

**UNITED STATES GOVERNMENT PRINTING OFFICE
(GPO)**

**PRELIMINARY REQUIREMENTS DOCUMENT
(RD V1.0)**

FOR

COMPOSITION SYSTEM REPLACEMENT (CSR)

FINAL

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1 Introduction

This Preliminary Requirements Document (RD V1.0) defines the requirements for the Composition System Replacement (CSR) and is intended to communicate those requirements to the technical community who will build the system.

The following assumptions were made during the development of this RD:

- Readers of this document are expected to have a basic knowledge of the GPO mission and operations, specifically current GPO composition and production processes. Documents listed in Section 1.4, References, of this RD can provide information helpful in understanding the current Microcomp system and the contents of this document.
- IEEE standard 1233-1998 was used to provide guidance to the development of this RD, but it was adapted as appropriate to the GPO's situation.

1.1 System Purpose

The United States Government Printing Office's (GPO) current composition system is based on a 30-year-old batch composition engine, developed and maintained by GPO, called Microcomp. Microcomp is currently used to compose the majority of Congressional documents and select Federal agency publications that are printed and published electronically by GPO.

Microcomp was originally designed to compose data files with typesetting-specific codes called locators. Locator codes are tied to external format files that specify style attributes to be applied to segments of content. Over the years, approximately 700 related applications and utilities (e.g., translation tools, delivery tools) have been developed to enhance and sustain the Microcomp composition process in response to the evolving needs of GPO's Congressional customers and changing in-house print and electronic access requirements.

In response to Congress' adoption of XML as a data standard, GPO attempted to retrofit Microcomp to compose Standardized General Markup Language (SGML) / Extensible Markup Language (XML), with limited success. Subsequently, Congress sought to improve workflow processes for content creators as well as search and retrieval of data by end users. As a near-term solution, the retrofitting of Microcomp was suspended and GPO decided instead to translate XML files into locator codes for printed publications.

As a long-term strategic decision, GPO has decided to replace the system altogether, a project referred to herein as Composition System Replacement (CSR). The envisioned system will work within GPO's Enterprise Architecture (EA) as well as operating as a stand-alone application deployed remotely at customer sites. The system will be rules-based to facilitate the migration of content into future data tagging schemes/technologies while utilizing industry best practices.

CSR must employ the typographic style and page layout of current printed publications as well as support enhanced search, retrieval, data formats, and repurposing of data, all of which are central to GPO's Future Digital System (FDsys).

This Requirements Document (RD) provides an overview of the proposed CSR. It is a living document that will evolve in collaboration with industry and GPO's stakeholders.

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1.2 System Scope

This application is expected to replace GPO's Microcomp legacy system to meet the evolving needs of GPO's customers and changing technology. CSR will accept content tagged with SGML/XML and ASCII tagged with GPO's legacy locator codes.

The new application(s) will replace all of GPO's current legacy composition applications and their approximately 700 associated support utilities, to comprise a complete, end-to-end composition application including authoring tools and processes, pre-composition processing, composition, WYSIWYG proofing, post-composition processing, and output. CSR will integrate with GPO's FDsys for primary functions including content ingest, content management, workflow, content delivery, and access. CSR will also allow integration with existing Content Originator authoring tools, such as XMetal.

1.3 Definitions, Acronyms and Abbreviations

Appendix A, Acronyms and Glossary contains a complete set of definitions and a list of acronyms used in Composition System Replacement documentation.

1.4 References

The standards, guidelines, and documentation used to support the Composition System Replacement RD.

- IEEE Guide for Developing System Requirements Specifications -Description. IEEE Std. 1233-1998 IEEE Computer Society/Software & Systems Engineering Standards Committee, 1998.
- United States. Congress "Production and Procurement of Printing and Binding" Title 44 U.S. Code, Chapter 5, 2000 edition.
- United States Government Accountability Office. Government Printing Office: Actions to strengthen and sustain GPO's transformation (GAO-04-830). Washington, DC: General Accounting Office, 2004.
- United States. Government Printing Office. Concept of Operations for Composition System Replacement V1.0. 29 November 2006. <<http://www.gpo.gov/CSRConOpsv1.0.pdf>>.
- United States. Government Printing Office. Concept of Operations for the Future Digital System V2.0. 16 May 2005. <http://www.gpo.gov/projects/pdfs/FDsys_ConOps_v2.0.pdf>.
- United States. Government Printing Office. Government Printing Office Style Manual. 2000.
- United States. Government Printing Office. Requirements Document for the Future Digital System V3.0. 18 October 2006. <http://www.gpo.gov/projects/pdfs/FDsys_RD_v3.0.pdf>.
- United States. Government Printing Office. A Strategic Vision for the 21st Century. Washington: U.S. Government Printing Office, 2004. <<http://www.gpo.gov/congressional/pdfs/04strategicplan.pdf>>.
- W3C. "Web content accessibility guidelines 1.0." World Wide Web Consortium. 1999. W3C. 20 March 2006. <<http://www.w3.org/TR/WCAG10/>>.

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1.5 System Overview

CSR will be composed of the necessary technology and business practices to enable GPO to replace or integrate all existing discrete applications, utilities, and processes currently used by GPO and its users to compose and create files optimized for printing and access of select Congressional and Federal agency publications.

CSR will be aligned with GPO's *Strategic Vision for a 21st Century* and the agency's EA. It will also integrate with evolving enterprise-wide systems including GPO's Content Management System (FDsys, <http://www.gpo.gov/projects/fdsys.htm>), Business Information System (Oracle), and Digital Production System, in order to automate many content lifecycle processes, back office functions, and delivery of the content in formats suited to the needs of GPO customers.

CSR will, at a minimum, be capable of delivering files in XML, Postscript, Portable Document Format (PDF), and ASCII with locator codes to support GPO production and customer requirements. The system will also support essential features including line and page numbering, hyphenation, and justification. CSR must be capable of generating sophisticated tables giving the user extensive control over table formats, styles, etc.

CSR will permit data to be reused and repurposed. For example, a table tagged for a report should not have to be retagged in order to include it in the Congressional Record, a bill, or the U.S. Code.

The system must be capable of handling special characters including UTF-8 and entity codes. CSR applications and content must be accessible for all users including those with disabilities and follow best practices and regulations for accessibility (e.g. Section 508, W3C, etc.)

CSR will allow GPO and its users to employ XML while maintaining the current functionality of GPO locator codes. It is assumed that over time users will migrate to the new XML workflow to take advantage of XML's flexibility and robustness.

2 General System Description

In order to meet GPO's strategic goals, the Composition System Replacement must be able to accomplish the following:

- To implement a composition system that utilizes best practices and industry standard data models (e.g., XML)
- To continue to support traditional GPO and customer composition input formats (e.g., locators) until best practices and industry standards are fully adopted
- To support multiple output formats (e.g., PDF, PostScript, XML, locators) as required by GPO and customers
- To support a flexible, consolidated, extensible, scalable, and efficient Production workflow
- To allow necessary updates or to incorporate changes to workflow processes on an as-needed basis as they are developed and implemented
- To achieve alignment with GPO IT strategy and enterprise-wide endeavors such as the Content Management System (FDsys), GPO EA the Business Information System (Oracle), and Digital Production System
- To support the capability for content to be reprocessed in its original format or repurposed as required

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- To provide access to CSR applications and resulting publications to all users, including those with disabilities
- To provide training for GPO and agency users on the new composition system
- To minimize disruption of customer and GPO processes

2.1 System Context

The Composition Replacement System will be implemented in the context of GPO's strategic goals, existing GPO processes, and legacy systems.

2.1.1 Proposed System Attributes

The system will accept XML and locator code input, thereby eliminating the need for separate conversion programs for each publication database.

The system will output XML for optimal search/retrieval/repurposing in FDsys, Postscript/PDF/HTML to support customer printing/electronic display requirements, and locators to provide a uniform distribution format during the transition of authoring from locators to XML.

The system will align with GPO's EA and interface with FDsys, and other existing pre- and post-processing applications. The system will be based on an XML data model to enable support, maintenance, and development outside of GPO.

The system must possess the following attributes:

- **Modularity.** Ability to use plug-in components that can be replaced with minimal impact to remaining components as workload and technology change;
- **Scalability.** Capable of accommodating increasing volumes of content;
- **Extensibility.** Ability to handle additional file formats over time, not limited to specific types that exist today;
- **Comprehensiveness.** Accept, process, and output a variety of file formats as outlined in this RD;
- **Flexibility.** Enable GPO to tailor content-based services to suit its customers' needs and enable GPO to implement progressive improvements in its business process over time; and
- **Accessibility.** Employ software and create output compliant with Section 508 of the Rehabilitation Act.

2.1.2 Proposed System Capabilities

To meet strategic objectives, the new system will need to:

- Accept XML and locator code input.
- Output XML, Postscript, PDF, HTML, locators.
- Support existing and new style formats.
- Support long-term phase-out of locators for input and output.
- Automate existing workflows and processes.

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- Track jobs throughout the composition process.
- Support batch processing of content.
- Support system security.
- Manage upgrades to software.
- Provide audit trails and logs of system activity.
- Align with agency IT strategy and GPO's EA

2.2 Major System Conditions

A list of general high-level Conditions:

- Responsiveness to user needs
- System flexibility
- System scalability
- System interoperability
- Standards compliance

2.3 Major System Constraints

The proposed composition system will support GPO operational policies as well as future changes to policy.

Constraints that may have an impact on system design are:

- Composition system design must interface with or support FDsys
- System must be designed and implemented in accordance with the strategic technology and architecture decisions of the GPO EA
- Implementation of CSR will need to be consistent with the GPO Information Assurance Security Policy, with special consideration given to the operational access to system data to various GPO personnel
- The system will allow integration with current customer authoring and composition workflow processes (e.g., House and Senate customized Xmetal authoring tools) to cause minimal disruption
- The system will be implemented within current funding and resource allocations
- CSR will adhere to all applicable laws and regulations (e.g., Section 508)
- Users of the proposed system will need to be trained
- CSR will need to be operated both as a composition server and as a stand-alone desktop application

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2.4 User Characteristics

The following subsections describe the organizational structure and the classes of users, including user capabilities, which are associated with the proposed system.

PROFILES OF USER CLASSES

Content Originators (Congressional & Federal Agency customers) will:

- Create content
- Submit content, or make content available, to GPO
- Keyboard operations, including the initial entry of content and tagging as well as corrections
- Mark-up and copy preparation operations
- Optical Character Recognition (OCR) scanning of manuscript
- Scanning of graphics
- File translations
- Soft and hard copy proofing
- Composition generation of page output

Composition Operators (Congressional & Federal Agency customers, Pre-Press Divisions: Keyboard, Markup, Proofroom) will perform:

- Keyboard operations, including the initial entry of content and tagging as well as corrections
- Mark-up and copy preparation operations
- OCR scanning of manuscript
- Scanning of graphics
- File translations
- Soft and hard copy proofing
- Composition generation of both galley and page output

ADMINISTRATIVE AND SUPPORT PERSONNEL

Formatting and Style Sheet Developers in the Graphic Systems Development Division (GSDD) will perform:

- DTD and/or Schema design
- Style sheet and format development (publication specific setting and processes)
- XSLT development
- Pi font development

Composition System Administrators (GSDD, Text Processing) will:

- Develop publication specific automated workflows including both pre and post composition processes
- Administer the batch operation of composition servers, automated processes and print queues
- Manage rollout/rollback of new system components
- Composition Application Support (first level)

Information Technology & Systems (IT&S) will perform:

- User Support/Help desk operations
- Change/configuration management
- Maintain and administer servers and network connections

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2.5 Operational Scenarios

A scenario is a step-by-step description of how the system should operate and interact with both its users and external interfaces under a given set of circumstances. Scenarios are described in a manner that enables readers to walk through them and gain an understanding of how all the principal parts of the system function and interact. The scenarios tie together all parts of the system, the users, and other entities by describing how they interact. Scenarios cover the user's concept of all the operational modes and all classes of users identified for the proposed system and illustrate all the business processes that the system will support.

CONTENT ORIGINATOR SCENARIOS

Scenario: External Content Originator using XML Authoring Tool

- Create and tag content using text editors or authoring tools that generate XML
- Use CSR to generate proofs
- Make corrections and modifications to content based on proofs
- Approve content for printing
- Submit content to GPO
- Receive or retrieve files from GPO after print production
- Use content received from GPO to create new versions of content

Scenario: External Content Originator using Word Processing Software

- Create content using word processing software
- Use word processing program to generate proofs
- Make corrections and modifications to content based on proofs
- Approve content for printing
- Submit content to GPO for formatting

Scenario: External Content Originator using Xywrite or Textpad

- Create and tag content with GPO locators using Xywrite or Textpad
- Use CSR to generate proofs
- Make corrections and/or modifications to content based on proofs
- Approve content for printing
- Submit content to GPO
- Receive or retrieves files from GPO after print production
- Use content received from GPO to create new versions of content

Scenario: External Content Originator Submitting Manuscript

- Gather manuscript from various sources where electronic files are not available
- Submit manuscript or camera copy to GPO for keying-in and formatting
- Receive and approve proofs for publication

Scenario: External Content Originator Tagging Content with HTML

- Create and tag content as HTML
- Notify GPO of location of content on Web site so GPO can download and format
- Receive and approve proofs for publication

Note: an individual job may involve multiple Content Originator Scenarios listed above.

COMPOSITION OPERATOR SCENARIOS

Scenario: Composition Operators

- Receive content from Content Originator(s)
- Identify publication type (e.g., Congressional Bill) and publication (e.g., HR 3618)
- Identify current tagging format (e.g., ASCII, Word Processor)
- Identify desired tagging format (e.g., XML)
- Translate tagging format if required (e.g., locators or SGML into XML) using CSR
- Manually apply additional tagging as needed
- Use CSR to generate proofs in galley and page format
- Review and edit formatting
- CSR generates and delivers final versions in PostScript, XML, and native document format

Process Variations and Exception Processes for Manuscript:

- Markup of manuscript with tag locations
- Keyboard operations, including the initial entry of content and tagging as well as corrections
- OCR scanning and automated or manual tagging of manuscript

Scenario: Formatting and Style Sheet Developers

- Develop or modify DTDs and Schema for use by CSR and authoring tools
- Use CSR to develop or modify publication specific settings and processes for use by CSR and authoring tools
- Develop or modify XSLTs for translating from one version of XML to another
- Use CSR to develop or modify XSL style sheets to render XML files within a browser
- Develop or modify Pi fonts for special characters

Scenario: Composition System Administrators

- Use CSR workflow tools to develop and modify publication specific automated workflows including both pre- and post-composition processes
- Administer the batch operation of composition servers, automated processes, and print queues
- Manage rollout/rollback of new system components
- Composition application support

Scenario: Information Technology & Systems (IT&S)

- Perform user support/help desk operations
- Change and configuration management
- Maintain and administer servers, network connections, and hardware

3 Requirements

3.1 Assumptions

The following form the assumptions as currently known for the Composition Replacement System.

- The CSR data tagging model will be SGML/XML based.
- The CSR will provide support of locators either directly or through translation.

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- The CSR will interface with the Future Digital System (FDsys).
- The system will conform to best practices for usability and accessibility.
- The system will be flexible, extensible, and adaptable.
- Manual tools and processes may be required into the foreseeable future.
- CSR implementation will require extensive training of both internal and external users.

3.2 Requirements List

The requirements listed in this section are the result of a thorough analysis of the ideas proposed in the current version of the *Composition System Replacement ConOps*. The requirements are organized into logical areas of functionality. This RD should be reviewed together with the *ConOps* for a complete understanding of the proposed system.

There are several levels of system requirements in each major system capability. Each subsection is hierarchical in nature; these relationships are reflected in the ID codes.

Each requirement features the attribute of Criticality.

- **Must:** The system cannot adequately function without meeting this requirement.
- **Should:** Functionality system users will expect. These requirements are desirable features that will be implemented whenever possible.
- **Could:** Additional functionality that is not critical to the system function or user experience.

3.2.1 General System Requirements

- 3.2.1.1 The system shall compose data into formatted pages. **Must**
 - 3.2.1.1.1 The system shall compose data into formatted pages for print output. **Must**
 - 3.2.1.1.2 The system shall compose data into formatted pages for Web output. **Must**
- 3.2.1.2 The system shall provide the capability to be operated as a composition server. **Must**
- 3.2.1.3 The system shall provide the capability to be operated as a stand-alone desktop application. **Must**

3.2.2 Input Data

The Composition System Replacement (CSR) will be the central point for composition of content that is intended for in-house print and electronic output. The system will have the capability to accept input data for composition in all formats that are submitted by users. These formats include but are not limited to XML, SGML, XML/SGML hybrids, Locator Files, and hybrids. These formats also encompass requirements that pertain to tables and document fragments (e.g., SGML/XML subtrees). Regardless of the type of input data that is submitted, CSR will have the capability to compose input data into formatted pages.

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- 3.2.2.1 The system shall accept SGML formatted files. Must
- 3.2.2.2 The system shall accept XML formatted files. Must
- 3.2.2.3 The system shall accept formatted files containing a combination of SGML and XML. Must
- 3.2.2.4 The system shall accept ASCII files tagged with locators. Must
- 3.2.2.5 The system shall accept table content structured using table models. Must
 - 3.2.2.5.1 The system shall accept table content structured using SGML translation. Must
 - 3.2.2.5.2 The system shall accept table content structured using the SGML representation of locator based tables. Must
 - 3.2.2.5.3 The system shall accept table content structured using extended CALS. Must
- 3.2.2.6 The system shall provide the capability to accept fragments of content as XML/SGML subtrees. Must

3.2.3 Content and Processing

In order to be a successful composition system replacement for GPO, the system must support many different types of printed publications published by Content Originators, including Congress and Federal Agencies. These printed publications are comprised of many different document components that must be supported by CSR, including the following:

- Text
- Tables
- Graphics and Equations
- Continuation Indicators
- Indices (Indexes)
- Table of Contents
- Side Notes

Publication text is the main type of document component. Text is often output as two or more columns on a single page, and CSR must support these requirements.

Many publications that are composed for print by GPO include tables within their content. The system will support the composition of tables as required by Content Originators, including all formatting and display requirements that pertain to individual tables.

Graphics and equations, especially in the cases of the Federal Register and Code of Federal Regulations, are also common content that must be composed.

Many publications currently composed by GPO require Continuation Indicators, which are indicators that a document component has been continued from one page to the next or from one column to the next (e.g., running headers and table headers containing the word “continued”). Continuation Indicators can be either dynamic or static, and can apply to text, tables, endnotes, footnotes, or pages.

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CSR must also have the capability to support the creation of indices (indexes) and Table of Contents for publications. These may have already been created within the original submitted content, or may be generated by the CSR.

Printed publications such as Public and Private Laws require the composition of Side Notes, which denote cross-references to sections of other publications. CSR must have the capability to output Side Notes at specified locations within the text.

- 3.2.3.1 The system shall support composition of tables. Must
 - 3.2.3.1.1 The system shall support composition of tables within a text column. Must
 - 3.2.3.1.2 The system shall support composition of tables across text columns. Must
 - 3.2.3.1.3 The system shall support composition of tables within a page. Must
 - 3.2.3.1.4 The system shall support composition of tables across pages. Must
 - 3.2.3.1.5 The system shall provide the capability to automatically size tables based on table properties (e.g., column widths) and document properties (e.g., page margins). Must
 - 3.2.3.1.6 The system shall provide the capability to automatically rotate (portrait, landscape) tables based on table properties (e.g., column widths) and document properties (e.g., page layout). Must
 - 3.2.3.1.7 The system shall provide the capability to compose multiple levels of headings and sub-headings for tables. Must
 - 3.2.3.1.7.1 The system shall provide the capability to compose repeating headings and sub-headings for tables that continue across pages. Must
 - 3.2.3.1.7.2 The system shall provide the capability to select column heading preferences for tables composed across pages (e.g., column headings appear only on even pages)
 - 3.2.3.1.7.3 The system shall provide the capability to add continuation indicators to table headings that span multiple pages. Must
 - 3.2.3.1.8 The system shall provide the capability to produce columns with headers within tables. Must
 - 3.2.3.1.8.1 The system shall provide the capability to produce columns with repeating headers within tables. Must
 - 3.2.3.1.8.2 The system shall provide the capability to align headers in columns within tables. Must

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- 3.2.3.1.8.2.1 The system shall provide the capability to left align headers in columns within tables. Must
- 3.2.3.1.8.2.2 The system shall provide the capability to right align headers in columns within tables. Must
- 3.2.3.1.8.2.3 The system shall provide the capability to center headers in columns within tables. Must
- 3.2.3.1.8.2.4 The system shall provide the capability to justify headers in columns within tables. Must
- 3.2.3.1.8.2.5 The system shall provide the capability to align headers in columns within tables on a special character (e.g., decimal point, parenthesis). Must
- 3.2.3.1.8.3 The system shall provide the capability to rotate table headers to read vertically or at an angle with a horizontal table. Must
- 3.2.3.1.8.4 The system shall provide the capability to rotate table headers to read horizontally or at an angle with a vertical table. Must
- 3.2.3.1.9 The system shall provide the capability to align table columns. Must
 - 3.2.3.1.9.1 The system shall provide the capability to left align table columns. Must
 - 3.2.3.1.9.2 The system shall provide the capability to right align table columns. Must
 - 3.2.3.1.9.3 The system shall provide the capability to center table columns. Must
 - 3.2.3.1.9.4 The system shall provide the capability to justify table columns. Must
 - 3.2.3.1.9.5 The system shall provide the capability to align table columns on a special character (e.g., decimal point, parenthesis).
- 3.2.3.1.10 The system shall provide the capability to align text within a table.
 - 3.2.3.1.10.1 The system shall provide the capability to left align text within a table. Must
 - 3.2.3.1.10.2 The system shall provide the capability to right align text within a table. Must
 - 3.2.3.1.10.3 The system shall provide the capability to center text within a table. Must
 - 3.2.3.1.10.4 The system shall provide the capability to justify text within a table. Must

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- 3.2.3.1.10.5 The system shall provide the capability to align text within a table on a special character (e.g., decimal point, parenthesis). Must
- 3.2.3.1.11 The system shall provide the capability to apply customized widow and orphan control to tables. Must
 - 3.2.3.1.11.1 The system shall provide default table breaks so that each table has at least two rows of data on the starting page and at least three rows of data on the ending page. Must
 - 3.2.3.1.11.1.1 The system shall move tables to the next page when the header and two rows of data will not fit on the starting page. Must
 - 3.2.3.1.11.2 The system shall provide the capability to accept manually entered table breaks. Must
 - 3.2.3.1.11.3 The system shall provide the capability to add footnotes at each table break. Must
 - 3.2.3.1.11.3.1 The system shall provide the capability to repeat footnotes at each table break. Must
 - 3.2.3.1.12 The system shall support table footnotes. Must
 - 3.2.3.1.12.1 The system shall support both table and text footnotes within the same page. Must
 - 3.2.3.1.13 The system shall allow users to specify table settings (e.g., table size, table alignment, table headers). Must
 - 3.2.3.1.13.1 The system shall allow users to specify default table settings (e.g., table size, table alignment, table headers) for publication types. Must
 - 3.2.3.1.13.2 The system shall allow users to create and save custom table settings. Must
 - 3.2.3.1.13.2.1 The system shall allow users to apply custom table settings to publications. Must
 - 3.2.3.1.13.3 The system shall provide the capability to modify table settings. Must
 - 3.2.3.1.13.4 The system shall provide the capability to override table settings. Must
 - 3.2.3.1.14 The system shall provide the capability to carry over a specific tag within a table from page to page. Must
 - 3.2.3.2 The system shall support composition of columns of text. Must
 - 3.2.3.2.1 The system shall provide the capability to produce columns with headings. Must

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- 3.2.3.2.1.1 The system shall provide the capability to compose columns with repeating headings. Must
- 3.2.3.2.1.2 The system shall provide the capability to align headings in columns. Must
 - 3.2.3.2.1.2.1 The system shall provide the capability to left align headings in columns. Must
 - 3.2.3.2.1.2.2 The system shall provide the capability to right align headings in columns. Must
 - 3.2.3.2.1.2.3 The system shall provide the capability to center headings in columns. Must
 - 3.2.3.2.1.2.4 The system shall provide the capability to justify headings in columns. Must
- 3.2.3.2.1.3 The system shall provide the capability to span headings across columns. Must
- 3.2.3.2.1.4 The system shall provide the capability to apply variable styles for headings depending on how many lines of type they make (e.g., 2 lines or less are centered while 3 or more line are flush and hang). Must
- 3.2.3.2.2 The system shall provide the capability to align columns. Must
 - 3.2.3.2.2.1 The system shall provide the capability to left align columns. Must
 - 3.2.3.2.2.2 The system shall provide the capability to right align columns. Must
 - 3.2.3.2.2.3 The system shall provide the capability to center columns. Must
 - 3.2.3.2.2.4 The system shall provide the capability to justify columns. Must
- 3.2.3.2.3 The system shall provide the capability to align text within a column. Must
 - 3.2.3.2.3.1 The system shall provide the capability to left align text within a column. Must
 - 3.2.3.2.3.2 The system shall provide the capability to right align text within a column. Must
 - 3.2.3.2.3.3 The system shall provide the capability to center text within a column. Must
 - 3.2.3.2.3.4 The system shall provide the capability to justify text within a column. Must

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- 3.2.3.2.3.5 The system shall provide the capability to align text on a given variable location. Must
- 3.2.3.2.4 The system shall support up to six sub-columns of text within a single column. Must
- 3.2.3.2.5 The system shall provide the capability to vertically justify columns such that all the columns within a common container (e.g., page body) start and end at the same horizontal position of the page. Must
- 3.2.3.2.6 The system shall provide the capability to specify column settings (e.g., column width, column headers). Must
 - 3.2.3.2.6.1 The system shall provide the capability to set default column settings (e.g., column width, column headers). Must
 - 3.2.3.2.6.2 The system shall provide the capability for users to create and save custom column settings (e.g., column width, column headers). Must
 - 3.2.3.2.6.2.1 The system shall provide the capability for users to apply custom column settings to publications. Must
 - 3.2.3.2.6.3 The system shall provide the capability to modify column settings. Must
 - 3.2.3.2.6.4 The system shall provide the capability to override column settings. Must
- 3.2.3.2.7 The system shall provide the capability to switch between the number of columns within a page. Must
- 3.2.3.2.8 The system shall provide the capability to wrap column text around images. Must
- 3.2.3.2.9 The system shall provide the capability to adjust column size (e.g., width, gutter, margins). Must
- 3.2.3.3 The system shall support composition of footnotes in columns of text. Must
 - 3.2.3.3.1 The system shall provide the capability to compose footnote identifiers.
 - 3.2.3.3.1.1 The system shall provide the capability to compose sequential, numeric footnotes. Must
 - 3.2.3.3.1.2 The system shall provide the capability to compose symbolic footnote patterns (e.g., asterisks, daggers). Must
 - 3.2.3.3.1.3 The system shall provide the capability to reset footnote identifiers at structural and page boundaries (e.g., start of new sections, chapters). Must

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- 3.2.3.3.1.4 The system shall provide the capability to continue footnote identifiers incrementally across structural and page boundaries (e.g., start of new sections, chapters). Must
- 3.2.3.3.1.5 The system shall provide the capability to set the initial footnote identifier as a publication setting. Must
- 3.2.3.3.1.6 The system shall provide the capability to manually set the initial footnote identifier at the time of composition. Must
- 3.2.3.3.1.7 The system shall provide the capability to override auto-generation of footnote identifiers and use an identifier contained in the data file. Must
- 3.2.3.3.2 The system shall provide the capability to compose footnotes at the end of a chapter or similar structural boundary. Must
- 3.2.3.3.3 The system shall provide the capability to begin a footnote in the column in which its reference occurs. Must
- 3.2.3.3.4 The system shall provide the capability to begin a footnote on the same page in which its reference occurs. Must
- 3.2.3.3.5 The system shall provide the capability to compose footnotes for individual columns within a multi-column layout. Must
- 3.2.3.3.6 The system shall provide the capability to compose footnotes that span across multiple columns. Must
- 3.2.3.3.7 The system shall provide the capability to compose footnotes that continue from one column to another column. Must
- 3.2.3.3.8 The system shall provide the capability to compose footnotes that continue from one page to another page. Must
- 3.2.3.3.9 The system shall provide the capability to compose footnotes that occupy an entire page or column. Must
- 3.2.3.3.10 The system shall provide the capability to include tables, equations, and graphics within footnotes. Should
- 3.2.3.3.11 The system shall provide the capability to compose continuation indicators below the last line of the footnote where the break occurs on an odd numbered page. Must
- 3.2.3.3.12 The system shall provide the capability to end a footnote in a column in which its reference does not occur. Must
- 3.2.3.3.13 The system shall provide the capability to evenly distribute footnotes in all columns on a page (i.e. to take up the least amount of space at the bottom of the page). Must
- 3.2.3.4 The system shall provide the capability to compose documents with graphics and equations. Must

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- 3.2.3.4.1 The system shall provide the capability to compose documents with both embedded and linked graphics and equations. Must
 - 3.2.3.4.1.1 The system shall provide the capability to compose documents with embedded graphics. Must
 - 3.2.3.4.1.2 The system shall provide the capability to compose documents with embedded equations. Must
 - 3.2.3.4.1.3 The system shall provide the capability to compose documents with linked graphics. Must
 - 3.2.3.4.1.4 The system shall provide the capability to compose documents with linked equations. Must
 - 3.2.3.4.1.5 The system shall provide the capability of retrieving linked graphics. Must
 - 3.2.3.4.1.5.1 The system shall provide the capability of retrieving linked graphics from a common location that can be specified at rendition time. Must
 - 3.2.3.4.1.5.2 The system shall provide the capability of retrieving linked graphics from arbitrary locations specified in the input document. Must
 - 3.2.3.4.1.6 The system shall provide the capability of retrieving linked equations. Must
 - 3.2.3.4.1.6.1 The system shall provide the capability of retrieving linked equations from a common location that can be specified at rendition time. Must
 - 3.2.3.4.1.6.2 The system shall provide the capability of retrieving linked equations from arbitrary locations specified in the input document. Must
 - 3.2.3.4.1.7 The system shall provide the capability of specifying a common location for graphics and equations within a specific publication's rules and settings. Must
 - 3.2.3.4.1.7.1 The system shall provide the capability to locate graphics and equations in a common location based on the file name. Must
- 3.2.3.4.2 The system shall provide the option of printing the filename/path of a graphic or equation at the edge of the page outside the trimmed page edge. Should
- 3.2.3.4.3 The system shall provide the capability to output a document without graphics or equations. Must

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- 3.2.3.4.3.1 The system shall provide the capability to retain appropriate space where the graphic or equation would physically reside and the exact space it would have occupied on the page. Must
- 3.2.3.4.3.2 The system shall provide the capability to display an identifier or filename in the space where the graphic or equation would otherwise be. Must
- 3.2.3.4.4 The system shall provide the capability to automatically and manually size graphics and equations based on document properties (e.g., column width, page margins). Must
- 3.2.3.4.5 The system shall provide the capability to rotate graphics and equations at a minimum of 90 degree increments. Must
- 3.2.3.4.6 The system shall provide the capability to position graphics and equations anywhere on a page. Must
 - 3.2.3.4.6.1 The system shall provide the capability to position graphics and equations on the next new text line. Must
 - 3.2.3.4.6.2 The system shall provide the capability to position graphics and equations on the next new column. Must
 - 3.2.3.4.6.3 The system shall provide the capability to position graphics and equations on the next new page. Must
 - 3.2.3.4.6.4 The system shall provide the capability to position graphics and equations on the next new even page. Must
 - 3.2.3.4.6.5 The system shall provide the capability to position graphics and equations on the next new odd page. Must
 - 3.2.3.4.6.6 The system shall provide the capability to position graphics and equations within a line of text. Must
 - 3.2.3.4.6.7 The system shall provide the capability to position graphics and equations between characters. Must
 - 3.2.3.4.6.8 The system shall provide the capability to position graphics and equations before and after graphics. Must
 - 3.2.3.4.6.9 The system shall provide the capability to position graphics and equations before and after equations. Must
 - 3.2.3.4.6.10 The system shall provide the capability to position graphics and equations before and after tables. Must
 - 3.2.3.4.6.11 The system shall provide the capability to position graphics and equations within tables. Must
 - 3.2.3.4.6.12 The system shall provide the capability to position graphics and equations within footnotes. Must

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- 3.2.3.4.7 The system shall provide the capability to align graphics within columns and pages. Must
 - 3.2.3.4.7.1 The system shall provide the capability to left align graphics within columns and pages. Must
 - 3.2.3.4.7.2 The system shall provide the capability to right align graphics within columns and pages. Must
 - 3.2.3.4.7.3 The system shall provide the capability to center graphics within columns and pages. Must
- 3.2.3.4.8 The system shall provide the capability to align equations within columns and pages. Must
 - 3.2.3.4.8.1 The system shall provide the capability to left align equations within columns and pages.
 - 3.2.3.4.8.2 The system shall provide the capability to right align equations within columns and pages.
 - 3.2.3.4.8.3 The system shall provide the capability to center equations within columns and pages.
- 3.2.3.4.9 The system shall support EPS graphics and equations. Must
- 3.2.3.4.10 The system shall support PDF graphics and equations. Must
- 3.2.3.4.11 The system shall support JPEG graphics and equations. Must
- 3.2.3.4.12 The system shall support TIF graphics and equations. Must
- 3.2.3.4.13 The system shall support XML graphics and equations (e.g., MathML). Must
- 3.2.3.4.14 The system shall provide the capability of applying scotch rules (e.g., border around a graphic or equation). Must
- 3.2.3.4.15 The system shall provide the capability to wrap text around a graphic or equation. Must
 - 3.2.3.4.15.1 The system shall provide the capability to set preferences for text wrapping. Must
 - 3.2.3.4.15.1.1 The system shall provide the capability to set preferences for type of wrap. Must
 - 3.2.3.4.15.1.2 The system shall provide the capability to set preferences for space between a graphic and text. Must
 - 3.2.3.4.15.1.3 The system shall provide the capability to set preferences for space between an equation and text. Must

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3.2.3.4.16 The system shall provide the capability to wrap text around a heading (i.e. cut-in). Must

3.2.3.5 The system shall generate continuation indicators (e.g., running headers, table headers, the word "continued"). Must

3.2.3.5.1 The system shall support manually entered continuation indicators (e.g., static headers and footers). Must

3.2.3.5.2 The system shall generate dynamic continuation indicators from content sources. Must

3.2.3.5.2.1 The system shall generate dynamic continuation indicators from Parts. Must

3.2.3.5.2.2 The system shall generate dynamic continuation indicators from Sub-parts. Must

3.2.3.5.2.3 The system shall generate dynamic continuation indicators from Footnotes. Must

3.2.3.5.2.4 The system shall generate dynamic continuation indicators from Titles. Must

3.2.3.5.2.5 The system shall generate dynamic continuation indicators from Sections. Must

3.2.3.5.2.6 The system shall generate dynamic continuation indicators from Chapters. Must

3.2.3.5.2.7 The system shall generate dynamic continuation indicators from Volumes. Must

3.2.3.5.3 The system shall provide the capability of generating continuation indicators for footnotes (e.g., the word "continued") that continue from column to column. Must

3.2.3.5.4 The system shall provide the capability of generating continuation indicators for footnotes (e.g., the word "continued") that continue from page to page. Must

3.2.3.5.5 The system shall provide the capability of generating continuation indicators for table titles (e.g., the word "continued") that continue from column to column. Must

3.2.3.5.6 The system shall provide the capability of generating continuation indicators for table titles (e.g., the word "continued") that continue from page to page. Must

3.2.3.5.7 The system shall provide the capability to generate a minimum of five levels (i.e. indentations) of continuation indicators (e.g., running headers) for text that continues from column to column. Must

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- 3.2.3.5.8 The system shall provide the capability to generate a minimum of five levels (i.e. indentations) of continuation indicators (e.g., running headers) for text that continues from page to page. Must
- 3.2.3.5.9 The system shall provide the capability of generating continuation indicators that continue from an odd page to an even page. Must
- 3.2.3.5.10 The system shall provide the capability to repeat headers for rotated tables on even pages. Must
- 3.2.3.6 The system shall provide the capability to dynamically generate an index from content and associated page number(s). Must
 - 3.2.3.6.1 The system shall provide the capability to control how much data is used in the index. Must
 - 3.2.3.6.2 The system shall provide the capability to allow manual tagging of index terms. Must
 - 3.2.3.6.2.1 The system shall provide the capability to add summaries to index terms. Must
- 3.2.3.7 The system shall provide the capability to dynamically generate a table of contents from content and associated page number(s). Must
 - 3.2.3.7.1 The system shall provide the capability to dynamically generate table of contents lists (e.g., figures, appendices) from content and associated page number(s). Must
- 3.2.3.8 The system shall provide the capability to automatically generate outlines. Should
- 3.2.3.9 The system shall provide the capability to automatically generate headers. Must
 - 3.2.3.9.1 The system shall provide the capability to generate running headers (i.e. headers identical to multiple pages). Must
 - 3.2.3.9.2 The system shall provide the capability to generate headers that contain an automatically generated folio (e.g., page number). Must
 - 3.2.3.9.2.1 The system shall provide the capability to override the default starting number of a folio. Must
 - 3.2.3.9.2.2 The system shall provide the capability to suppress printing of folios based on publication specific style settings. Must
 - 3.2.3.9.2.3 The system shall provide the capability to position folios based on publication specific style settings and processing instructions. Must
 - 3.2.3.9.2.4 The system shall support multiple folios (e.g., i, 1, A) in various locations within the same publication. Must

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- 3.2.3.9.2.5 The system shall provide the capability to begin pagination on a new odd page number.
- 3.2.3.9.2.6 The system shall provide the capability to begin pagination on a new even page number.
- 3.2.3.10 The system shall provide the capability to automatically generate footers. Must
 - 3.2.3.10.1 The system shall provide the capability to generate running footers (i.e. footers identical to multiple pages). Must
 - 3.2.3.10.2 The system shall provide the capability to generate footers that contain an automatically generated folio (e.g., page number). Must
 - 3.2.3.10.2.1 The system shall provide the capability to override the default starting number of a folio. Must
 - 3.2.3.10.2.2 The system shall provide the capability to suppress printing of folios based on publication specific style settings and processing instructions. Must
 - 3.2.3.10.2.3 The system shall provide the capability to position folios based on publication specific style settings and processing instructions. Must
 - 3.2.3.10.2.4 The system shall support multiple folios (e.g., i, 1, A) in various locations within the same publication. Must
 - 3.2.3.10.2.5 The system shall provide the capability to begin pagination on a new odd page number.
 - 3.2.3.10.2.6 The system shall provide the capability to begin pagination on a new even page number.
- 3.2.3.11 The system shall enable the creation of side notes that are automatically placed in the outside margin of the current page. Must
 - 3.2.3.11.1 The system shall provide the capability to vertically align side notes with reference data (e.g., in public laws). Must
 - 3.2.3.11.2 The system shall allow structured tagging of side notes so that they can be extracted and linking relationships can be established to other documents. Must

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3.2.4 Character Formatting

Printed publications composed by GPO often require specific formatting of characters, text, tables, and columns. Specifically, CSR will support the following format functions:

- Change formatting
- Font styling
- Text alignment
- Tracking
- Adjusting of character width
- Kerning
- Drop Caps and Raised Caps
- Special and Unicode Characters
- Composite Characters
- Leaders
- Horizontal and Vertical Fixed Spacing

- 3.2.4.1 The system shall support automatic formatting of text. Must
- 3.2.4.2 The system shall support manual formatting of text. Must
- 3.2.4.3 The system shall provide the capability to change the formatting of selected data. Must
 - 3.2.4.3.1 The system shall provide the capability to point size of selected data. Must
 - 3.2.4.3.2 The system shall provide the capability to change the typeface of selected data. Must
 - 3.2.4.3.3 The system shall provide the capability to change the font style of selected data. Must
 - 3.2.4.3.4 The system shall provide the capability to change the font of selected data. Must
 - 3.2.4.3.5 The system shall provide the capability to change the leading of selected data. Must
 - 3.2.4.3.6 The system shall provide the capability to change the paragraph leading of selected data. Must
 - 3.2.4.3.7 The system shall provide the capability to change the indentation of selected data. Must
 - 3.2.4.3.8 The system shall provide the capability to change the carding (i.e. vertical justification) of selected data. Must
 - 3.2.4.3.9 The system shall provide the capability to change the text color of selected data. Must
 - 3.2.4.3.10 The system shall provide the capability to change the background color of selected data. Must

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- 3.2.4.4 The system shall provide the capability to create superscripts. Must
- 3.2.4.5 The system shall provide the capability to create subscripts. Must
- 3.2.4.6 The system shall provide the capability to align text. Must
 - 3.2.4.6.1 The system shall provide the capability to ragged left align text. Must
 - 3.2.4.6.2 The system shall provide the capability to ragged right align text. Must
 - 3.2.4.6.3 The system shall provide the capability to center text. Must
 - 3.2.4.6.4 The system shall provide the capability to justify text. Must
 - 3.2.4.6.5 The system shall provide the capability to force justification of short lines of text. Must
 - 3.2.4.6.6 The system shall provide the capability to align text on a special character (e.g., decimal point, parenthesis). Must
- 3.2.4.7 The system shall support tracking of text characters. Must
- 3.2.4.8 The system shall provide the capability to manually adjust character widths without changing character height. Must
- 3.2.4.9 The system shall support Postscript Type1 Fonts. Must
- 3.2.4.10 The system shall provide the capability of character kerning. Must
- 3.2.4.11 The system shall provide the capability of supporting Drop Caps. Must
- 3.2.4.12 The system shall provide the capability of supporting Raised Caps. Must
- 3.2.4.13 The system shall provide the capability of supporting Brackets. Must
- 3.2.4.14 The system shall support the use of special characters (e.g., fat dashes, dingbats, symbols). Must
- 3.2.4.15 The system shall provide the capability to render Unicode characters outside the base ASCII range (characters above 255). Must
 - 3.2.4.15.1 The system shall support the use of Unicode characters for special characters and punctuation (e.g., accent marks). Must
- 3.2.4.16 The system shall enable the ability to compose glyphs that are composed of a base character, an accent (grave accent, over-dot, over-ring, etc.), and another character, such as an over-bar, tilde, etc. such that the same combination of glyphs can be constructed using any base font (as opposed to creating a special-purpose font with these glyphs). Must
- 3.2.4.17 The system shall provide the capability to compose using fonts with composite characters (i.e. a base character and an accent or other glyph). Must

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- 3.2.4.18 The system shall support automatic placement of leaders within text columns and tables. Must
- 3.2.4.19 The system shall support manual placement of leaders within text columns and tables. Must
- 3.2.4.20 The system shall provide the capability to insert fixed horizontal spacing (e.g.,em space, en space, thin space, decimal unit value) within a page. Must
- 3.2.4.21 The system shall provide the capability to delete fixed horizontal spacing (e.g.,em space, en space, thin space, decimal unit value) within a page. Must
- 3.2.4.22 The system shall provide the capability to insert fixed vertical spacing (e.g., override built-in leading in heads) within a page. Must
- 3.2.4.23 The system shall provide the capability to delete fixed vertical spacing (e.g., override built-in leading in heads) within a page. Must
- 3.2.4.24 The system shall provide the capability to force a word to break to the next line. Must
- 3.2.4.25 The system shall provide the capability to force a line to break to the next page. Must

3.2.5 Layout

CSR will need to conform to distinctive formatting requirements for documents that are printed by GPO, including but not limited to the Congressional Record, Congressional Bills, and Federal Register.

Specifically, the system will have the capability to:

- Automate the placement of content within a publication
- Use publication specific settings during composition
- Apply multiple sets of publication specific settings to the same document (e.g., same data used in the Federal Register and Code of Federal Regulations)
- Override publication specific settings

3.2.5.1 The system shall allow users to adjust format settings to match the format of existing documents produced by GPO (e.g., Congressional Record, Congressional Bills, Federal Register, committee reports and hearings). Must

3.2.5.2 The system shall provide the capability to generate rules (lines). Must

3.2.5.2.1 The system shall provide the capability to place rules (lines) anywhere on a page. Must

3.2.5.2.1.1 The system shall provide the capability to manually place rules (lines). Must

3.2.5.2.1.2 The system shall provide the capability to place rules (lines) based upon publication specific style settings and processing instructions. Must

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- 3.2.5.2.2 The system shall provide the capability to generate rules (e.g., vertical lines, horizontal lines, bordering lines) for columns. Must
 - 3.2.5.2.2.1 The system shall provide the capability to generate rules (e.g., vertical lines, horizontal lines, bordering lines) within a column. Must
 - 3.2.5.2.2.2 The system shall provide the capability to generate rules (e.g., vertical lines, horizontal lines, bordering lines) around a column. Must
 - 3.2.5.2.2.3 The system shall provide the capability to suppress the printing of rules located at the top and bottom of columns. Must
 - 3.2.5.2.2.4 The system shall provide the capability to span rules across multiple columns. Must
- 3.2.5.2.3 The system shall provide the capability to generate rules (e.g., vertical lines, horizontal lines, bordering lines) for tables. Must
 - 3.2.5.2.3.1 The system shall provide the capability to generate rules (e.g., vertical lines, horizontal lines, bordering lines) within a table. Must
 - 3.2.5.2.3.2 The system shall provide the capability to generate rules (e.g., vertical lines, horizontal lines, bordering lines) around a table. Must
 - 3.2.5.2.3.3 The system shall provide the capability to suppress the printing of horizontal and vertical rules independently of one another. Must
- 3.2.5.2.4 The system shall provide the capability to specify rule (line) attributes. Must
 - 3.2.5.2.4.1 The system shall provide the capability to specify rule (line) thickness. Must
 - 3.2.5.2.4.2 The system shall provide the capability to specify rule (line) length. Must
 - 3.2.5.2.4.3 The system shall provide the capability to specify the number of lines in a rule (line). Must
 - 3.2.5.2.4.4 The system shall provide the capability to specify rule (line) orientation. Must
- 3.2.5.3 The system shall provide the capability to generate line numbering for lines of text (e.g., as required by House and Senate Bills). (NOTE: Non text elements such as tables, graphics, and equations are not line numbered.) Must
 - 3.2.5.3.1 The system shall provide the capability to start and stop line numbering anywhere on a page. Must

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- 3.2.5.3.2 The system shall provide the capability to automatically continue line numbering. Must
- 3.2.5.3.3 The system shall provide the capability to automatically restart line numbering at the beginning of a page. Must
- 3.2.5.3.4 The system shall align the baseline of line numbers with the baseline of lines of text. Must
- 3.2.5.3.5 The system shall provide the capability to begin line numbering at "1". Must
- 3.2.5.3.6 The system shall provide the capability to right align line numbering within its column. Must
- 3.2.5.4 The system shall provide the capability to automate the placement of "boiler plate" content (e.g., Congressional Record masthead) located within publication specific style settings (e.g., within a style sheet or template). Must
 - 3.2.5.4.1 The system shall provide the capability to place "boiler plate" content anywhere on a page. Must
 - 3.2.5.4.2 The system shall provide the capability to place "boiler plate" content on even pages only. Must
 - 3.2.5.4.3 The system shall provide the capability to place "boiler plate" content on odd pages only. Must
 - 3.2.5.4.4 The system shall provide the capability to place "boiler plate" content on the first page only. Must
 - 3.2.5.4.5 The system shall provide the capability to place "boiler plate" content on all pages. Must
- 3.2.5.5 The system shall provide the capability to compose using publication specific style settings and processing instructions. Must
 - 3.2.5.5.1 The system shall provide the capability to apply multiple styles to the same content (e.g., Bill to Congressional Record, text of reported bill, text of committee report). Must
 - 3.2.5.5.2 The system shall provide the capability to override default publication specific style settings and processing instructions. Must
 - 3.2.5.5.2.1 The system shall provide the capability to override publication specific style settings and processing instructions with data driven overrides. Must
 - 3.2.5.5.2.2 The system shall allow users to override publication specific style settings and processing instructions with application overrides. Must
 - 3.2.5.5.3 The system shall provide the capability to generate an XSL style sheet based on the publication specific style settings and processing

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instructions that will render an XML file as an approximation of the printed product when viewed in a Web browser (i.e. single column view of the document without page breaks, but matching the style of the printed document). Could

3.2.5.6 The system shall provide the capability to modify horizontal and vertical spacing on a single page without affecting subsequent pages, with the purpose of minimizing the impact of page corrections. Must

3.2.5.6.1 The system shall provide the capability to apply automatic size and layout adjustments in order to expand the rendered data to fill the page. Must

3.2.5.6.2 The system shall provide the capability to apply automatic size and layout adjustments in order to expand the rendered data to fill the page. Must

3.2.5.6.3 The system shall provide the capability to apply operator-specified size and layout adjustments in order to compress the rendered data to fill the page. Must

3.2.5.6.4 The system shall provide the capability to apply operator-specified size and layout adjustments in order to compress the rendered data to fill the page. Must

Hyphenation Information: GPO has twenty-six ASCII files (Word.AAA ~ Word.ZZZ) containing all the words in the hyphenation dictionary with one word to a line. Within these words can be up to 3 levels of hyphenation designated by the numbers 2 (preferred choice), 3 (secondary choice), and 4 (least preferred choice).

3.2.5.7 The system shall support customization of hyphenation settings and rules. Must

3.2.5.7.1 The system shall incorporate the information stored in GPO's customizable hyphenation dictionary.

3.2.5.7.2 The system shall support customization of the number of consecutive hyphenated lines that are allowed. Must

3.2.5.7.3 The system shall provide flexible (user defined) hyphenation for English. Must

3.2.5.7.3.1 The system shall provide the capability to manually insert soft hyphens. Must

3.2.5.7.3.2 The system shall provide the capability to control the aggressiveness of the hyphenation algorithm.

3.2.5.7.3.2.1 The system shall provide the capability to specify the maximum hyphenation to non-hyphenation ratio that will occur on a page of a document. Must

3.2.5.8 The system shall provide the capability to generate bleed tabs. Must

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- 3.2.5.9 The system shall provide the capability to create and retain links between content in multiple publications. Should

3.2.6 Output

Output includes all the processes and capabilities necessary for CSR to render files that can be used for creating printed and digital output. In general, the system must be able to produce output in PostScript, XML, PDF (including PDF Mark and tags), locator tagged files, and HTML.

The system shall also allow users to specify output options (e.g., page size, page orientation), including duplex printing and Galley and Page mode rendering options. The system must also be capable of re-composing pages and frames after corrections are made to content, with minimal impact on the PostScript file as a whole (e.g, pagination, formatting).

The system will also be capable of outputting content to multiple printing devices and distributing the output on several devices simultaneously.

- 3.2.6.1 The system shall provide the capability to output content in PostScript, regardless of the input data. Must
 - 3.2.6.1.1 The system shall provide users with the capability to specify PostScript creation options. Must
- 3.2.6.2 The system shall provide the capability to output content in PDF, regardless of the input data. Must
- 3.2.6.3 The system shall provide the capability to output content in XML with processing instructions, regardless of the input data. Must
 - 3.2.6.3.1 The system shall provide the capability to output XML from content tagged with locators. Must
- 3.2.6.4 The system shall provide the capability to output content in HTML, regardless of the input data. Must
- 3.2.6.5 The system shall provide the capability to output content in locators with processing instructions, regardless of the input data. Must
- 3.2.6.6 The system shall allow users to specify output options available via the installed printer driver (e.g., paper size, page orientation, duplex printing). Must
- 3.2.6.7 The system shall provide the capability to render documents. Must
 - 3.2.6.7.1 The system shall provide the capability to render final pages. Must
 - 3.2.6.7.2 The system shall provide the capability to render proof pages. Must
 - 3.2.6.7.3 The system shall provide the capability to render galleys. Must
 - 3.2.6.7.4 The system shall provide the capability to render galleys with barcodes. Must

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- 3.2.6.7.5 The system shall provide the capability to render galleys with barcodes and large type. Must
- 3.2.6.8 The system shall support the creation of PostScript output containing pdfmark commands to enable functions in PDF files distilled from the PostScript. Must
 - 3.2.6.8.1 The system shall support the creation of PostScript output containing bookmarks to reflect the publication Table of Contents. Must
 - 3.2.6.8.2 The system shall support the creation of PostScript output containing weblinks (i.e. all URLs in the text become hot links, including those spanning multiple lines). Must
 - 3.2.6.8.3 The system shall support the creation of PostScript output containing e-mail addresses (i.e. all e-mail addresses become hot links, including those spanning multiple lines). Must
 - 3.2.6.8.4 The system shall support the creation of PostScript output containing articles to reduce the amount of scrolling required for multicolumn publications. Must
- 3.2.6.9 The system shall generate PostScript that, when distilled to PDF, retains any text equivalents for non-text elements contained in the input data file (e.g., "alt" or "longdesc" tags). Should
- 3.2.6.10 The system shall provide the capability to re-compose and output a series of individual pages and page ranges (e.g., pages i, 2, 6-8, 15, 18, 24-48, and 53). Must
- 3.2.6.11 The system shall provide the capability to re-compose and output a series of individual frames and frame ranges (e.g., frames 2, 6-8, 15, 18, 24-48, and 53). Must
- 3.2.6.12 The system shall provide the capability to place text, graphics or symbols (i.e., "Section ", "Part ", "Notes: ") anywhere within the output document based on specific rule-based tagging conditions. Must
- 3.2.6.13 The system shall provide the capability to output identification information (e.g., file names, date, time, jacket number, print order number, part number) on a page outside the trim margins. Must
 - 3.2.6.13.1 The system shall provide the capability to output identification information on any area of a page outside the trim margins. Must
 - 3.2.6.13.2 The system shall provide the capability to record and output the number of characters within a galley. Should
 - 3.2.6.13.3 The system shall provide the capability to suppress printing of identification information depending on the output device. Must
 - 3.2.6.13.4 The system shall provide the capability to specify character formatting (e.g., font, size) for output identification information. Must

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- 3.2.6.13.5 The system shall provide the capability to print individual filenames corresponding to multiple input files so that each path and filename appears on the printed page exactly where the merge of the file occurs. Must
- 3.2.6.14 The system shall provide the capability to compose fragments of content (XML/SGML subtrees) prior to composing the full document (i.e. to proof a segment of content when the full document is not available). Must
 - 3.2.6.14.1 The system shall provide the capability to compose a series of content fragments prior to composing the full document. Must
- 3.2.6.15 The system shall provide the capability to output content to multiple devices (e.g., proofing devices, laser printers, plate makers). Must
- 3.2.6.16 The system shall provide users with the capability to distribute the printing of a single print request across multiple output devices simultaneously. Must
- 3.2.6.17 The system shall provide the capability to insert processing instructions into data files to capture application-specific settings. Must
- 3.2.6.18 The system shall provide the capability to identify and locate tagging errors. Must
 - 3.2.6.18.1 The system shall provide the capability to report errors to a user. Must
 - 3.2.6.18.2 The system shall provide users with the capability to correct tagging errors. Must
- 3.2.6.19 The system shall provide the capability to set security settings on output files (e.g., read-only, password protected). Must

3.2.7 User Interface

The user interface for CSR will allow for the management of user interactions with the system. Windows-based Graphical User Interfaces (GUIs) and workbenches (sets of available tools) are key components of system user interface capabilities.

A workbench will be created for each user class. Workbenches for internal and external user classes must allow users to access toolsets and perform authorized functions. User roles, access rights, and privileges will determine the features and functionality that will be included in each default workbench.

The user interface must allow users to preview their composition work and have access to an editor to modify source documents. Users will also be permitted to apply and modify processing instructions through the user interface.

The system must conform to current World Wide Web Consortium (W3C) guidelines for interoperable technologies and must comply with best practices and guidelines regarding usability for GUI design.

The system will provide the capability for administrators to customize default GUIs and workbenches for all user classes.

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- 3.2.7.1 The system shall provide a default Graphical User Interface (GUI) for each user class. Must
 - 3.2.7.1.1 The system shall provide a default GUI for Content Originators. Must
 - 3.2.7.1.2 The system shall provide a default GUI for Composition Operators. Must
 - 3.2.7.1.3 The system shall provide a default GUI for Formatting and Style Sheet Developers. Must
 - 3.2.7.1.4 The system shall provide a default GUI for Information Technology & Systems. Must
 - 3.2.7.1.5 The system shall provide a GUI API for Composition System Administrators. Must
- 3.2.7.2 The system shall provide a command line API (i.e. capability to hide the GUI and work strictly with command lines) to system administrators. Must
- 3.2.7.3 The system shall provide the capability to refer to input and output by both page numbers and frame numbers throughout the GUI. Must
 - 3.2.7.3.1 The system shall provide the capability to refer to input by page numbers throughout the GUI. Must
 - 3.2.7.3.2 The system shall provide the capability to refer to input by frame numbers throughout the GUI. Must
 - 3.2.7.3.3 The system shall provide the capability to refer to output by page numbers throughout the GUI. Must
 - 3.2.7.3.4 The system shall provide the capability to refer to output by frame numbers throughout the GUI. Must
- 3.2.7.4 The system shall provide an accurate on-screen read-only preview of the rendered and paginated output. Must
 - 3.2.7.4.1 The system shall provide a preview that includes thumbnails of each page. Must
 - 3.2.7.4.2 The system shall provide the capability to scroll from page to page within a preview. Must
 - 3.2.7.4.3 The system shall provide the capability to view multiples pages in a preview. Must
 - 3.2.7.4.4 The system shall provide the capability to select a page range for a preview. Must
- 3.2.7.5 The system shall provide authorized users with access to an editor (e.g., Textpad, Lexa) for modifying source documents. Must

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- 3.2.7.5.1 The system shall allow users to select an editor from available installed editors. Must
- 3.2.7.6 The system shall provide users with the capability to remove processing instructions (e.g., page numbers, page boundaries) in the native data file. Must
- 3.2.7.7 The system shall provide users with the capability to apply pre- and post-processing (e.g., PDF creation through a watched folder, batch processing, submission of content via FTP). Must
- 3.2.7.8 The system shall provide users with the capability to run external programs on content. Must
- 3.2.7.9 The system shall provide a default workbench for each user class. Must
 - 3.2.7.9.1 The system shall provide a default workbench for Content Originators. Must
 - 3.2.7.9.2 The system shall provide a default workbench for Composition Operators. Must
 - 3.2.7.9.3 The system shall provide a default workbench for Formatting and Style Sheet Developers. Must
 - 3.2.7.9.4 The system shall provide a default workbench for Information Technology & Systems. Must
 - 3.2.7.9.5 The system shall provide a default workbench for Composition System Administrators. Must
 - 3.2.7.9.6 The system shall provide the capability for GPO to manage the toolsets that are available on default workbenches. Must
- 3.2.7.10 The system shall maintain a consistent look and feel throughout workbenches and GUIs. Should
- 3.2.7.11 The system shall provide GUIs capable of displaying supported types of electronic files. Must
- 3.2.7.12 The system shall provide GUIs that accept input of information by users. Must
- 3.2.7.13 The system shall provide GUIs that allow users to login to the system. Must
- 3.2.7.14 The system shall display the appropriate default GUIs and workbenches based on a user's role, access rights, and privileges. Must
- 3.2.7.15 The system shall provide GUIs that can be displayed on the Windows platform. Must
- 3.2.7.16 The system shall provide GUIs that are capable of providing feedback, alerts, or notices to users. Must

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- 3.2.7.17 The system shall graphically display progress information for composition processing to the user (e.g., page counter, progress bar, percentage complete).
Should
- 3.2.7.18 The system shall provide GUIs that are capable of providing context specific help and user support. Must
- 3.2.7.19 The system shall comply with best practices and guidelines regarding usability for graphical user interface design. Must
- 3.2.7.20 The GUI shall conform to current World Wide Web Consortium (W3C) guidelines for interoperable technologies including but not limited to the following. Must
 - 3.2.7.20.1 The GUI shall conform to Extensible HyperText Markup Language (XHTML). Must
 - 3.2.7.20.2 The GUI shall conform to Cascading Style Sheets (CSS). Must
- 3.2.7.21 The system shall provide the capability for Administrators to customize default GUIs and workbenches. Must
 - 3.2.7.21.1 The system shall provide the capability to add tools. Must
 - 3.2.7.21.2 The system shall provide the capability to remove tools. Must
 - 3.2.7.21.3 The system shall provide the capability to hide tools. Must
 - 3.2.7.21.4 The system shall provide the capability to modify the placement of tools. Could
 - 3.2.7.21.5 The system shall provide the capability to modify the size of tools. Could
 - 3.2.7.21.6 The system shall provide the capability to select tool text size from available options. Could
 - 3.2.7.21.7 The system shall provide the capability to select tool color scheme from available options. Could
- 3.2.7.22 The system shall provide the capability for users to customize their GUI and workbench.
 - 3.2.7.22.1 The system shall provide the capability for users to revert to their original default GUI and workbench. Must
- 3.2.7.23 The system shall provide the capability to maintain interface configurations across user sessions. Must
- 3.2.7.24 The system shall provide authorized users with the capability to view, save, and manage processing instructions and settings for re-use or duplication. Should

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3.2.8 Metrics

- 3.2.8.1 The system shall compose XML content (using Bill Numbers HR1461IH, HR2601IH, HR2828IH, HR2864IH, HR3171IH, HR4503IH) at an average rate greater than or equal to 5208 pages per minute with the following benchmark hardware and software configuration: Windows XP Pro, Service Pack 1, build 2600; 2.8 GHz Intel Pentium 4; 16k primary memory cache; 1024k secondary memory cache; 510 MB installed memory. These six Bill files will be made available to vendors for pre-bid testing. Must

3.2.9 Integration

CSR needs to be integrated with various pre-processing and post-processing applications. These applications include the following:

- Authoring tools/Text editors (e.g., XMetaL, Xywrite, TextPad, word processors, MathType)
 - Translation tools and Conversion programs
 - Acrobat Distiller
 - Bound Record indexing process
 - CDTP (internal program that typesets to an ASCII file)
 - Other WAIS utilities (e.g., add hot links)
 - Productivity Management systems
- 3.2.9.1 The system shall provide the capability to define, schedule, and execute automated end-to-end batch processes including pre-processing, composition processing, and post-processing. Must
 - 3.2.9.2 The system shall provide the capability to create a workflow for a specific publication. Must
 - 3.2.9.3 The system shall provide the capability to synchronize version changes to the composition program. Must
 - 3.2.9.3.1 The system shall provide the capability to synchronize version changes to the composition program so that when an update/rollback is made to the program, all workstations can be changed automatically. Must
 - 3.2.9.3.1.1 The system shall provide users with the option of declining version changes for individual workstations. Must
 - 3.2.9.3.2 The system shall provide the capability to support previous versions of the composition program. Must
 - 3.2.9.3.2.1 The system shall provide the capability to revert to a previous version of the composition program. Must

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Appendix 1: Glossary

Bleed Tabs: A solid ink square bleeding at the thumb edge of a page or pages as a guide for the location of specific text matter.

Boilerplate: A unit of writing that can be reused over and over without change. Also referred to as write-ins.

Brackets: A special character that spans lines of text.

Continuation indicators: Shows that a document component has been continued from one page to the next or from one column to the next (e.g., the word “continued”).

Composite characters: A combination of two or more component character shapes usually, but not limited to, a base character and one or more diacritical marks that are placed above and/or below the base character (e.g., accent mark).

Cut-in: Subheading set flush into the text at the left edge. Also referred to as a side heading.

Dingbat: Type faces that consist of symbol characters such as decorations, arrows, and bullets. Also referred to as Pi characters.

Frame: GPO term for a composition page unit. The number of frames in a publication differs from the number of pages by the number of blank pages. Frame numbers always are numbered consecutively starting from ‘1’ for the first printed page in the publication. Page numbers may or may not start at the first printed page (i.e. because preliminary pages are often numbered i, ii, iii, etc.), or only restart at ‘1’ in the first issue of the year (e.g., for the Federal Register).

Frame Number: The sequential number identifying a composition page unit.

Folio: A page number.

Footnote identifiers: Enumerated (using Roman figures, italic letters, or symbols) references to footnotes in text and the actual footnotes themselves.

Galley: A proof taken from composed type before page composition to allow for the detection and correction of errors.

Glyph: The shape given in a particular typeface to a specific grapheme or symbol.

Gutter: The inside margin of a publication and the space between two columns of type.

Hyphenation ladder: Hyphens on two or more consecutive lines, which causes distraction to the reader.

Image area: The area of a page inside the margins in which you put the text and graphics (objects can extend outside this area.)

Kerning: The process of adjusting letter spacing in a proportional font.

Landscape: Landscape orientation, where the width of the page is greater than the height, is often used for images and diagrams that need to be wider than a portrait page.

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Leaders: In typesetting, rows of dashes or dots used to guide the eye across the page. Used in tabular work, programs, tables of content, etc.

Locator code: GPO tagging scheme that enables the specification of typesetting instructions into a data file (e.g., an example of a locator code is bell-l22. The “bell” character is the hex 07 character which is used to signify the beginning of a locator code. In this case, l22 represents the code used to generate a paragraph with a 2-em space indent and is used to generate the typesetting of subsections in legislation.)

Portrait: Portrait orientation, where the height of the page is greater than the width, and is more common for the pages of books.

PostScript: A page description language developed by Adobe Systems.

Preliminary composition: Preparatory representation of content format or structure.

Processing instructions: Artifacts of the formatting and pagination of a publication embedded in the original document file (e.g., page breaks, line numbers, page numbers).

Publication specific style settings: Formatting rules and specifications associated with a publication.

Raised cap: An enlarged initial letter extending above the body text, used as a graphic element to draw attention to the beginning of a story or chapter.

Repeating Headings: A heading that repeats within a page from column to column.

Scotch Rule: A combination thick and thin solid rule used to border a graphic.

SGML/XML Subtrees: A complete nesting of SGML or XML elements in a data structure that represents a portion of an accompanying DTD or Schema

Side note: Text printed in the outer side margin.

Soft Hyphen: A specially coded hyphen which is only displayed when formatting of the hyphenated word puts it at the end of a line.

Thumb Index: A series of rounded indentations cut into the front edge of a book, each labeled (e.g., with a letter) to indicate a section of the book. Also referred to as a margin index and a bleed index.

Tracking: The manipulation of space between a group of letter (or glyphs) to optimize the typeset density of a block of text. Also referred to as letter spacing and character spacing.

Trim Margin: The margin on the open side of a publication, away from the bind; also called Thumb, Fore Edge, Face or Outside Margin.

Trim size: The final size of a printed page after excess edges have been removed.

Unicode: An industry standard designed to allow text and symbols from all of the writing systems of the world to be consistently represented and manipulated by computers. Unicode characters can be encoded using any of several schemes termed Unicode Transformation Formats (UTF).

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Widow and orphan lines: Lines less than full width of measure at top of pages or columns. The 'orphans' property specifies the minimum number of lines of a paragraph that must be left at the bottom of a page. The 'widows' property specifies the minimum number of lines of a paragraph that must be left at the top of a page.

Workbench: A customizable graphic user interface that allows users to interact with a software application through the selection of tools, key commands, help options, and other functionality.

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Appendix 2: Acronyms

ASCII

American Standard Code for Information Interchange

CALS

Computer-Aided Acquisition and Life-Cycle Support

CSS

Cascading Style Sheets

DOM

Document Object Model

DTD

Document Type Definition

EPS

Encapsulated Postscript

GUI

Graphical User Interface

HTML

Hypertext Markup Language

HTTP

Hypertext Transfer Protocol

JPEG

Joint Photographic Experts Group

OCR

Optical Character Recognition

PDF

Portable Document Format

SGML

Standardized General Markup Language

TIFF

Tagged Image File Format

WAIS

Wide Area Information Server

W3C

World Wide Web Consortium

XHTML

Extensible Hypertext Markup Language

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XML

Extensible Markup Language

XPATH

XML Path Language

XSL

Extensible Stylesheet Language

XSLT

Extensible Stylesheet Language Transformations