CDET Technical Director or the Digital Content Department Head. Within the published limit, file sizes should be kept to the minimum size possible without significantly compromising instructional integrity and flow. Historically, network security actions outside MarineNet control have proven more likely to complicate the delivery of large files.

Multimedia file names cannot use spaces or special characters. Underscores (_); however, are permitted.

3.2 Image Format

Choose an image that best suits the content displayed while also maximizing quality and minimizing file size such as graphic interchange Format (GIF), Joint Photographic Experts Group (JPG), Portable Network graphic (PNG), or scalable vector graphics (SVG).

3.3 Supported Audio and Video Formats

This section describes specific requirements for using audio and video files in MarineNet content. The following audio and video formats have been tested and perform reliably on MarineNet and MCEN:

- Windows Media Audio (WMA)
- Windows Media Video (WMV)
- Moving Picture Experts Group Layer-3 Audio (MP3)

If other file types are used in audio and video content development and do not perform as expected during sponsor review in the MarineNet stage environment, the courseware will be deemed unsupported and will not be submitted for official MarineNet integration testing.

3.4 Acceptable Response Times

The table below lists the average and maximum response times for downloading and displaying/playing content. Maximum response times represent the upper-limit that a user shall wait to view the content. The maximum response time on MCEN assets is shown in figure 1 below for reference.

Type of media	Average response time in development (seconds)	Maximum response time in development (seconds)	Max response on MCEN platform during testing
Static Media	~2	~7	~7
Audio	~5	~8	~8
Video	~6	~10	~10
HTML	~3	~7	~7

Table 1: Acceptable Response Times

4. CONTENT DEVELOPMENT AND PACKAGING

This section specifies the absolute requirements for content development and packaging. As it is required by SCORM 2004 standards, content submitted to MarineNet must include all required SCORM 2004 files in the content package.

4.1 Courseware Reuse and Open Source

The reuse of code and use of open source programming is encouraged where appropriate when developing courseware. However, the reuse of code and use of open source code from another development may not impact the Government ownership of any or all source and compiled code delivered to the Government. Furthermore, the Government does not permit the use or reuse of code that includes restrictions, conditions, or other limitations on ownership, warranty, free distribution or licensing unless such limitations and conditions are explicitly defined and accepted in the Delivery Order or contract for the developed courseware. In such instances, if the conditions or terms of the courseware licensing and/or distribution cited in the delivery order or contract are violated or expire, the product will immediately be removed from MarineNet.

4.2 External Content Requirements

No content packaged for delivery on MarineNet may directly or indirectly rely, in run-time, on any other content or any other external source other than that contained within the content's subdirectory. All content will be self-contained within SCOs.

4.3 Courseware Size

Many rapid development tools and PowerPoint conversion tools used for courseware development will package an entire course as a single electronic file, which can easily and inadvertently exceed allowable file sizes and/or cause unacceptable courseware response times. In some cases, such courseware has completely failed to load. Developers using these tools should consider subdividing content into smaller modules or courses to ensure that the final product functions properly during MarineNet delivery. The recommended maximum total size of a course, to include associated references as applicable, hosted on MarineNet is 750 MB.

4.4 Screen Display Resolution

All MarineNet content should be developed for standard 1024x768 video screen resolutions.

4.5 Embedded Resources

Many MarineNet courses offer additional resources to supplement the training/education or support subsequent job performance. Resource files accessible from within the courseware should be optimized to ensure courseware is within the size limits. Most of these documents are configured as PDF files that may be opened or saved to the learner desktop. Examples of such resources include but are not limited to:

- USMC manual and publication excerpts
- Diagrams
- Charts
- Maps
- Study Aids

4.6 Interactions with the LMS

Critical data should be committed to the LMS at a frequency that balances performance with data integrity. Avoid “chatty” content that continuously communicates bookmarks, session state, or student response between the SCO and the LMS.

4.6.1 Global Variables

The use of global variables in the imsmanifest files is prohibited. To disable global objectives, add or modify the following line. In the <organization> tag set the:

```
adlseq:objectivesGlobalToSystem="false"
```

This setting will ensure that variables used in this SCO will have local scope.

4.6.2 Bookmark Functionality

A user’s progress needs to be saved and the learning experience needs to coincide with the design strategy. Developers must provide CDET the bookmark strategy used in the courseware. The intent is to focus on the user and their learning experience when exiting and relaunching content.

4.6.3 Completion Configuration

All MarineNet-delivered courses must be configured to successfully communicate a status of “completed” to the LMS and must clearly convey completion requirements to the learner. MarineNet learners expect to see a status of “completed” on their individual transcripts after finishing a course.

The value “completed” shall be used to indicate that the user has finished reviewing all the information within a SCO or objective and met any additional completion requirements specified by the courseware sponsor. All such completion requirements must be specifically identified and documented by the courseware sponsor prior to integration testing.

Note: If the course has an associated final assessment developed in Questionmark® Perception, the student will be unable to access the associated assessment until the course is shown as “completed” in the transcript entry. You must complete the courseware before assessment.

If an in-line evaluation is required for the learner to complete the course, the courseware must communicate success and completion statuses to the MarineNet LMS. The courseware should send a numeric score to MarineNet upon each assessment attempt.

4.6.4 MarineNet Certificates

For all tracked items, MarineNet can provide the student with an official certificate upon successful completion of any course or curriculum. The completed certificate (see figure 1) is viewed and printed from the student transcript of completed courses. MarineNet automatically populates certificates with the student name as displayed on the transcript and a unique identification code, offering greatly enhanced student authentication as compared to a typical completion certificate embedded within the e-learning product.



Figure 1: Sample MarineNet Certificate

If a completion certificate is required, developers are encouraged to refer students back to MarineNet rather than providing a certificate within the course. Display the following screen verbiage upon course completion.

Note: Return to your MarineNet transcript of completed courses to view and print the [insert course or curriculum name] completion certificate.

If an inline course certificate is necessary due to alternate distribution methods (e.g., via CD or DVD), developers should take all possible measures to enhance certificate security.

If content/training is intended to be offered offline, a standard MarineNet completion certificate will not be provided.

4.7 Content Launch Window

4.7.1 HTML-5

HTML-5 is the standard framework language for MarineNet courseware. Content not developed with HTML-5 will require CDET staff to adjust launch settings to force the content into an additional browser window.

4.7.2 Additional Windows while Launching Courseware

The following are guidelines for older courseware that does not use HTML-5. In such cases, MarineNet will launch courseware in a separate window.

4.7.2.1 Courseware Launch Window Sizing

In order to maximize available screen space for content and instruction, the MarineNet LMS opens a new window to display all courseware. When a course is launched from MarineNet, the MarineNet courseware window will open. The courseware window contains a MarineNet-generated menu frame, a course-level navigation frame, and a course-content area (see figure 2).

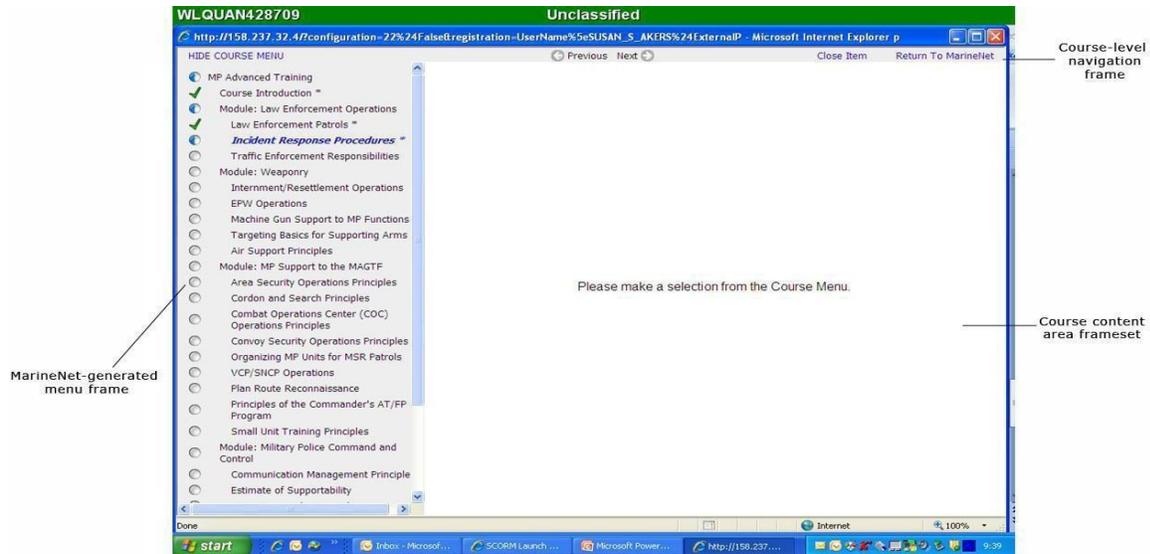


Figure 2: MarineNet Courseware Window

MarineNet generated menu frame. Displays active course-level menu on the left side of the screen. The initial configuration of this menu is a closed state. The learner can display the Course Menu at will; however, active course content launched within the content area while the Course Menu is open may not display properly (see figure 4).

Course-level navigation frame. Allows learner to return to MarineNet and is continually displayed at the top of the courseware screen.

Course content area displays active course content configured to launch in this area. The size of the course content frame is static and has a height of approximately 630 pixels. Developers should keep this in mind when developing content to be displayed in this area

MarineNet can display content via two methods; within a separate window that opens on top of the MarineNet Courseware Window (see Figure 3), which is the default, or within the MarineNet courseware content area (See figure 4). Regardless of the method used, for any multi-SCO course the MarineNet Courseware Window will remain open and accessible to the learner.

4.7.2.2 Content Launched in a Separate Window

MarineNet will launch courseware in a separate window (see figure 3) to avoid conflict between the courseware and the SCORM Engine that may prevent successful communication

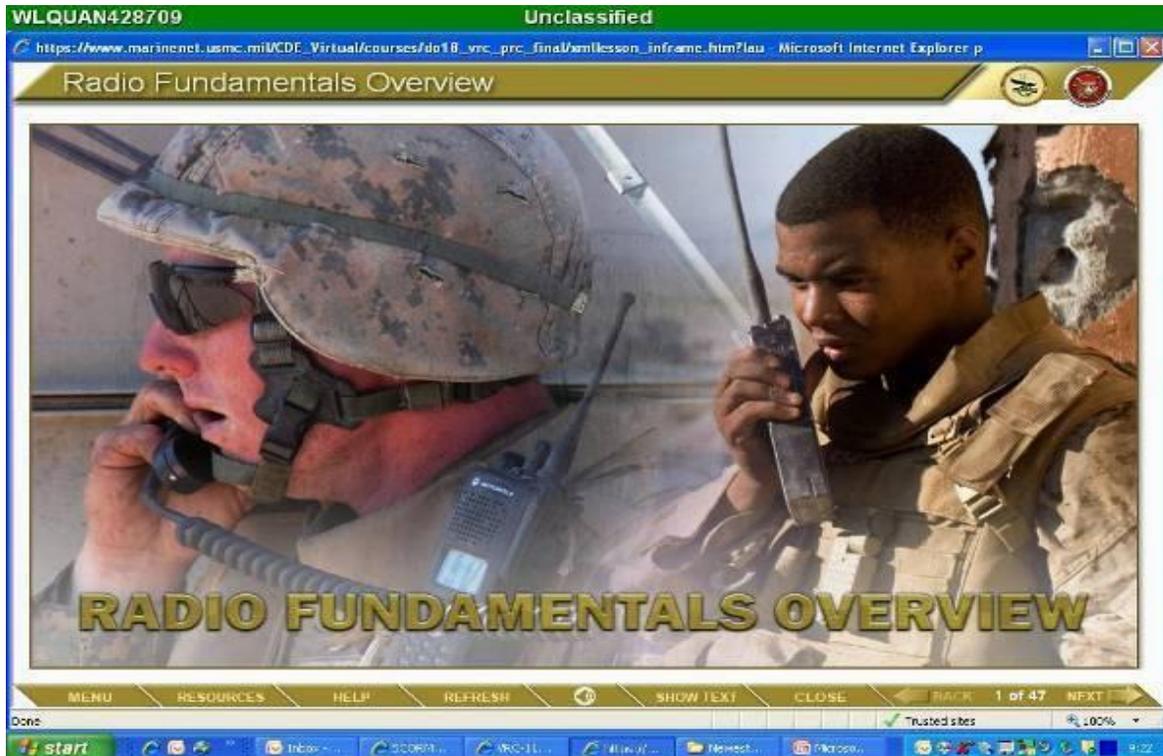


Figure 3: Courseware Launched in Separate Window

4.7.2.3 Content Launched Within the Content Area

Courseware must be specifically configured to use the content area. Courses launched within the content area require only one open browser window and may be easier for the user to manage (see figures 4 & 5). Developers who program for the content area should specify that configuration when submitting the courseware for MarineNet integration testing.



Figure 4: Courseware launched in content area with Course Menu open



Figure 5: Courseware launched in content area with Course Menu closed

Courses with content developed to launch in the content area must also take care when using `document.top`, `document.all`, `parent.XXX` and any other similar relative object addressing within a SCO since they may also reference variables outside the scope of the content area.

Additionally, if the `window.close()` function is called from within the content area, the SCORM engine will inadvertently close and the user will be logged out of the course. A possible solution to this problem is for developers to have learners navigate to a static HTML page that simply instructs the learner to choose another selection from the course menu. This page should automatically appear after the Terminate API function has been called. This can be accomplished by adding `window.location="YOURHTMLPAGE"` right after the terminate function, wherein "YOURHTMLPAGE" is the full path name where the static HTML page is located.

4.8 SCORM Engine

4.8.1 SCORM Manifest and Rollup Rules

If a user exits the course before the course is completed, the desired visual effect is an "in progress" status symbol (half-filled circle) displayed to the left of the course title within the LMS-generated Course Menu. In order to achieve this visual indicator, specific roll-up rules must be included as part of the `imsmanifest.xml` file. These rules are not generated automatically by courseware development tools. Including them will ensure that an undesired red "X" does not appear next to the course title in the Course Menu indicating that the learner has not mastered the content and thus the learner transcript will not display the proper information if the course is exited prior to completion.

The three roll up rules for sequencing are:

```
<imsss:sequencing>
<imsss:controlMode choice="false" flow="true" />
<imsss:rollupRules>
<imsss:rollupRule childActivitySet="all">
<imsss:rollupConditions>
<imsss:rollupCondition condition="completed" />
</imsss:rollupConditions>
<imsss:rollupAction action="satisfied" />
</imsss:rollupRule>
<imsss:rollupRule childActivitySet="all">
<imsss:rollupConditions>
<imsss:rollupCondition condition="completed" />
</imsss:rollupConditions>
<imsss:rollupAction action="completed" />
</imsss:rollupRule>
<imsss:rollupRule childActivitySet="any">
<imsss:rollupConditions>
<imsss:rollupCondition condition="attempted" />
</imsss:rollupConditions>
<imsss:rollupAction action="incomplete" />
</imsss:rollupRule>
</imsss:rollupRules>
</imsss:sequencing>
```

4.8.2 MarineNet SCORM Engine Default Properties

The following images are the default setting for the MarineNet SCORM engine. Changes to these settings should be submitted to the project officer prior to the content being tested on MarineNet.

The screenshot shows the 'Compatibility Settings' window of the MarineNet SCORM engine. The window has a sidebar on the left with the following categories: Navigational Controls, Launch Behavior, Compatibility Settings (selected), Communication Settings, Debugger Options, History Options, and Presets. The main area contains the following settings:

- Finish Causes Immediate Commit
- Logout Causes Player Exit
- Wrap SCO Window with API
- Always Flow to First SCO
- Enable Validation of SCORM Interaction Results
- Raw Score Can Act as Scaled Score
- Rollup Empty Set to Unknown
- Lookahead Sequencer Mode: Enabled (dropdown)
- Use Quick Lookahead Sequencer
- Reset RunTime Data Timing: When Exit Is Not Suspend (dropdown)
- Return To LMS Action: Legacy (dropdown)
- Maximum Suspend Data Size: 4000 (text input)
- SCORM 2004 Edition: SCORM 2004 3rd Edition (dropdown)
- Internet Explorer Compatibility Mode: None (dropdown)
- Disable Root Activity
- Rollup At SCO Unload
- Override Objective and Completion Set By Content to True
- Invoke Rollup at Suspend All
- Satisfaction causes completion
- Make Student Preferences Global to Course

At the bottom left, it says 'Changes Saved' and at the bottom right, there is a 'SAVE' button.

Navigation Controls	Launch Behavior info
Launch Behavior	SCO Launch Type: Frameset
Compatibility Settings	Player Launch Type: Frameset
Communication Settings	New Window Options:
Debugger Options	<input type="radio"/> Full Screen
History Options	<input checked="" type="radio"/> Specify New Window Dimensions
Presets	Width for content: 1010 pixels
	Height for content: 630 pixels
	<input type="checkbox"/> REQUIRED: Above dimensions are required for the course to function properly.
	<input type="checkbox"/> Prevent Window Resize
	<input type="checkbox"/> Available Offline
	Time Limit: 0 (minutes, 0 for no limit)
Changes Saved save	

Navigation Controls	Navigation Controls info
Launch Behavior	<input checked="" type="checkbox"/> Show Navigation Bar
Compatibility Settings	<input checked="" type="checkbox"/> Show Course Structure
Communication Settings	<input checked="" type="checkbox"/> Show Finish Button
Debugger Options	<input checked="" type="checkbox"/> Course Structure Starts Open
History Options	Course Structure Width: 300 pixels
Presets	Structure Status Display: Combined
	Invalid Menu Item Action: Show but Disable Links
	<input type="checkbox"/> Show Close SCO Button
	<input type="checkbox"/> Show Progress Bar
	<input type="checkbox"/> Use Measure For Progress Bar
	<input checked="" type="checkbox"/> Show Help
	<input checked="" type="checkbox"/> Show Title Bar
	<input type="checkbox"/> Prevent Right Click
Changes Saved save	

4.8.3 SCORM Errors

During courseware development, developers may encounter a variety of SCORM errors. This section lists some examples of common SCORM errors. The list is not comprehensive. See the ADL website at <http://www.adlnet.org> for detailed documentation on SCORM and relevant errors.

Common SCORM errors include

- General Commit Failure
- Store Data/Retrieve Data/Commit/Termination before initialization
- Store Data/Retrieve Data/Commit/Termination After Termination
- Undefined data model element
- Already initialized
- Content instance terminated
- Data model element type mismatched
- General exception

Courseware containing SCORM errors will not function properly inside the LMS. Courseware found to contain errors will be rejected.

4.8.4 Courseware Completion Issue

It has been noted during courseware testing that some courses have SCOs marked with a completion status of “Completed” and a success status of “Passed” either before they are completed, or sometimes without having viewed the content. These behaviors are in accordance with SCORM standards. By default, if a SCO is accessed by the user and no completion or success status is sent to the LMS, then the SCO will be automatically completed/passed.

A solution to this issue is to have the developer program the course in such a way as to update the completion and success statuses. Due to the numerous methods available, it is impossible to capture every instance of how a developer could set the completed/passed statuses on the LMS; however, the two methods of avoiding the premature completion issues detailed below have been tested on the MarineNet server. Essentially, developers need to set the completion and success statuses. Follow the steps below to set completion and success statuses:

Step	Action
1	Set the completion status to —incomplete immediately upon entering a SCO for the first time, and communicate this status to the LMS.
2	Configure each SCO in the imsmanifest.xml file to require a completion and success status from the course, per the details below.

Any SCOs that are meant to complete based on a user’s action (e.g., viewing all content, passing quizzes) must turn off this feature. This is done by setting properties of the <imsss:deliveryControls> in the imsmanifest.xml file for each SCO as seen in the following example:

Please note that the references to “LESSON1”, “RESOURCE LESSON1” and “Lesson 1 – Interface” included in the example are placeholders and should be updated to reflect the proper course construct.

```
<item identifier="LESSON1" identifierref="RESOURCE_LESSON1">
<title>Lesson 1 – Interface</title>
<imsss:sequencing>
<imsss:deliveryControls
completionSetByContent="true" objectiveSetByContent="true" />
</imsss:sequencing>
</item>
```

Each SCO should contain the above code in the content organization section of the imsmanifest.xml file, within the SCO’s <item> tag.

CompletionSetByContent="true" specifies that the SCO will only update the completion status with statuses sent by the SCO’s content.

ObjectiveSetByContent="true" specifies that the SCO will only update the success status with statuses sent by the SCO's content. Below are correct and incorrect examples of the imsmanifest.xml file, with the appropriate areas highlighted for emphasis. Both examples are based on the <organizations> section from the imsmanifest.xml file of the Combating Trafficking in Persons course, a course currently available on MarineNet.

4.8.5 Correct IMSMANIFEST

XML – The delivery controls are defined within each <item>.

```
<organizations default="ORG-4976">
<organization identifier="ORG-4976" structure="hierarchical">
<title>Combating Trafficking in Persons Leadership Training</title>
<item identifier="ITEM-B9FC" identifierref="RES-814D">
<title>Module 1: Review from General Awareness</title>
<imsss:sequencing>
<imsss:deliveryControls completionSetByContent="true" objectiveSetByContent="true" />
</imsss:sequencing>
</item>
<item identifier="ITEM-0A7F" identifierref="RES-FFAD">
<title>Module 2: Operating Procedures</title>
<imsss:sequencing>
<imsss:deliveryControls completionSetByContent="true" objectiveSetByContent="true" />
</imsss:sequencing>
</item>
<item identifier="ITEM-4AB5" identifierref="RES-F6F7" isvisible="true">
<title>Module 3: Stories from the Field</title>
<imsss:sequencing>
<imsss:deliveryControls completionSetByContent="true" objectiveSetByContent="true" />
</imsss:sequencing>
</item>
<item identifier="ITEM-DF79" identifierref="RES-3D86">
<title>Certificate of Completion</title>
<imsss:sequencing>
<imsss:deliveryControls completionSetByContent="true" objectiveSetByContent="true" />
</imsss:sequencing>
</item>
</organization>
</organizations>
```

4.8.6 Incorrect IMSMANIFEST

XML – The delivery controls is defined in the wrong place.

```
<organizations default="ORG-4976">
<organization identifier="ORG-4976" structure="hierarchical">
<title>Combating Trafficking in Persons Leadership Training</title>
<item identifier="ITEM-B9FC" identifierref="RES-814D">
<title>Module 1: Review from General Awareness</title>
</item>
<item identifier="ITEM-0A7F" identifierref="RES-FFAD">
<title>Module 2: Operating Procedures</title>
</item>
<item identifier="ITEM-4AB5" identifierref="RES-F6F7" isvisible="true">
<title>Module 3: Stories from the Field</title>
</item>
<item identifier="ITEM-DF79" identifierref="RES-3D86">
<title>Certificate of Completion</title>
</item>
<imsss:sequencing>
<imsss:deliveryControlscompletionSetByContent="true" objectiveSetByContent="true" />
</imsss:sequencing>
</organization>
</organizations>
```

5. QUESTIONMARK® EOC EXAMS AND SURVEYS

MarineNet currently uses Questionmark® Perception (QMP) Server version 5.7 with Service Pack 1 (update is planned) to deliver all pre-tests, End-of-Course (EOC) exams, and surveys not incorporated within the courseware. QMP authoring software should be used to create all such EOC evaluations. The following overarching requirements and constraints apply:

- By Government sponsor request to CDET Operations, Courseware development contractors may be allowed use of Questionmark® Live under the USMC license. Use and duration will be constrained to the specific USMC project.
- Contractors are responsible for their own QMP training. CDET can be used as a resource to provide limited documentation for MarineNet-specific procedures only.
- Each exam or survey must be exported and provided as a Qpack, a Questionmark® proprietary format that contains all of the assets within that exam or survey.
- Due to specific MarineNet implementation for improved assessment security, developers may not make use of the introductory text option in an assessment. If an introduction is needed, developers must create a separate question block to present that information.
- MarineNet uses the qxqMarineNet2 template for assessments and surveys and the qxqMarineNet_intro2 template for introduction blocks. Both aforementioned templates can be provided upon request by DCD.
- The use of special fields to store question answers or outcomes is limited in the MarineNet instance of Questionmark®. Six of the 10 special fields (S1-S6) are reserved for communication from the MarineNet LMS. Special fields S7-S10 are open for developer use. If multimedia files are included in questions or responses, developers must identify and include in the exported Qpack file all related source files. The following QMP question types are prohibited from use in any courseware developed for MarineNet:
 - Essay
 - Spoken Response
 - File Upload

The use of text match, while technically supported, is discouraged due to the difficulty in anticipating and programming for common misspellings, etc.

6. SECTION 508 COMPLIANCE

Section 508 of the Rehabilitation Act of 1996 requires all Federal agency electronic and information technology to be accessible to people with disabilities, including employees and members of the public. Specific information on Section 508 may be found at <http://www.section508.gov>. The degree of compliance may vary based on content type per Section 508, Subpart A, 1194.3 (a). Developers shall consult their Government sponsor for specific compliance requirements. Government sponsors are responsible for verification that requirements have been met. MarineNet integration testing does not include specific evaluation for Section 508 compliance.

APPENDIX A: COURSEWARE SOFTWARE ENVIRONMENT

ESTABLISHMENT AND IMPLEMENTATION OF USMC FY17 CLIENT SOFTWARE

Originator:	CMC C FOUR CP WASHINGTON DC//CP ESPM//
DTG:	311921Z Aug 16 Precedence: R DAC: General
To:	COMMARCORSYSCOM ISI QUANTICO VA, MARFORCYBERCOM FT MEADE MD, CMC C FOUR CIO WASHINGTON DC, CMC C FOUR CP WASHINGTON DC, More...
CC:	CG I MEF G SIX, CG II MEF FWD G SIX, CG III MEF G SIX, COMMCICOM G SIX, More...

RAAUZYUW RUJIAAA0113 2441931-UUUU--RUJIAAA.
ZNR UUUUU ZDH ZUI RUEOMCH0409 2441931
R 311921Z AUG 16
FM CMC C FOUR CP WASHINGTON DC//CP ESPM//
TO RUJIAAA/COMMARCORSYSCOM ISI QUANTICO VA
RUJIAAA/MARFORCYBERCOM FT MEADE MD
RUJIAAA/CMC C FOUR CIO WASHINGTON DC
RUJIAAA/CMC C FOUR CP WASHINGTON DC
RUJIAAA/CMC C FOUR CR WASHINGTON DC
RUJIAAA/CMC C FOUR CS WASHINGTON DC
RUJIAAA/CMC C FOUR CY WASHINGTON DC
RUJIAAA/CMC C FOUR WASHINGTON DC
RUJDAAA/CG I MEF
RUJIAAA/CG II MEF
RUJDAAA/CG III MEF
RUJIAAA/COMMCICOM
RUJIAAA/COMMARFORSOC
RUJIAAA/CG MCIEAST MCB CAMLEJ
RUJDAAA/CG MCIPAC
RUJDAAA/CG MCIWEST MCB CAMPEN
RUJIAAA/MCINCR MCBQ G SIX
INFO RUJDAAA/CG I MEF G SIX
RUJIAAA/CG II MEF FWD G SIX
RUJDAAA/CG III MEF G SIX
RUJIAAA/COMMCICOM G SIX
RUJIAAA/COMMARFORCOM G SIX
RUJIAAA/COMMARFOREUR
RUJDAAA/COMMARFORJ
RUJDAAA/COMMARFORPAC
RUJIAAA/COMMARFORRES
RUJIAAA/COMMARFORRES G SIX
RUJIAAA/COMMARFORSOC G SIX
RUJIAAA/CGMCIEAST MCB CAMLEJ G SIX
RUJDAAA/CG MCIPAC G SIX
RUJDAAA/CGMCIWEST MCB G SIX
RUJDAAA/CO MCB G SIX KANEOHE BAY HI RUJDAAA/COMMARFORPAC G
SIX
BT
UNCLAS

SUBJ/ESTABLISHMENT AND IMPLEMENTATION OF USMC FY17 CLIENT SOFTWARE BASELINE AND SPECIALTY SOFTWARE LIST REF/A/MEMO/DON CIO/YMD:20021018// REF/B/DOC/CMC/YMD:20100105// REF/C/MCO/DMCS/YMD:20121003// REF/D/MSG/HQMC C4/YMD:20060623// REF/E/MEMO/DON CIO/YMD:20120222// REF/F/GENADMIN R 291719Z SEP 14 REF/G/MARADMIN 375-11/DMCS/YMD:20110706// REF/H/MSG/TRANSMMSG 016-13/HQMC C4/YMD:20130621// REF/I/MARADMIN 304-15/HQMC C4/YMD:20140811// NARR/REF (A) IS THE DON APPLICATION AND DATABASE MANAGEMENT SYSTEM (DADMS) CHARTER, WHICH DESIGNATES DEPARTMENT OF THE NAVY (DON) APPLICATION AND DATABASE MANAGEMENT SYSTEM (DADMS) AS THE AUTHORITATIVE DATASOURCE FOR APPLICATIONS AND SOFTWARE USED THROUGHOUT THE DON. REF (B) IS MCO 5400.52, WHICH ASSIGNS DIRECTOR C4 THE ROLES AND RESPONSIBILITIES OF THE (DON) DEPUTY CIO FOR THE MARINE CORPS (DDCIO (MC)). REF (C) ESTABLISHES USMC INFORMATION TECHNOLOGY (IT) PORTFOLIO MANAGEMENT (PFM) ROLES AND RESPONSIBILITIES. REF (D) IS MARADMIN 287/06, DOD IT PORTFOLIO REPOSITORY (DITPR)-DON USMC ROLES, RESPONSIBILITIES, AND PROCESSES. REF (E) IS DON CIO DIRECTIVE ANNOUNCING MANDATORY USE OF (DON) ENTERPRISE LICENSE AGREEMENTS (ELA) BY ALL DON ORGANIZATIONS AND PROGRAMS TO ACHIEVE MAXIMUM COST SAVINGS. REF (F) ESTABLISHED THE CORE AND SPECIALTY SOFTWARE LIST FOR FY16. REF (G) OUTLINES THE IT PROCUREMENT REQUEST AND APPROVAL PROCESS. REF (H) PROVIDED INITIAL GUIDANCE ON LICENSE TRANSFER FROM HP UNDER CLIN 23 OF THE NMCI/COSC CONTRACT WHEN THE MARINE CORPS TRANSITIONED IN FY13 TO THE GOVERNMENT OWN/GOVERNMENT OPERATED MODEL. REF (I) OUTLINES THE APPROVED OPERATING SYSTEMS ON THE MCEN AND PROVIDES THE WAY FORWARD ON SYSTEM DEVELOPMENT.//

POC/TREVOR DANIEL/CIV/UNIT: HQMC C4CP/NAME: WASHINGTON DC /TEL: 571-256-9082/EMAIL: TREVOR.DANIEL(AT)USMC.MIL

POC/HANK COSTA/CIV/UNIT: HQMC C4CP/NAME: WASHINGTON DC /TEL: 571-256-9081/EMAIL: HENRY.COSTA(AT)USMC.MIL//

GENTEXT/REMARKS/1. THIS MESSAGE ESTABLISHES THE CLIENT SOFTWARE BASELINE AND SPECIALTY SOFTWARE LIST FOR FISCAL YEAR 2017. THE MARINE CORPS CLIENT SOFTWARE BASELINE AND SPECIALTY SOFTWARE LIST IS A COORDINATED EFFORT BETWEEN HEADQUARTERS MARINE CORPS COMMAND, CONTROL, COMMUNICATIONS AND COMPUTERS (C4) DEPARTMENT, MARINE CORPS SYSTEMS COMMAND (MCSC), AND MARINE CORPS FORCES CYBER COMMAND (MARFORCYBER). THIS MESSAGE SUPERSEDES REF F.

2. PURPOSE. TO PROVIDE AWARENESS TO END-USERS, PROGRAM MANAGERS (PMS), FUNCTIONAL AREA MANAGERS (FAMS), AND COMMANDERS, ON THE CORE AND ENTERPRISE SERVICES SPECIALTY SOFTWARE LISTS FOR FY17, IN ACCORDANCE WITH REFS (A) THROUGH (I).

3. THE INTENT OF THIS ANNUAL MESSAGE IS TO CONTINUE TO RATIONALIZE THE USMC SOFTWARE PORTFOLIO, CAPTURE EFFICIENCIES THROUGH THE USE OF ENTERPRISE LICENSE AGREEMENTS (ELAS) (WHERE APPLICABLE), AND REDUCE GOVERNMENT OFF THE SHELF SOFTWARE (GOTS), IN ACCORDANCE WITH REFS

(D) AND (F), AS WELL AS PROVIDE

AN OUTLINE FOR ENTERPRISE SOFTWARE LICENSE AND ASSET MANAGEMENT. THE SOFTWARE CONTAINED IN THESE LISTS IS EITHER PART OF THE MARINE CORPS ENTERPRISE DESKTOP STANDARDIZATION (MCEDS) IMAGE OR HAS

BEEN RATIONALIZED AND APPROVED AS AN ENTERPRISE WIDE SOLUTION FOR

ACHIEVING A PARTICULAR INFORMATION TECHNOLOGY CAPABILITY. THE CLIENT SOFTWARE BASELINE AND SPECIALTY SOFTWARE LIST CONSISTS OF JOINT SERVICE, DEPARTMENT OF NAVY, AND MARINE CORPS ENTERPRISE-WIDE APPLICATIONS THAT ARE REGISTERED IN DADMS AND MANAGED BY THE FAM(S), IN ACCORDANCE WITH REF (C).

4. THE FOLLOWING APPLICATIONS ARE CORE CLIENT APPLICATIONS. ALL NEW COMPUTERS OR REIMAGED MACHINES ADDED TO THE USMC ENTERPRISE MUST HAVE THE APPROVED CORE SOFTWARE BASELINE PRESCRIBED BY THE MCEDS IMAGE BELOW.

FY17 CORE SOFTWARE BASELINE:

90 METER SMART CARD MANAGER V1.2.X (SIPR MACHINES ONLY)

ACTIVITY ACTIVITY CLIENT V7.0.X (NIPR MACHINES ONLY) ADOBE

READER DC V15.10.X

ADOBE SHOCKWAVE PLAYER 12.2.X ATHOC

DESKTOP NOTIFIER 6.2.X

AXWAY TUMBLEWEED DESKTOP VALIDATOR 4.12 SP3 CITRIX

RECEIVER 4.4.X

MCAFEE AGENT WIN CLIENT 5.0.X MCAFEE

ACCM 3.0.X

MCAFEE DATA LOSS PREVENTION (DLP) ENDPOINT 9.4.X MCAFEE

HOST INTRUSTION PROTECTION 8.X

MCAFEE POLICY AUDITOR 6.2.X

MCAFEE VIRUSSCAN ENTERPRISE CLIENT V8.8.X

MICRO FOCUS REFLECTIONS 16.0.X

MICROSOFT EDGE

MICROSOFT .NET 3.5.X FRAMEWORK

MICROSOFT .NET 4.6 FRAMEWORK

MICROSOFT BITLOCKER MICROSOFT

DIRECTX 11.X

MICROSOFT ENHANCED MITIGATION EXPERIENCE TOOLKIT (EMET) V5.X

MICROSOFT INTERNET EXPLORER 11

MICROSOFT NETBANNER 2.3.X

MICROSOFT OFFICE PROFESSIONAL PLUS 2013

MICROSOFT SILVERLIGHT 5.1.X MICROSOFT

SMIME FOR OWA 14.X

MICROSOFT SYSTEM CENTER CONFIGURATION MANAGER (SCCM) CLIENT 2012

MICROSOFT VISUAL C++ 2005 REDISTRIBUTABLE X86 AND X64 8.0

MICROSOFT VISUAL C++ 2008 REDISTRIBUTABLE X86 AND X64 9.0 MICROSOFT

VISUAL C++ 2010 REDISTRIBUTABLE X86 AND X64 10.0 MICROSOFT VISUAL C++

2012 REDISTRIBUTABLE X86 AND X64 11.0 MICROSOFT VISUAL C++ 2013

REDISTRIBUTABLE X86 AND X64 12.0 MICROSOFT WINDOWS 10 ENTERPRISE

ORACLE JAVA RUNTIME ENVIRONMENT 8.0.X PULSE

SECURE VERSION IS 8.1.5.X QUESTIONMARK SECURE

BROWSER 5.3.0.4 TRIDENT SYSTEMS TRANSVERSE

1.8.X

SOFTWARE LISTED AS CORE SOFTWARE IS PART OF THE MCEDS IMAGE AND IS UPDATED FREQUENTLY. AS SUCH, VERSIONS ARE SUBJECT TO CHANGE. CURRENT APPROVED VERSIONS WILL BE PUSHED VIA PATCH UPDATES OR MANUAL INSTALL. THE LATEST APPROVED VERSIONS FOR USE IN THE MARINE CORPS CAN BE FOUND IN DADMS, OR BY CONTACTING THE ENTERPRISE SERVICES FAM. THE ABOVE

LISTED SOFTWARE REPRESENTS THE MARINE CORPS' WAY-AHEAD IN THE

IMPLEMENTATION OF DOD CIO GUIDANCE TO MOVE TO WINDOWS 10 AS THE APPROVED OPERATING SYSTEM ON THE MCEN. MARINE CORPS PROGRAMS OF RECORD UNABLE TO MAKE THE MOVE TO WINDOWS 10 PRIOR TO 31 JANUARY 2017 MUST OBTAIN A WAIVER SIGNED BY DIRECTOR C4 TO CONTINUE USE OF LEGACY OPERATING SYSTEMS. WAIVERS BEYOND 31 JANUARY 2018 WILL REQUIRE APPROVAL FROM NOT ONLY DIRECTOR, C4 BUT ALSO DOD CIO.

5. THE CLIENT SOFTWARE BASELINE AND SPECIALTY SOFTWARE LIST (WHICH INCLUDES FORMER CLIN 23 ITEMS UNDER NMCI/COSC) IDENTIFIES SELECTIVE APPLICATIONS THAT ARE USED ENTERPRISE WIDE, HAVE LIMITED USERS, AND SATISFY UNIQUE CAPABILITIES. THE LIST OF SPECIALTY SOFTWARE IDENTIFIED BELOW SUPPORTS ENTERPRISE SERVICES.

FY17 APPROVED SPECIALTY SOFTWARE:

ADOBE ACROBAT PRO
ADOBE CREATIVE SUITE STD
ADOBE DREAMWEAVER
ADOBE FRAMEMAKER ADOBE
ILLUSTRATOR ADOBE
INDESIGN
ADOBE PHOTOSHOP ADOBE
PREMIERE PRO
ATTACHMATE REFLECTION X 14.1 SP2
AUTODESK AUTOCAD LT
AUTODESK AUTOCAD
APPLIGENT REDAX
MICROSOFT PROJECT PROFESSIONAL
MICROSOFT PROJECT STANDARD
MICROSOFT VISIO

FOR A COMPLETE LIST OF SOFTWARE THAT SUPPORTS ENTERPRISE SERVICES OR ANOTHER FUNCTIONAL AREA, USERS SHOULD COORDINATE THROUGH DADMS AND WITH THEIR RESPECTIVE FAM(S). CORE AND SPECIALTY SOFTWARE (EXCLUDING USER-BASED MICROSOFT CALS ONLY) MUST BE INSTALLED TO A DEVICE, RATHER THAN ASSIGNED TO A USER IN ORDER TO REMAIN IN COMPLIANCE WITH STRICT LICENSING GUIDELINES SET FORTH BY THE VENDOR AND AGREED TO BY THE MARINE CORPS. FOR THE PURPOSES OF IT SERVICE MANAGEMENT, APPLICATION LICENSES AND ASSET MANAGEMENT WILL BE MANAGED BY THE MARINE CORPS INSTANCE OF BMC REMEDY.

TOTAL OWNERSHIP (COST OF LICENSE, MAINTENANCE AND RENEWAL) OF THESE SPECIALTY APPLICATIONS SHALL BE THE RESPONSIBILITY OF THE USING COMMAND. CURRENT LICENSES THAT WERE PURCHASED UNDER COSC, AND MANAGED BY PRODUCT MANAGERS (PDM), MARINE CORPS NETWORK AND INFRASTRUCTURE SERVICES(MCNIS), HAVE TRANSFERED OWNERSHIP AND MAY REMAIN ON EXISTING ASSETS PROVIDED FUNDING IS IDENTIFIED ACROSS THE FYDP FOR THE SOFTWARE BY EACH COMMAND IN ACCORDANCE WITH REF (J). CONTINUING IN FY17, AND TO BE PLANNED FOR THROUGH THE FYDP UNTIL OFFICIALLY NOTIFIED BY HQMC C4, COMMANDS WILL BE RESPONSIBLE FOR COVERING THE COST OF ADDITIONAL LICENSE PURCHASE AND MAINTENANCE OF SPECIALTY SOFTWARE AND THE FORMER CLIN-23 SOFTWARE TRANSFERRED FROM HP. COORDINATED FUNDING INSTRUCTIONS WILL BE PROMULGATED BASED ON INDIVIDUAL LICENSE AGREEMENTS FINANCIAL TERMS.

IN ACCORDANCE WITH REF (G), PURCHASE OF NEW SOFTWARE LICENSES NEEDS TO BE COORDINATED WITH CORRESPONDING AC/S G-6 AND G-8 STAFFS, FOLLOWING THE ITPRAS PROCESS, WITH FUNDING IDENTIFIED FOR THE INITIAL LICENSE PURCHASE AS WELL AS MAINTENANCE ACROSS THE FYDP. WHEN AVAILABLE, COMMANDS ARE REQUIRED TO PURCHASE LICENSES THROUGH EXISTING ENTERPRISE LICENSE AGREEMENTS (ELAS) MANAGED BY PM MCELMS. THIS INCLUDES THE PROCUREMENT OF SOFTWARE ON BEHALF OF A PROGRAM OF RECORD EITHER THROUGH OTHER DOD OR DON ORGANIZATIONS SUCH AS SPAWAR, OR THROUGH AN INDUSTRY PARTNER UNDER CONTRACT AS PART OF A PDSS CONTRACT. IN CASES WHERE MCELMS IS UNABLE TO COMPLETE THE PROCUREMENT, COMMANDS SHOULD USE DON ESL'S OR DOD ENTERPRISE SOFTWARE INITIATIVE (ESI). ALL PROCUREMENTS SHOULD BE COORDINATED WITH THE ASSOCIATED AC/S G-6 AND G-8 STAFFS.

6. RELEASE APPROVED BY BGEN. DENNIS CRALL, DIRECTOR C4/DEPUTY DON CIO (MC).

APPENDIX B: MARINET NET FUNCTIONALITY REVIEW CHECKLIST

Stage or RTE Course Code:	Course Name:
Reviewer's Stage Account Name:	MCEN Computer Name:
Windows OS Version:	Internet Explorer Browser Version:
Reviewer's Telephone Number:	Reviewer's Email:
Sponsoring Agency:	Date Review Was Completed:

As the USMC sponsor for this distance learning product, your thorough, screen-by- screen product review is crucial to MarineNet's (MNET) delivery of effective training and education. In order to ensure full functionality in the most restrictive online environment, you must access MarineNet Stage via standard USMC workstation on the MCEN network, preferably with your monitor display resolution set to 1024x768.

CDET will use your completed and signed checklist to determine readiness for formal MarineNet Integration Testing. MNET Integration Testing procedures focus on successful product-system delivery and communication, but do not assess screen-by-screen functionality nor content.

NOTE ABOUT INTERNET EXPLORER COMPATIBILITY MODE: Most MCEN workstations use Windows 7 and Internet Explorer (IE) Version 11. This IE version differs significantly in the way it interprets courseware code, and in some courses, may cause display or functionality errors. If you experience problems, try setting IE to "Compatibility View" via the Tools menu; conversely, if you are already using Compatibility View, you may need to deselect that setting. Be sure to annotate all errors you experienced in either IE mode, and tell us whether or not each was corrected by switching IE to the opposite mode.

Directions:

- 1) **FIRST and FOREMOST:** Consult with your developer to ensure you understand exactly what you should look for and experience during your product review, including but not limited to exactly what you need to do to successfully complete the learning product. If a pre-test or end-of-course assessment is developed, make sure you understand whether it is programmed into the courseware or provided separately as a "Q-pack." (If the latter, you will not be able to access the end-of-course test until all instructional materials are complete.)

- 2) Complete the reviewer's and sponsoring agency's information at the top of this form. The first two blocks ask for a Stage or RTE Course Code and Course Number.

- 3) Locate and record the MCEN computer name for the workstation from which you will conduct the Stage Review. You can find the computer name on the “Unclassified” banner or with the My Computer icon on your desktop.
- 4) Please familiarize yourself with the checklist criteria, then proceed through the instructional content and the test (if applicable) in the role of a student who
 - a. Needs to master the instructed knowledge and skills in order to perform his/her job
 - b. Is required to pass the course.
- 5) Using the username and password provided, log into the directed stage environment:
<https://stage1.marinenet.usmc.mil/MarineNet/Home.aspx> or
<https://stage3.marinenet.usmc.mil/MarineNet/Home.aspx>
- 6) Enter the provided course code in the Search box.
- 7) Enroll, launch the course, and proceed with your review.
- 8) Place an “X” in the Yes or the No columns to answer questions in this checklist. If your response is “No,” please explain the problem. If the problem is confined to a particular screen, please note the module/lesson/topic title and screen identifier (typically a “page number”) for each instance of the problem.
- 9) Record the completion date for your review.
- 10) If your course is intended to run on any other platform combinations besides the MCEN Windows/IE11 (e.g. non-MCEN Windows/Chrome or Mac Chrome), then a review is expected within those environments as well. Consolidate all comments into this one checklist, but annotate which platform combination the comment pertains.

Review Criterion	Yes	No	If No, explain:
1. Pre-test Functionality	YES	NO	
<p>1.1 Some courses have pre-test functionality embedded that allow users to take a pre-test, which if passed, allow them to bypass the course itself and get the completion certificate. Users only have one opportunity to pass the pre-test and bypass the course. Note: If courseware being tested DOES NOT have a pre-test, then go to step 2. "Launch and Exit Behavior" below.</p>			
1.2 Is Pre-Test available?	<input type="checkbox"/>	<input type="checkbox"/>	
1.2.1 If the course has a pre-test, is the user presented with CLEAR instructions and information?	<input type="checkbox"/>	<input type="checkbox"/>	
1.2.2 If the course has a pre-test, is the user allowed to select and launch the pre- test?	<input type="checkbox"/>	<input type="checkbox"/>	
1.3 Fail the Pre-Test. If the user fails the pre-test, it should not be available until the next cycle/period. Elect to take the pre-test and answer the questions incorrectly in order to fail the pre-test.			
1.3.1 After failing the pre-test, log back into the courseware again. Is the pre-test option still available?	<input type="checkbox"/>	<input type="checkbox"/>	
1.4 If the user fails the pre-test, it should not be available until the next cycle/period. This behavior should apply even if users disenroll and reenroll. At this point, go ahead and disenroll then reenroll.			
1.4.1 After disenrolling/reenrolling, log back into the courseware again. Is the pre-test option still available?	<input type="checkbox"/>	<input type="checkbox"/>	

1.5 Passing the pre-test. In order to proceed to the next step, contact the PO to reset the pre-test option in the system. After the pre-test is available again, take the pre-test and pass it.			
1.5.1 After the user has passed the pre- test, does the system register this course as “Completed” in the MarineNet transcript page?	<input type="checkbox"/>	<input type="checkbox"/>	
1.6 Before continuing with the checklist and going through the normal courseware content, dis-enroll and reenroll in the courseware.			
2. Launch and Exit Behavior	YES	NO	
2.1 Launch the course for the first time. Note: Contact the PO to reset the courseware if there was a Pre- Test functionality and step 1.6 above was not sufficient to continue testing.			
2.1.1 Does the course open to the expected screen?	<input type="checkbox"/>	<input type="checkbox"/>	
2.1.2 Exit the course prior to completion. Does the course offer a way to exit OTHER THAN closing the browser window using the X at top right corner? Note: You will typically see a link or button labeled “Exit” or “X” within the course interface.	<input type="checkbox"/>	<input type="checkbox"/>	
2.1.3 Exit the course prior to completion. Does your MarineNet My Active Enrollments page display “Enrolled” in the Status column?	<input type="checkbox"/>	<input type="checkbox"/>	
3. Bookmarking (If applicable)	YES	NO	
3.1 Normal course exit.			
3.1.1 Re-launch the course after a normal course exit. Does the course re-open at your last “bookmark” in the course, (the last screen you viewed before the normal course exit) or as otherwise required? (Consult with your developer for exact bookmark functionality.)	<input type="checkbox"/>	<input type="checkbox"/>	

<p>3.1.2 Unusual Shutdown Check. Shut down the course via the task manager (hard shutdown) and then launch the course again from the MarineNet website. Does the course re-open at your last “bookmark” in the course - the last screen you viewed before the hard shutdown? (Consult with your developer for exact bookmark functionality)</p>	<input type="checkbox"/>	<input type="checkbox"/>	
<p>4. MarineNet Course Menu (This is applicable only to multi-SCO courses.) MarineNet Course Menu is the one displayed on the first window after launch—look for items listed on a gray background with HIDE/SHOW COURSE MENU.</p>	YES	NO	
<p>4.1 As you proceed through the course, pay attention to the MarineNet Course Menu. You should see empty circles fill in and/or change to green checks as you complete course requirements.</p>			
<p>4.1.1 Does the course menu correctly record and display your progress through the course?</p>	<input type="checkbox"/>	<input type="checkbox"/>	
<p>5. Internal Course Menu (If applicable)</p>	YES	NO	
<p>5.1 Open the course’s internal menu/table of contents and try each hyperlink.</p>			
<p>5.1.1 Does each menu/table of contents item shows the appropriate course segment?</p>	<input type="checkbox"/>	<input type="checkbox"/>	
<p>5.1.2 If intended to do so, does the course’s internal menu/table of contents indicate visited segments and/or progress through course segments?</p>	<input type="checkbox"/>	<input type="checkbox"/>	
<p>5.1.3 If the course does not have a formal menu, does it offer another way to move from segment to segment without moving forward and backward through every screen?</p>	<input type="checkbox"/>	<input type="checkbox"/>	
<p>6. Screen Load Time</p>	YES	NO	
<p>6.1 As you move through the course, pay attention to the time required to load</p>			

content to each new screen.			
6.1.1 Does every screen load content in less than 5 seconds? If “No,” briefly describe the screen/page content (i.e., only text, page loaded with pictures, 10-minute video, etc.) for all screens/pages that failed to load within 5 seconds?	<input type="checkbox"/>	<input type="checkbox"/>	
7. Navigation	YES	NO	
7.1 Move forward and backward among screens.			
7.1.1 Does the course provide a consistent and intuitive navigation functionality to move through the content?	<input type="checkbox"/>	<input type="checkbox"/>	
7.1.2 Does the navigation function correctly?	<input type="checkbox"/>	<input type="checkbox"/>	
7.2 Keep aware of where you are in the course (if applicable).			
7.2.1 Does the course consistently and accurately display your position within the course (via screen counter, progress bar, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>	
8. Other User Interface Elements (If applicable):	YES	NO	
8.1 From various screens within each course segment, try all available user interface elements (e.g., resources, glossary, etc.).			
8.1.1 Do all user interface elements function correctly throughout the course?	<input type="checkbox"/>	<input type="checkbox"/>	
8.1.2 Can you successfully print all printable files provided within the course?	<input type="checkbox"/>	<input type="checkbox"/>	
8.2 As you move through the course, pay attention to the availability of self-help, clear instructions to complete the course, and the quality of directions to the learner.			
8.2.1 Is such learner support sufficient to allow the learner to successfully complete the course utilizing only information, guidance, and directions contained within the course (i.e., without additional	<input type="checkbox"/>	<input type="checkbox"/>	

explanation or outside assistance)?			
8.3 Click on every hyperlink (text or image link) within the course content.			
8.3.1 Do all hyperlinks take you to the intended location or open the expected file?	<input type="checkbox"/>	<input type="checkbox"/>	
8.4 Pay attention to and record content and location where unusual messages were generated by the browser. For example, requests for you to “accept cookies.”			
8.4.1 Did you complete the course (from beginning to end) without any unusual messages generated by the browser?	<input type="checkbox"/>	<input type="checkbox"/>	
9. Multimedia Elements	YES	NO	
9.1 Exercise all multimedia functions throughout the courseware.			
9.1.1 Do all visual and audio elements display and play correctly?	<input type="checkbox"/>	<input type="checkbox"/>	
9.1.2 If no controls are provided for media elements, do the media play automatically without requiring user intervention?	<input type="checkbox"/>	<input type="checkbox"/>	
9.1.3 If specific learner action is prompted (either on the screen or as a course-wide convention), does all media respond as expected?	<input type="checkbox"/>	<input type="checkbox"/>	
9.1.4 If controls are provided, does all media controls work properly and consistently?	<input type="checkbox"/>	<input type="checkbox"/>	
9.1.5 Do all media elements play without generating error messages?	<input type="checkbox"/>	<input type="checkbox"/>	
9.2 If applicable, check the text display (e.g., show text or audio transcript) for audio files at all locations in the course.			
9.2.1 Does the text accurately match the audio being played?	<input type="checkbox"/>	<input type="checkbox"/>	
10. Interactive Items	YES	NO	
10.1 Try every interactive item (e.g., knowledge checks, practice exercises, practical applications, learning games,			

etc.). Pay attention to learner actions and courseware responses.			
10.1.1 Does each interactive item function as expected?	<input type="checkbox"/>	<input type="checkbox"/>	
10.1.2 Does the course provide you with adequate feedback in response to your choices/actions to facilitate learning (especially from your mistakes)?	<input type="checkbox"/>	<input type="checkbox"/>	
11. Course Completion (Complete only the <u>applicable</u> section(s)—please verify with your product developer or DCD POC. After course completion, return to MarineNet, “My Completed Courses” transcript page.	YES	NO	
11.1 For courses with no End-of-Course (EOC) Assessment (Quiz or Test).			
11.1.1 Does your transcript show status as “Completed”?	<input type="checkbox"/>	<input type="checkbox"/>	
11.2 For courses with Inline End-of- Course (EOC) Assessment: Test/Exam or Practical Application (The assessment is the last module within the course—no need to return to MarineNet for separate launch)			
11.2.1 After completing all instructional segments, close the course before launching the EOC assessment, then relaunch the course.			
11.2.1.1 Does the course bookmark your progress and allow you to access the EOC assessment without reviewing all the course material?	<input type="checkbox"/>	<input type="checkbox"/>	
11.2.2 After relaunching the course, attempt to access the EOC assessment.			
11.2.2.1 Can you open the assessment segment?	<input type="checkbox"/>	<input type="checkbox"/>	

11.2.2.2 Do the assessment instructions clearly indicate how many test attempts you are allowed before you fail the course and must begin again?

--

11.2.3 If more than one attempt is allowed, deliberately fail the assessment. (Skip to the “pass” step if only one test attempt is allowed.)			
11.2.3.1 Do the questions function correctly?	<input type="checkbox"/>	<input type="checkbox"/>	
11.2.3.2 Does the assessment provide a final score and the expected feedback?	<input type="checkbox"/>	<input type="checkbox"/>	
11.2.3.3 If multiple attempts are allowed, does your MarineNet enrollments page still display “Enrolled”?	<input type="checkbox"/>	<input type="checkbox"/>	
11.2.3.4 If only one attempt is allowed, does the course restrict you from re- entering the assessment? If not, what behavior do you see?	<input type="checkbox"/>	<input type="checkbox"/>	
11.2.4 <u>Pass the assessment.</u> Return to the course and pass the assessment.			
11.2.4.1 Do the questions function correctly?	<input type="checkbox"/>	<input type="checkbox"/>	
11.2.4.2 Does the assessment provide a final score and the expected feedback?	<input type="checkbox"/>	<input type="checkbox"/>	
11.2.4.3 Does your MarineNet transcript now show the course Status as “Passed”?	<input type="checkbox"/>	<input type="checkbox"/>	
11.3 Inline Completion Certificate (This applies to some but not all courses without an end-of-course assessment or inline EOC assessment only.)			
11.3.1 Once you complete all course content and assessments, does the course offer you the opportunity to print a completion certificate prior to exiting the course?	<input type="checkbox"/>	<input type="checkbox"/>	
11.3.2 If the course offers an inline completion certificate, follow all provided instructions to obtain your certificate.			
11.3.2.1 Does following the instructions successfully launch a certificate you can save and/or print?	<input type="checkbox"/>	<input type="checkbox"/>	
11.3.2.2 Does the course automatically display your name on the certificate? If not, does it allow you to enter your name	<input type="checkbox"/>	<input type="checkbox"/>	

manually?			
11.3.2.3 If you answered “Yes” to 11.3.2.2, does your name display and print correctly on the certificate?	<input type="checkbox"/>	<input type="checkbox"/>	
11.3.2.4 Does the course automatically display the completion date on the certificate? If not, does it allow you to enter a date manually?	<input type="checkbox"/>	<input type="checkbox"/>	
11.3.2.5 If you answered “Yes” to 11.3.2.4, does the date display and print correctly on the certificate?	<input type="checkbox"/>	<input type="checkbox"/>	
11.3.2.6 Upon printing, do all graphic and text elements appear and align correctly on the paper?	<input type="checkbox"/>	<input type="checkbox"/>	
11.4 End-of-Course (EOC) Exam (Questionmark™) The assessment is NOT included within the course. Return to MarineNet upon course completion and launch from your transcript.			
11.4.1 After course completion, return to the MarineNet transcript.			
11.4.1.1 Is the EOC exam icon visible on your enrollments page?	<input type="checkbox"/>	<input type="checkbox"/>	
11.4.1.2 Does the icon correctly launch the QMP (QuestionMark Perception) exam?	<input type="checkbox"/>	<input type="checkbox"/>	
11.4.2 Launch and deliberately fail the QMP exam.			
11.4.2.1 Does the exam provide the expected number of test questions?	<input type="checkbox"/>	<input type="checkbox"/>	
11.4.2.2 Does question presentation (all on one page or one at a time) match your expectation?	<input type="checkbox"/>	<input type="checkbox"/>	
11.4.2.3 Do the questions function correctly?	<input type="checkbox"/>	<input type="checkbox"/>	
11.4.2.4 Does the exam provide a final score and the expected feedback?	<input type="checkbox"/>	<input type="checkbox"/>	
11.4.2.5 Does your MarineNet transcript reflect how many attempts remain	<input type="checkbox"/>	<input type="checkbox"/>	
11.4.3 Launch and pass the QMP exam.			

11.4.3.1 Does the exam provide a final score and the expected feedback?	<input type="checkbox"/>	<input type="checkbox"/>	
11.4.3.2 Does your MarineNet transcript now display a status of “Passed”?	<input type="checkbox"/>	<input type="checkbox"/>	
END OF CHECKLIST			END OF CHECKLIST

APPENDIX C: MARINETNET INTEGRATION TESTING CHECKLIST

MarineNet Integration Test Checklist	
TEST LOG ID:	[For MNET ITEST admin use only]
TEST DATES:	[For MNET ITEST admin use only]
CDET POC:	[For MNET ITEST admin use only]
TESTERS:	[For MNET ITEST admin use only]
SUPPORT REQUEST #	[For MNET ITEST admin use only]
BASELINE:	[For MNET ITEST admin use only]
TEST SUPPORT INFORMATION (THIS SECTION TO BE COMPLETED BY THE POC OR DEVELOPER)	
USMC SPONSOR AGENCY/UNIT:	[USMC agency/unit sponsoring the course.]
SPONSOR CONTACT INFO:	[Government point of contact in sponsor agency— provide name, telephone number, and email address.]
DEVELOPER ORGANIZATION:	[Contractor organization developing the course.]
DEVELOPER CONTACT INFO:	[Point of contact for technical questions about the courseware—provide name, telephone number, and e- mail address.]
COURSE TITLE:	[Course name as it appears in the courseware. Keep title 40 characters or less]
COURSE CODE:	[Assigned by developer in coordination with Project Officer (see the “MarineNet Content Development Technical Standards” manual). Keep 10 characters or less]
CONTENT PACKAGE FILENAME:	[ZIP file name for content package associated with code.]
INTEGRATION TEST TYPE:	Check any that apply: <input type="checkbox"/> Courseware

	<input type="checkbox"/> Exam <input type="checkbox"/> Survey <input type="checkbox"/> Other (Specify):
INTENDED PLATFORMS DEVELOPED FOR OTHER THAN MCEN: DEVICE / OPERATING SYSTEM / BROWSER	[If there is no deviation from the MCEN baseline enter “NONE” (see the “MarineNet Content Development Technical Standards” manual for current MCEN baseline). Example: MAC OS w/ Chrome or iPhone w/ Safari]
DEVIATION FROM MARINENET SCORM VERSION*:	[Yes or N/A—if yes, has a waiver been granted for use of anything other than the current MarineNet SCORM version? Please provide the exact version and edition number (e.g. SCORM 1.2, 2004 ver. 4, etc.)]
SINGLE-SCO OR MULTI-SCO CONFIGURATION*:	Pick one option from below: <input type="checkbox"/> Single-SCO <input type="checkbox"/> Multi-SCO (provide detailed course flow chart with submission of this checklist)
BOOKMARKSTRATEGY:	[Applies to all course types—If applicable, describe intended bookmark behavior. Is the bookmark saved across sessions? At what level does it mark (e.g., the exact screen from which the learner exits; the first screen of the current topic)? Does the bookmark strategy differ for assessments, scenarios, and evaluations? Is the bookmarking strategy the same for all SCOs in the course?] List and describe the bookmark strategy for all SCO’s: For example: SCO 1: (This SCO only has content pages). The bookmark is set on the page user exits the SCO. SCO 2: (This SCO has scenarios) The bookmark is set on the page user exits the SCO unless user exits within a scenario. In which case, the bookmark is set on the first page of current scenario. SCO 3: (This SCO has an assessment). The bookmark is set on the page user exits the SCO unless user exits within an assessment. In which case, the bookmark is set on the first page of current assessment.

	SCO 4: ... and so on ...
SEQUENCING/NAVIGATION STRATEGY*:	[Applies to SCORM 2004 courses only—if sequenced, must clearly depict sequencing on course flow chart.]
COURSE “COMPLETION” REQUIREMENTS*: (PROVIDE ANSWER KEY FOR ANY REQUIRED INTERACTIONS)	[Tell us <u>exactly</u> what a learner <u>must</u> do to enable communication of completed status to the LMS. What screens must be touched? What interactions must be completed and to what extent. For example, if required to answer a question, must the learner repeat until the correct response is submitted?]
SEPARATE TEST/EXAM/SCORED PRACTICAL APPLICATION INCLUDED FOR TESTING*: (PROVIDE ANSWER KEY)	[Yes or N/A—if yes, must be delivered as an in-line SCO, multiple sequenced SCOs, or a QuestionMark™ Perception™ Q-Pack with a list of required QMP settings. Specify the type, provide the answer key and pass/fail criteria. Also, specify whether or not a passing or failing score should display on the MarineNet transcript.]
Q-PACK SURVEY INCLUDED FOR TESTING:	[Yes or N/A—if yes, must be delivered as a QuestionMark™ Perception™ Q-Pack with list of required QMP settings.]
OPTIMAL DISPLAY RESOLUTION*:	[Enter the optimal display resolution for your courseware. See the “MarineNet Content Development Technical Standards” manual for max display resolution supported.]
CONTENT AREA DIMENSIONS (INCLUDING GUI)*:	[Specify height and width of the course screen in pixels. Include any GUI elements like banners and navigation bars. See the “MarineNet Content Development Technical Standards” manual for max content area dimensions.]

MNET TECHNICAL STANDARDSWAIVERS*:	[List any CDET-approved waivers, if granted.]
SPECIALINSTRUCTIONS:	[List any special instructions for testing to include the platforms the test should take place on (i.e., Mac, PC, IE, Chrome, and/or Mobile devices). Default settings for the SCORM engine will be used unless there are special instructions to change the settings. Default SCORM engine settings can be found in the MarineNet Content Development Technical Standardsdocument.]
DELIVERY METHOD TO TEST FACILITY:	Check any that apply: <input type="checkbox"/> Stage 1 <input type="checkbox"/> Stage 3 / RTE <input type="checkbox"/> e-Delivery (i.e., FTP, Email, or Remedy) <input type="checkbox"/> Shipment Information:
ADDITIONALCOMMENTS:	[List any other special considerations that were not captured in the checklist.]

----- AREA BELOW FOR MNET I-TESTER USE ONLY -----

TEST CRITERIA	
DIRECTIONS: Place a Y, N, or N/A in the comments column of the checklist in response to each corresponding system testing guideline. Add comments where appropriate.	COMMENTS
1. PRE-INSTALLATION INSPECTION:	
1.1. COURSE DOCUMENTATION INSPECTION:	
Note: If documentation is incomplete, do not initiate testing without DCD Department Head authorization.	
1.1.1. Course Flow Chart: If the course is multi-SCO, was a complete course flow chart provided?	
1.1.2. Test Checklist-Test Support Information: Check the MarineNet Integration Test Checklist. Is all Test Support Information provided?	
1.1.3. Test Checklist-Completion Requirements and Answer Keys: In the test checklist, did the developer describe all requirements to achieve courseware completion status? If required for completion, were correct responses for all activities/assessments/evaluations provided?	
2. INSTALLATION TESTS:	
2.1. LMS MODE:	
2.1.1. SCORM Import Manifest: Does the courseware include the SCORM manifest file imsmanifest.xml?	
2.1.2. Import the Course: If the imsmanifest.xml file is provided, import the course into the SCORM Engine. Did the course import without errors?	

<p>2.1.3. Default SCORM Settings: The SCORM Engine’s default settings for a SCORM course are listed here. Any changes to these default settings should be identified in the additional comments section to the right. Annotate any differences in settings as delivered or necessary default settings that are not listed:</p> <p><i>SCORM 2004 defaults</i> SCO Launch Type: New window without browser toolbar. Wrap SCO window with API: Yes Player Launch Type: New window without browser toolbar. Desired Width: 1010 Desired Height: 655</p> <p><i>SCORM 1.2 defaults (Waiver needed)</i> SCO Launch Type: New window Wrap SCO window with API: Yes Player Launch Type: Frameset Desired Width: 1024 Desired Height: 768</p>	
--	--

3. TEST OF SYSTEM LAUNCH:

3.1. SCREEN SIZE:

<p>3.1.1. Window Size: Are courseware screens displaying properly in the standard video screen resolution of 1024x768? Note: If the courseware is intended to run at 800x600, it should simply generate a window that does not occupy the entire monitor screen—do not change the testing monitor resolution.</p>	
--	--

--	--

3.2. Launch Behavior (LMS Mode)	
<p>3.2.1. Opening Screen: Launch the courseware from the LMS using the included procedures. Do the launch procedures display the proper opening screen under LMS operating mode?</p>	
<p>3.2.2. Transcript Record: After launching the course, navigate through a representative sample of the course then exit the course to return to the LMS. Does the enrollment record still appear with a status of Enrolled?</p>	
4. IMI INTEGRATION TESTS:	
4.1. STATIC CODE REVIEW:	
<p>4.1.1. Server Side Code: Browse through the courseware directory. Is the courseware free of the use of any type of server side code (i.e., CFM, CGI, JSP)? If server side code is found, identify why it is used in the comments box to the right.</p>	
4.2. SCORM ENGINE-GENERATED COURSE MENU:	
<p>4.2.1. SE Menu SCO Display: Compare the SE menu to the course flow chart. If the course uses simple sequencing, does the menu reflect each SCO within the course? If the course uses complex sequencing and navigation, does the SE menu reflect the provided flow chart?</p>	
<p>4.2.2. SE Menu Functionality: Test each link in the SE menu. Does each menu item respond as expected per the course flow chart?</p>	

4.2.3. SE Menu Display: Monitor the menu display as you test the course for completion/success status. Does each menu item correctly display current completion/success status?

4.3. Page Entry and Exit:	
<p>4.3.1. Normal Operation: <u>If applicable</u>, test bookmarking using three methods for exiting: CLOSE button, selection of a different SCO from SE Menu (if applicable), and selection of the SE Return to MarineNet link. Does the courseware set and retrieve bookmarks without error?</p>	
<p>4.3.2. Alternate Operation: <u>If applicable</u>, test book-marking using alternative methods for exiting (i.e. using ALT- F4 or the browser's X button). Does the courseware set and retrieve bookmarks without error?</p>	
<p>4.3.3. Abnormal Termination: <u>If applicable</u>, test bookmarking under conditions of abnormal termination or software crash. On Windows OS machines: Open Windows Task Manager, select iexplore.exe, then click End Process. On Mac OS: Open the Apple menu, select Force Quit, select the appropriate application, then click Force Quit.</p> <p>Does the courseware return to the last saved bookmark location (objective), or the initial course entry page (threshold)? <i>The courseware must not crash, hang, or trap the user on the page where the crash occurred.</i></p>	
<p>4.3.4. Cookie Use: Exit the course and examine the cookies directory on the workstation. Has the courseware avoided the use of session cookies?</p>	
4.4. COURSE COMPLETION :	

4.4.1. Course Completion

Functionality: Step through the course, following all instructions for course completion, then exit the course. Review the transcript for the test user. Does the transcript list the course completion status as Completed?

4.5. SCORM SEQUENCING AND NAVIGATION (FOR SCORM 2004 COURSES):	
4.5. SCORM Sequencing and Navigation (for SCORM 2004 courses):	
4.5.1. Sequencing and Navigation Rules Provided: If the course is a multi-SCO course, examine the Supporting Information and the Flow Chart. Does the vendor clearly describe and/or illustrate the sequencing rules and strategy applied in the course?	
4.5.2. Sequencing and Navigation Rules Validity: Compare the intended sequencing and navigation to actual course behavior as you progress through the course. Does the course's sequencing operate as described in the flowchart by the vendor?	
5. OPERATIONAL (DYNAMIC) TESTS:	
5.1. PLUG-INS AND MEDIA PLAY:	
5.1.1. Version Compatibility: Are plug-in versions expected by the courseware compatible with those provided by MCEN?	
5.1.2. Standard Plug-In Use: Exercise the courseware, particularly the multimedia functions. Does the software utilize only USMC-approved plug-ins?	
5.1.3. Media Play: Exercise the courseware, particularly the multimedia functions. Do all assets play correctly? a) If no controls are provided for media elements, do the media play automatically without requiring user intervention? b) If specific learner action is prompted (either on the screen or as a course-wide convention), does the media respond as expected? c) If controls are provided, do all media controls work properly and consistently?	

<p>5.1.4. Media File Types: If audio and or video media are used in the course, is the courseware using approved media file types (see the “MarineNet Content Development Technical Standards” manual for approved media file types)? If other media file types are used, has a CDET waiver been noted? Browse through the course directory and note the number and file size range for the various media files types in the comments column to the right.</p>	
<p>5.2. PERFORMANCE:</p>	
<p>5.2.1. Courseware Media Responsiveness: During system testing, be aware of the overall responsiveness of the courseware under test. Does the courseware provide response times as specified in the MarineNet Content Development Technical Standards?</p>	
<p>5.2.2. Overall Page Responsiveness: During system testing, be aware of the overall responsiveness of the courseware under test. Under normal conditions, do any part(s) of the courseware (multimedia and text) take longer than 10 seconds to fully load?</p>	

5.2.3. Page Navigation Responsiveness:

Evaluate the response time of advancing to the next screen (using the next button). Does the courseware allow the user to progress to the next screen within 5 seconds - even if the current page did not finish loading? Note: Courseware navigation menus or frames are not considered in the time a page takes to load.

6. COURSE-LEVEL USER INTERFACE

Note: The USMC sponsor has already conducted a screen-by-screen GUI functionality test in the MarineNet Stage environment. Section 7 is a spot-check for verification only.

6.1. NAVIGATION

6.1.1. Navigation Functionality: Does the course provide a means for the learner to move forward and backward between screens? If not, is another navigation scheme employed to move the learner through the content? Does the existing navigation function properly?

6.1.2. Screen Counter Functionality: **If applicable**, check the screen counter display on several screens in each SCO. Does the screen counter consistently and correctly display the current screen number and the total number of screens within the SCO (or according to an alternative numbering scheme)?

6.2. INTERNAL COURSE MENU (AS APPLICABLE)

6.2.1. MENU Contents: Open the courseware internal menu. Does the menu appear to reflect the course structure (at least to the lesson level)?

6.2.2. MENU Functionality: Try several hyperlinks on the Menu in the courseware under test. Does each tested hyperlinked item on the screen bring up the appropriate course segment?

6.2.3. MENU Functionality: Spot-check the internal Menu as you proceed through the course. If intended to do so, does each hyperlinked item display the correct unvisited/visited status or correctly track the learner's progress through the course?

6.3. OTHER GUI ELEMENTS (AS APPLICABLE)	
6.3.1. GUI Element Functionality: From various screens within each SCO of the courseware under test, try each available user interface element at least once. Do all elements function correctly?	
6.3.2. Help/Directions Sufficiency: As you move through the course, pay attention to the availability of help and the quality of directions to the learner. Is such learner support sufficient to allow the learner to successfully complete the course without additional explanation or outside assistance? Annotate anything that is likely to prompt a learner to call the MarineNet Helpdesk.	
7. FINAL STUDENT ASSESSMENT INSTRUMENT	
This section applies to final student assessments that must be passed in order to complete the course. Use the support request information and/or examine the course content package to determine the type of EOC student assessment provided (if any). Select the appropriate 8.x section to test the EOC assessment.	
7.1. End of Course Assessment (QuestionMark Exam):	
7.1.1. EOC QMP Exam Existence: Was EOC exam for delivery in QMP provided?	
7.1.2. EOC QMP Exam Access: After course completion, return to the MarineNet transcript. Is the EOC exam icon visible in the transcript? Does the icon correctly launch the QMP exam?	
7.1.3. EOC QMP Exam Format: Launch the QMP exam. Does it conform to the USMC EOC exam template?	
7.1.4. EOC QMP Exam Operation (Items): Evaluate the EOC exam in the LMS. Does the template function properly? Do the questions function properly?	

<p>7.1.5. EOC QMP Exam Operation (Feedback): Complete the EOC exam in the LMS. Does the EOC exam provide a final score to the user when the exam is completed? Does the exam provide the standard feedback messages when completed? Does the exam correctly provide topic-level feedback?</p>	
<p>7.1.6. MarineNet Course Completion: Pass the EOC QMP exam and then return to the Transcript page of the LMS. Does the course's transcript record display a status of <i>Passed</i>? If applicable per the Test Support Information, does the course's transcript record display the correct score?</p>	
<p>7.2. END-OF-COURSE EVALUATION (IN-LINE EXAM):</p>	
<p>7.2.1. EOC In-Line Exam Existence: If a QMP exam was not provided, examine the support request information and the course content package. Was an In-line EOC exam provided as one or more SCOs within the content package?</p>	
<p>7.2.2. EOC In-Line Exam Operation (Items): Evaluate the EOC <i>In-Line exam</i> in the LMS. Do the questions function properly?</p>	
<p>7.2.3. EOC In-Line Exam Operation (Feedback): Complete the EOC In-Line exam in the LMS. Does the EOC exam provide a final score to the user when the exam is completed? Does any additional feedback display correctly?</p>	

7.2.4. MarineNet Course Completion:

Pass the EOC In-Line exam and then return to the Transcript page of the LMS. Does the course's transcript record display a status of *Passed*? If applicable per the Test Support Information, does the course's transcript record display the correct score?

7.3. END-OF-COURSE EVALUATION (IN-LINE PRACTICAL EVALUATION [PE]):	
7.3.1. EOC In-Line PE Existence: If a QMP exam was not provided, examine the support request information and the course content package. Was an in-line EOC PE provided as one or more SCOs within the content package?	
7.3.2. EOC In-Line PE Operation: Execute all required interactions. Do all interactive elements appear to function properly?	
7.3.3. EOC In-Line PE Operation (Feedback): Complete the PE according to the provided instructions. Does the evaluation provide a final score (or pass/fail status) to the user when the exam is completed? Does any additional feedback display correctly?	
7.3.4. MarineNet Course Completion: Pass the EOC practical evaluation and then return to the Transcript page of the LMS. Does the course's transcript record display a status of <i>Passed</i> ? If applicable per the Test Support Information, does the course's transcript record display the correct score?	
7.4. END-OF-COURSE SURVEY (QUESTIONMARK™):	
7.4.1. EOC Survey Existence: Is a QMP EOC survey provided?	
7.4.2. EOC Survey Operation: Observe the MarineNet transcript and annotate when the EOC Survey icon appears. Does it appear upon completion of the EOC final evaluation or after completion of the course material if an EOC final evaluation does not exist? Is the course grade and completion correctly withheld from the transcript at this point in the process?	
7.4.3. EOC Survey Format: Does the survey conform to the USMC EOC survey template?	
7.4.4. EOC Survey Operation: Evaluate the EOC survey in the LMS. Do the questions function properly?	

7.4.5. EOC Survey Completion:

Complete and submit the survey. Does the final course grade and completion now appear on the transcript?

APPENDIX D: MARINENET ACCEPTABLE FILE TYPES

fileExtension='.323' mimeType='text/h323' fileExtension='.aaf' mimeType='application/octet-stream'
fileExtension='.aca' mimeType='application/octet-stream' fileExtension='.accdb' mimeType='application/msaccess'
fileExtension='.accde' mimeType='application/msaccess' fileExtension='.accdt' mimeType='application/msaccess'
fileExtension='.acx' mimeType='application/internet-property-stream' fileExtension='.afm'
mimeType='application/octet-stream' fileExtension='.ai' mimeType='application/postscript' fileExtension='.aif'
mimeType='audio/x-aiff'
fileExtension='.aifc' mimeType='audio/aiff' fileExtension='.aiff' mimeType='audio/aiff'
fileExtension='.application' mimeType='application/x-ms-application' fileExtension='.art' mimeType='image/x-jg'
fileExtension='.asd' mimeType='application/octet-stream' fileExtension='.asf' mimeType='video/x-ms-asf'
fileExtension='.asi' mimeType='application/octet-stream' fileExtension='.asm' mimeType='text/plain'
fileExtension='.asr' mimeType='video/x-ms-asf' fileExtension='.asx' mimeType='video/x-ms-asf'
fileExtension='.atom' mimeType='application/atom+xml'
fileExtension='.au' mimeType='audio/basic' fileExtension='.avi'
mimeType='video/x-msvideo' fileExtension='.axs'
mimeType='application/olescript' fileExtension='.bas'
mimeType='text/plain' fileExtension='.bcpio'
mimeType='application/x-bcpio' fileExtension='.bin'
mimeType='application/octet-stream' fileExtension='.bmp'
mimeType='image/bmp' fileExtension='.c'
mimeType='text/plain' fileExtension='.cab'
mimeType='application/octet-stream'
fileExtension='.calx' mimeType='application/vnd.ms-office.calx'
fileExtension='.cat' mimeType='application/vnd.ms-pki.seccat'
fileExtension='.cdf' mimeType='application/x-cdf'
fileExtension='.chm' mimeType='application/octet-stream'
fileExtension='.class' mimeType='application/x-java-applet'
fileExtension='.clip' mimeType='application/x-msclip'
fileExtension='.cmx' mimeType='image/x-cmx' fileExtension='.cnf'
mimeType='text/plain'
fileExtension='.cod' mimeType='image/cis-cod'
fileExtension='.cpio' mimeType='application/x-cpio'
fileExtension='.cpp' mimeType='text/plain' fileExtension='.crd'
mimeType='application/x-mscardfile' fileExtension='.crl'
mimeType='application/pkix-crl' fileExtension='.crt'
mimeType='application/x-x509-ca-cert' fileExtension='.csh'
mimeType='application/x-csh' fileExtension='.css'
mimeType='text/css' fileExtension='.csv'
mimeType='application/octet-stream' fileExtension='.cur'
mimeType='application/octet-stream' fileExtension='.dcr'
mimeType='application/x-director'
fileExtension='.deploy' mimeType='application/octet-stream'
fileExtension='.der' mimeType='application/x-x509-ca-cert'
fileExtension='.dib' mimeType='image/bmp' fileExtension='.dir'
mimeType='application/x-director' fileExtension='.disco'
mimeType='text/xml' fileExtension='.dll'
mimeType='application/x-msdownload'
fileExtension='.dll.config' mimeType='text/xml'
fileExtension='.dlm' mimeType='text/dlm' fileExtension='.doc'
mimeType='application/msword'

fileExtension='.docm' mimeType='application/vnd.ms-word.document.macroEnabled.12'
fileExtension='.docx'
mimeType='application/vnd.openxmlformats-officedocument.wordprocessingml.document'
fileExtension='.dot' mimeType='application/msword'
fileExtension='.dotm' mimeType='application/vnd.ms-word.template.macroEnabled.12'
fileExtension='.dotx' mimeType='application/vnd.openxmlformats-officedocument.wordprocessingml.template' fileExtension='.dsp' mimeType='application/octet-stream'
fileExtension='.dtd' mimeType='text/xml' fileExtension='.dvi'
mimeType='application/x-dvi' fileExtension='.dwf'
mimeType='drawing/x-dwf' fileExtension='.dwp'
mimeType='application/octet-stream' fileExtension='.dxi'
mimeType='application/x-director' fileExtension='.eml'
mimeType='message/rfc822' fileExtension='.emz'
mimeType='application/octet-stream' fileExtension='.eot'
mimeType='application/octet-stream' fileExtension='.eps'
mimeType='application/postscript' fileExtension='.etx'
mimeType='text/x-setext' fileExtension='.evy'
mimeType='application/envoy' fileExtension='.exe'
mimeType='application/octet-stream'
fileExtension='.exe.config' mimeType='text/xml'
fileExtension='.fdf' mimeType='application/vnd.fdf'
fileExtension='.fif' mimeType='application/fractals'
fileExtension='.fla' mimeType='application/octet-stream'
fileExtension='.flr' mimeType='x-world/x-vrml'
fileExtension='.flv' mimeType='video/x-flv' fileExtension='.gif'
mimeType='image/gif' fileExtension='.gtar'
mimeType='application/x-gtar' fileExtension='.gz'
mimeType='application/x-gzip'
fileExtension='.h' mimeType='text/plain' fileExtension='.hdf'
mimeType='application/x-hdf' fileExtension='.hdml'
mimeType='text/x-hdml' fileExtension='.hhc'
mimeType='application/x-oleobject' fileExtension='.hhk'
mimeType='application/octet-stream' fileExtension='.hhp'
mimeType='application/octet-stream' fileExtension='.hlp'
mimeType='application/winhlp' fileExtension='.hqx'
mimeType='application/mac-binhex40' fileExtension='.hta'
mimeType='application/hta' fileExtension='.htc'
mimeType='text/x-component' fileExtension='.htm'
mimeType='text/html' fileExtension='.html' mimeType='text/html'
fileExtension='.htt' mimeType='text/webviewhtml'
fileExtension='.hxt' mimeType='text/html' fileExtension='.ico'
mimeType='image/x-icon' fileExtension='.ics'
mimeType='application/octet-stream' fileExtension='.ief'
mimeType='image/ief' fileExtension='.iii'
mimeType='application/x-iphone' fileExtension='.inf'
mimeType='application/octet-stream'
fileExtension='.ins' mimeType='application/x-internet-signup'
fileExtension='.isp' mimeType='application/x-internet-signup'
fileExtension='.IVF' mimeType='video/x-ivf' fileExtension='.jar'
mimeType='application/java-archive' fileExtension='.java'
mimeType='application/octet-stream' fileExtension='.jck'
mimeType='application/liquidmotion' fileExtension='.jcz'
mimeType='application/liquidmotion' fileExtension='.jfif'
mimeType='image/jpeg' fileExtension='.jpb'
mimeType='application/octet-stream' fileExtension='.jpe'

contentType='image/jpeg' fileExtension='.jpeg'
contentType='image/jpeg' fileExtension='.jpg' contentType='image/jpeg'
fileExtension='.js' contentType='application/x-javascript'
fileExtension='.jsx' contentType='text/jsx' fileExtension='.latex'
contentType='application/x-latex' fileExtension='.lit'
contentType='application/x-ms-reader' fileExtension='.lpk'
contentType='application/octet-stream' fileExtension='.lsf'
contentType='video/x-la-asf' fileExtension='.lsx' contentType='video/x-
la-asf' fileExtension='.lzh' contentType='application/octet-stream'
fileExtension='.m13' contentType='application/x-msmediaview'
fileExtension='.m14' contentType='application/x-msmediaview'
fileExtension='.m1v' contentType='video/mpeg' fileExtension='.m3u'
contentType='audio/x-mpegurl' fileExtension='.man'
contentType='application/x-troff-man'
fileExtension='.manifest' contentType='application/x-ms-manifest'
fileExtension='.map' contentType='text/plain' fileExtension='.mdb'
contentType='application/x-msaccess' fileExtension='.mdp'
contentType='application/octet-stream' fileExtension='.me'
contentType='application/x-troff-me' fileExtension='.mht'
contentType='message/rfc822' fileExtension='.mhtml'
contentType='message/rfc822' fileExtension='.mid' contentType='audio/mid'
fileExtension='.midi' contentType='audio/mid' fileExtension='.mix'
contentType='application/octet-stream' fileExtension='.mmf'
contentType='application/x-smaf' fileExtension='.mno'
contentType='text/xml' fileExtension='.mny'
contentType='application/x-msmoney' fileExtension='.mov'
contentType='video/quicktime' fileExtension='.movie'
contentType='video/x-sgi-movie' fileExtension='.mp2'
contentType='video/mpeg' fileExtension='.mp3'
contentType='audio/mpeg' fileExtension='.mpa'
contentType='video/mpeg' fileExtension='.mpe'
contentType='video/mpeg' fileExtension='.mpeg'
contentType='video/mpeg' fileExtension='.mpg'
contentType='video/mpeg'
fileExtension='.mpp' contentType='application/vnd.ms-project'
fileExtension='.mpv2' contentType='video/mpeg' fileExtension='.ms'
contentType='application/x-troff-ms' fileExtension='.msi'
contentType='application/octet-stream' fileExtension='.mso'
contentType='application/octet-stream' fileExtension='.mvb'
contentType='application/x-msmediaview' fileExtension='.mvc'
contentType='application/x-miva-compiled' fileExtension='.nc'
contentType='application/x-netcdf' fileExtension='.nsc'
contentType='video/x-ms-asf' fileExtension='.nws'
contentType='message/rfc822' fileExtension='.ocx'
contentType='application/octet-stream' fileExtension='.oda'
contentType='application/oda' fileExtension='.odc' contentType='text/x-
ms-odc' fileExtension='.ods' contentType='application/oleobject'
fileExtension='.one' contentType='application/onenote'
fileExtension='.onea' contentType='application/onenote'
fileExtension='.onetoc' contentType='application/onenote'
fileExtension='.onetoc2' contentType='application/onenote'
fileExtension='.onetmp' contentType='application/onenote'
fileExtension='.onepkg' contentType='application/onenote'
fileExtension='.osdx' contentType='application/opensearchdescription+xml' fileExtension='.p10'
contentType='application/pkcs10'

fileExtension='.p12' mimeType='application/x-pkcs12'
fileExtension='.p7b' mimeType='application/x-pkcs7-certificates'
fileExtension='.p7c' mimeType='application/pkcs7-mime'
fileExtension='.p7m' mimeType='application/pkcs7-mime'
fileExtension='.p7r' mimeType='application/x-pkcs7-certreqresp'
fileExtension='.p7s' mimeType='application/pkcs7-signature'
fileExtension='.pbm' mimeType='image/x-portable-bitmap'
fileExtension='.pcx' mimeType='application/octet-stream'
fileExtension='.pcz' mimeType='application/octet-stream'
fileExtension='.pdf' mimeType='application/pdf' fileExtension='.pfb'
mimeType='application/octet-stream' fileExtension='.pfm'
mimeType='application/octet-stream' fileExtension='.pfx'
mimeType='application/x-pkcs12' fileExtension='.pgm'
mimeType='image/x-portable-graymap' fileExtension='.pko'
mimeType='application/vnd.ms-pki.pko' fileExtension='.pma'
mimeType='application/x-perfmon' fileExtension='.pmc'
mimeType='application/x-perfmon' fileExtension='.pml'
mimeType='application/x-perfmon' fileExtension='.pmr'
mimeType='application/x-perfmon' fileExtension='.pmw'
mimeType='application/x-perfmon' fileExtension='.png'
mimeType='image/png' fileExtension='.pnm' mimeType='image/x-
portable-anymap' fileExtension='.pnz' mimeType='image/png'
fileExtension='.pot' mimeType='application/vnd.ms-powerpoint'
fileExtension='.potm' mimeType='application/vnd.ms-powerpoint.template.macroEnabled.12'
fileExtension='.potx' mimeType='application/vnd.openxmlformats-officedocument.presentationml.template'
fileExtension='.ppam' mimeType='application/vnd.ms-powerpoint.addin.macroEnabled.12'
fileExtension='.ppm' mimeType='image/x-portable-pixmap'
fileExtension='.pps' mimeType='application/vnd.ms-powerpoint'
fileExtension='.ppsm' mimeType='application/vnd.ms-powerpoint.slideshow.macroEnabled.12'
fileExtension='.ppsx' mimeType='application/vnd.openxmlformats-
officedocument.presentationml.slideshow' fileExtension='.ppt' mimeType='application/vnd.ms-powerpoint'
fileExtension='.pptm' mimeType='application/vnd.ms-
powerpoint.presentation.macroEnabled.12' fileExtension='.pptx'
mimeType='application/vnd.openxmlformats-officedocument.presentationml.presentation'
fileExtension='.prf' mimeType='application/pics-rules'
fileExtension='.prm' mimeType='application/octet-stream'
fileExtension='.prx' mimeType='application/octet-stream'
fileExtension='.ps' mimeType='application/postscript'
fileExtension='.psd' mimeType='application/octet-stream'
fileExtension='.psm' mimeType='application/octet-stream'
fileExtension='.psp' mimeType='application/octet-stream'
fileExtension='.pub' mimeType='application/x-mspublisher'
fileExtension='.qt' mimeType='video/quicktime' fileExtension='.qtl'
mimeType='application/x-quicktimeplayer' fileExtension='.qxd'
mimeType='application/octet-stream' fileExtension='.ra'
mimeType='audio/x-pn-realaudio' fileExtension='.ram'
mimeType='audio/x-pn-realaudio' fileExtension='.rar'
mimeType='application/octet-stream' fileExtension='.ras'
mimeType='image/x-cmu-raster' fileExtension='.rf'
mimeType='image/x-rgb' fileExtension='.rm'
mimeType='application/vnd.rn-realmedia' fileExtension='.rmi'
mimeType='audio/mid' fileExtension='.roff'
mimeType='application/x-troff' fileExtension='.rpm'
mimeType='audio/x-pn-realaudio-plugin' fileExtension='.rtf'
mimeType='application/rtf' fileExtension='.rtx'

contentType='text/richtext' fileExtension='.scd'
contentType='application/x-msschedule' fileExtension='.sct'
contentType='text/scriptlet' fileExtension='.sea'
contentType='application/octet-stream'
fileExtension='.setpay' contentType='application/set-payment-initiation'
fileExtension='.setreg' contentType='application/set-registration-initiation'
fileExtension='.sgml' contentType='text/sgml'
fileExtension='.sh' contentType='application/x-sh' fileExtension='.shar'
contentType='application/x-shar' fileExtension='.sit'
contentType='application/x-stuffit'
fileExtension='.sldm' contentType='application/vnd.ms-powerpoint.slide.macroEnabled.12'
fileExtension='.sldx' contentType='application/vnd.openxmlformats-officedocument.presentationml.slide'
fileExtension='.smd' contentType='audio/x-smd'
fileExtension='.smi' contentType='application/octet-stream'
fileExtension='.smx' contentType='audio/x-smd' fileExtension='.smz'
contentType='audio/x-smd' fileExtension='.snd' contentType='audio/basic'
fileExtension='.snp' contentType='application/octet-stream'
fileExtension='.spc' contentType='application/x-pkcs7-certificates'
fileExtension='.spl' contentType='application/futuresplash'
fileExtension='.src' contentType='application/x-wais-source'
fileExtension='.ssm' contentType='application/streamingmedia'
fileExtension='.sst' contentType='application/vnd.ms-pki.certstore'
fileExtension='.stl' contentType='application/vnd.ms-pki.stl'
fileExtension='.sv4cpio' contentType='application/x-sv4cpio'
fileExtension='.sv4crc' contentType='application/x-sv4crc'
contentType='application/x-troff' fileExtension='.tar'
contentType='application/x-tar' fileExtension='.tcl'
contentType='application/x-tcl' fileExtension='.tex'
contentType='application/x-tex' fileExtension='.texi'
contentType='application/x-texinfo' fileExtension='.texinfo'
contentType='application/x-texinfo' fileExtension='.tgz'
contentType='application/x-compressed' fileExtension='.thmx'
contentType='application/vnd.ms-officetheme' fileExtension='.thn'
contentType='application/octet-stream' fileExtension='.tif'
contentType='image/tiff'
fileExtension='.tiff' contentType='image/tiff' fileExtension='.toc'
contentType='application/octet-stream' fileExtension='.tr'
contentType='application/x-troff' fileExtension='.trm'
contentType='application/x-msterminal' fileExtension='.tsv'
contentType='text/tab-separated-values' fileExtension='.ttf'
contentType='application/octet-stream' fileExtension='.txt'
contentType='text/plain' fileExtension='.u32'
contentType='application/octet-stream' fileExtension='.uls'
contentType='text/iuls' fileExtension='.ustar'
contentType='application/x-ustar' fileExtension='.vbs'
contentType='text/vbscript' fileExtension='.vcf' contentType='text/x-vcard' fileExtension='.vcs' contentType='text/plain'
fileExtension='.vdx' contentType='application/vnd.ms-visio.viewer' fileExtension='.vml' contentType='text/xml'
fileExtension='.vsd' contentType='application/vnd.visio'
fileExtension='.vss' contentType='application/vnd.visio'
fileExtension='.vst' contentType='application/vnd.visio'
fileExtension='.vsto' contentType='application/x-ms-vsto'
fileExtension='.vsw' contentType='application/vnd.visio'
fileExtension='.vsx' contentType='application/vnd.visio'

fileExtension='.vtx' mimeType='application/vnd.visio'
fileExtension='.wav' mimeType='audio/wav' fileExtension='.wax'
mimeType='audio/x-ms-wax' fileExtension='.wbmp'
mimeType='image/vnd.wap.wbmp' fileExtension='.wcm'
mimeType='application/vnd.ms-works' fileExtension='.wdb'
mimeType='application/vnd.ms-works' fileExtension='.wks'
mimeType='application/vnd.ms-works' fileExtension='.wm'
mimeType='video/x-ms-wm' fileExtension='.wma'
mimeType='audio/x-ms-wma' fileExtension='.wmd'
mimeType='application/x-ms-wmd' fileExtension='.wmf'
mimeType='application/x-msmetafile' fileExtension='.wml'
mimeType='text/vnd.wap.wml' fileExtension='.wmlc'
mimeType='application/vnd.wap.wmlc' fileExtension='.wmls'
mimeType='text/vnd.wap.wmlscript'
fileExtension='.wmlsc' mimeType='application/vnd.wap.wmlscriptc'
fileExtension='.wmp' mimeType='video/x-ms-wmp' fileExtension='.wmv'
mimeType='video/x-ms-wmv' fileExtension='.wmx' mimeType='video/x-
ms-wmx' fileExtension='.wmz' mimeType='application/x-ms-wmz'
fileExtension='.wps' mimeType='application/vnd.ms-works'
fileExtension='.wri' mimeType='application/x-mswrite' fileExtension='.wrl'
mimeType='x-world/x-vrml' fileExtension='.wrz' mimeType='x-world/x-
vrml' fileExtension='.wsdl' mimeType='text/xml'
fileExtension='.wvx' mimeType='video/x-ms-wvx' fileExtension='.x'
mimeType='application/directx' fileExtension='.xaf' mimeType='x-
world/x-vrml' fileExtension='.xaml'
mimeType='application/xaml+xml' fileExtension='.xap'
mimeType='application/x-silverlight-app' fileExtension='.xbap'
mimeType='application/x-ms-xbap' fileExtension='.xbm'
mimeType='image/x-xbitmap' fileExtension='.xdr'
mimeType='text/plain' fileExtension='.xht'
mimeType='application/xhtml+xml' fileExtension='.xhtml'
mimeType='application/xhtml+xml' fileExtension='.xla'
mimeType='application/vnd.ms-excel'
fileExtension='.xlam' mimeType='application/vnd.ms-excel.addin.macroEnabled.12'
fileExtension='.xlc' mimeType='application/vnd.ms-excel'
fileExtension='.xlm' mimeType='application/vnd.ms-excel'
fileExtension='.xls' mimeType='application/vnd.ms-excel'
fileExtension='.xlsb' mimeType='application/vnd.ms-excel.sheet.binary.macroEnabled.12'
fileExtension='.xlsm' mimeType='application/vnd.ms-excel.sheet.macroEnabled.12'
fileExtension='.xlsx' mimeType='application/vnd.openxmlformats-
officedocument.spreadsheetml.sheet' fileExtension='.xlt' mimeType='application/vnd.ms-excel'
fileExtension='.xltn' mimeType='application/vnd.ms-excel.template.macroEnabled.12'
fileExtension='.xltx' mimeType='application/vnd.openxmlformats-officedocument.spreadsheetml.template'
fileExtension='.xlw' mimeType='application/vnd.ms-excel'
fileExtension='.xml' mimeType='text/xml'
fileExtension='.xof' mimeType='x-world/x-vrml'
fileExtension='.xpm' mimeType='image/x-pixmap'
fileExtension='.xps' mimeType='application/vnd.ms-xpsdocument'
fileExtension='.xsd' mimeType='text/xml'
fileExtension='.xsf' mimeType='text/xml' fileExtension='.xsl'
mimeType='text/xml' fileExtension='.xslt' mimeType='text/xml'
fileExtension='.xsn' mimeType='application/octet-stream'
fileExtension='.xtp' mimeType='application/octet-stream'
fileExtension='.xwd' mimeType='image/x-xwindowdump'

fileExtension='.z' mimeType='application/x-compress'
fileExtension='.zip' mimeType='application/x-zip-compressed'
fileExtension='.data' mimeType='application/octet-stream'
fileExtension='.mem' mimeType='application/octet-stream'
fileExtension='.apack' mimeType='application/octet-stream'
fileExtension='.brand' mimeType='application/octet-stream'
fileExtension='.cfg' mimeType='application/octet-stream'
fileExtension='.crs' mimeType='application/octet-stream'
fileExtension='.cst' mimeType='application/octet-stream'
fileExtension='.ct_' mimeType='application/octet-stream'
fileExtension='.ctl' mimeType='text/plain'
fileExtension='.ctz' mimeType='application/octet-stream'
fileExtension='.dbf' mimeType='application/octet-stream'
fileExtension='.des' mimeType='application/octet-stream'
fileExtension='.dt\$' mimeType='application/octet-stream'
fileExtension='.ful' mimeType='application/octet-stream'
fileExtension='.i' mimeType='application/octet-stream'
fileExtension='.i_z' mimeType='application/octet-stream'
fileExtension='.in_' mimeType='application/octet-stream'
fileExtension='.info' mimeType='application/octet-stream'
fileExtension='.ini' mimeType='application/octet-stream'
fileExtension='.inz' mimeType='application/octet-stream'
fileExtension='.jnlp' mimeType='application/x-java-jnlp-file'
fileExtension='.log' mimeType='text/plain'
fileExtension='.mck' mimeType='application/octet-stream'
fileExtension='.mdk' mimeType='application/octet-stream'
fileExtension='.mdx' mimeType='application/octet-stream'
fileExtension='.md4' mimeType='application/octet-stream'
fileExtension='.nao' mimeType='application/octet-stream'
fileExtension='.ngl' mimeType='application/octet-stream'
fileExtension='.nll' mimeType='application/octet-stream'
fileExtension='.nlo' mimeType='application/octet-stream'
fileExtension='.nmo' mimeType='application/octet-stream'
fileExtension='.ort' mimeType='application/octet-stream'
fileExtension='.out' mimeType='application/octet-stream'
fileExtension='.properties' mimeType='application/octet-stream'
fileExtension='.properties_ux' mimeType='application/octet-stream'
fileExtension='.qtg' mimeType='application/QuestionmarkToGo'
fileExtension='.rck' mimeType='application/octet-stream' fileExtension='.rlt'
mimeType='application/octet-stream' fileExtension='.rvb'
mimeType='application/octet-stream' fileExtension='.ser'
mimeType='application/octet-stream' fileExtension='.spx'
mimeType='application/octet-stream' fileExtension='.sso'
mimeType='application/octet-stream' fileExtension='.swz'
mimeType='application/octet-stream' fileExtension='.tx_'
mimeType='application/octet-stream' fileExtension='.txz'
mimeType='application/octet-stream' fileExtension='.version'
mimeType='application/octet-stream' fileExtension='.we'
mimeType='application/octet-stream' fileExtension='.we_'
mimeType='application/octet-stream' fileExtension='.web'
mimeType='application/octet-stream' fileExtension='.wez'
mimeType='application/octet-stream' fileExtension='.wsl'
mimeType='application/octet-stream' fileExtension='.mp4' mimeType='video/mp4'
fileExtension='.jad' mimeType='text/vnd.sun.j2me.app-descriptor'

fileExtension='.m4a' mimeType='audio/x-m4a' fileExtension='.m4v'

contentType='video/x-m4v'
fileExtension='.rv' mimeType='video/vnd.rn-realvideo'
fileExtension='.icns' mimeType='image/x-icon'
fileExtension='.jnlib' mimeType='application/octet-stream'
fileExtension='.ogv' mimeType='video/ogg' fileExtension='.vtt'
mimeType='text/vtt' fileExtension='.webm'
mimeType='video/webm' fileExtension='.yaml'
mimeType='text/yaml' fileExtension='.*'
mimeType='application/octet-stream'

APPENDIX E: LIST OF ABBREVIATIONS

ADL	Advanced Distributed Learning
AICC	Aviation Industry Computer-Based Training Committee
API	Application Program Interface
ASP	Active Server Pages
AU	Assignable Unit
CDE	Content Delivery Engine
CDET	College of Distance Education and Training
CMS	Content Management System
COTS	Commercial Off-the-Shelf
DCD	Digital Content Department
DLNOC	Distance Learning Network Operations Center
DoD	Department of Defense
DoDI	Department of Defense Instruction
EDL	Electronic Distance Learning
EOC	End of Course
GIF	Graphic Interchange Format
GUI	Graphical User Interface
HHQ	Higher Headquarters
HTML	HyperText Markup Language
HTTP	Hypertext Transfer Protocol
IEEE	Institute of Electrical and Electronics Engineering
ISD	Instructional System Designer
ISP	Internet Service Provider
JPG/JPEG	Joint Photographic Experts Group
JRE	Java™ Runtime Environment
JSP	Java™ Server Pages
LAN	Local Area Network
LMS	Learning Management System
LOM	Learning Object Metadata
LRC	Learning Resource Center
LTSC	Learning Technical Standards Committee
MarineNet	Marine Corps Distance Learning Network
MCEN	Marine Corps Enterprise Network
MCSC	Marine Corps Systems Command
MCU	Marine Corps University
MNCDTS	MarineNet Content Development Technical Standards
MP4	Moving Picture Experts Group Layer-4 Audio
MSA	MarineNet Support Agreement
MSDN	Microsoft® Developer Network
MTESD	Marine Corps Training and Education Standards Division
OTS	Off-the-Shelf
PDF	Portable Document Format
PKI	Public Key Infrastructure
PM	Program Manager
PNG	Portable Network Graphic
QMP	Questionmark® Perception
SCO	Shareable Content Object
SCORM®	Shareable Content Object Reference Model
SME	Subject Matter Expert
SOW	Statement of Work
SSLI	Standard SCO-Level Interface
TECOM	Training and Education Command
URI	Uniform Resource Identifier

USMC
VM
WMA
WMP
WMV
xAPI
XML

United States Marine Corps
Virtual Machine
Windows™ Media Audio
Windows™ Media Player
Windows™ Media Video
Experience Application Program Interface
Extensible Markup Language