Contractor's Final Report

TexSpecs - Tools for Purchase Description and Testing Requirements Management

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14. ABSTRACT
TexSpecs is a knowledge-based system that enables the exchange of commercial and military documents as standardized, linked digital models in a form that can be interpreted by humans and machines. This reduces the need for manual change management and data re-entry resulting in a rapid and more uniform interpretation and implementation of DLA requirements. This phase of TexSpecs consisted of tasks devoted to improving the utility of the system and the development of functional requirements for a production environment. One focus in this phase has been stakeholder engagement, with the goal of automating and streamlining tasks related to the management of technical data.

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I – Executive Summary

Problem Statement

DLA requirements are distributed across a network of documents created by different authors. These documents are presented in a static format, typically paper or PDF, that is suitable for reading but require users to manually re-enter data from the documents to their enterprise systems. This creates multiple data entry points of failure and makes it difficult for DLA, its customers and suppliers, to manage technical data and its changes. This phase of TexSpecs created digital model-based tools to improve Purchase Description and Interim Change management, and Specification modernization. The next phase will create an extensive library of digital models: The PD Library

Scope

To address these issues, the MUST program developed TexSpecs, a Knowledge Based system that enables the exchange of commercial and military documents as standardized, linked digital models in a form that can be interpreted by humans and machines. This reduces the need for manual change management and data re-entry resulting in a rapid and more uniform interpretation and implementation of DLA requirements.

This phase of TexSpecs consists of tasks devoted to improving the utility of TexSpecs and the development of functional requirements for a production environment. The particular focus in this phase has been automating and streamlining tasks related to the management of technical data, particularly the purchase description documents (PDs) commonly used in C&T and associated interim change (IC) data. The end result of this focus is functionality that allows TexSpecs to be used as a PD/IC management tool.

There are four main elements to this tool:

- Word round-trip: The ability to export a PD from the MUST KB, make changes, check for MIL-STD-961 compliance and re-onboard it as a new draft document.
- IC Onboarding: The ability to on-board IC data in the form of MS Word files, and manage the data in in the KB.
- Requirements extraction: The ability to pull structured requirements from selected PDs for use in test validation tasks.
- Role-based access control: A way to grant specific roles to users that defines their permission to carry out various functions.

Technical Discussion

Word round-trip

In a previous phase of the MUST project we developed the functionality to export from the digital model in the MUST KB to create a MS Word version of the document. This can at the user's request include selected IC data embedded into the document. Users can then edit these documents to create an updated version.

In order to get the revised version back into the KB, we developed the capability to generate MUST digital modes from MS Word Documents and created a "drag-and-drop" interface for accessing this functionality.

Key functionalities available to the user when onboarding a new PD revision are useful in assessing the quality of the update process. First, the uploaded document can be compared with the previous revision via a "red-line" view where differences are highlighted. Second, a report on compliance with key MIL-STD-961E requirements is automatically generated. This includes checks on correct paragraph numbering, proper content in the "Applicable Documents" section, and checks on references to cancelled documents, among other things.

IC Onboarding

As with the PD documents, we developed the ability to generate digital models for IC files created in MS Word format. As with the document onboarding, a drag-and-drop interface was developed that allows the user to generate a digital model from the Word document.

Requirements extraction

We developed code to automatically generate structured requirements data based on the contents of relevant document tables. This can be a complex operation, as the information for a given requirement may be spread over several rows in a table or even among more than one table in the document.

The primary use of the structured requirements data in this phase of the project was by a third-party application via the TexSpecs Application Programming Interface (API). We also included a view into this data from the TexSpecs web application.

Role-based access control

As a rule, different users carry out different tasks in the PD/IC management workflow. For example, one user may be allowed to upload a purchase description document as a draft, but not have permission to make it public. At least one stakeholder with "administrative" role should have the ability to define these roles for other users in their group.

To this end, we worked with users to define the appropriate roles and permissions and developed an administrative console so that stakeholders can manage this information.

Results

Working in concert with stakeholders and MUST partners, significant improvements were made in the TexSpecs system in order to develop PD/IC management capabilities. These improvements affected data input, change management, data extraction, and interoperability with other systems. In particular, it was recognized that the "Word Round Trip" functionality, combined with the ability to add interim changes and to identify MIL-STD-961E conformance issues, could be useful in the preparation of new document revisions. To help with this activity, we added change data for priority specifications, and worked with stakeholders on developing training on the steps needed for document revision.

At the conclusion of this delivery order, we have in place a working prototype that allows users to:

- Identify and view purchase descriptions and other documents of interest.
- Add interim change data to the KB or find and use previously added IC data.
- View the PD with relevant ICs incorporated into the document view.
- Export the PD as a MS Word document, to allow revision without re-typing the entire document.
- Re-onboard the revised document and run a number of quality checks related to MIL-STD-961E conformance.
- Manage roles and permissions related to these functions.

Technical details on these functions are included in body of this report, and the Appendices include Reference Manuals and training guides.

Another element of the working prototype is the application programming interface (API), which provides access to the rich collection of digital models for use by new applications. Working with LMI and TexBase, we provided structured requirements and testing data for use in the Source Testing tool being developed for use by manufacturers and the DLA Product Testing Center.

Conclusion

Under this delivery order the TexSpecs software and the MUST Knowledge base were enhanced in several ways that provided stakeholders with PD/IC management capabilities. We are beginning to see stakeholder engagement with the software in order to carry out needed work and have several potential avenues for further improvements and extensions.

Table 1 Milestone Roadmap click link to navigate to reports

KEY DEVELOPMENTS ↓	MILESTONE REPORTS →	T2.1-16-MAR-18	T1.3-18-APR-18	T1.1 -18-JUN-18	T1.2-18-JUN-18	T2.2-18-JUN-18	T2.1-17-AUG-18	T2.1-18-DEC-18	T1.1- 18-APR-19	T2.1-18-JUN-19	T3-18-JUN-19
WORD ONBOARDING											
	Pushbutton export			☑							
	Inera Review								☑		
	Access Control Proposal				☑						
LMI SPEC AUTHORING TOOL			☑				☑				
LMI PTC TOOL							☑				
MIL-STD-961 TOOLS											☑
REQUIREMENTS EXTRACTION											
	Initial Vocabulary	☑									
	Extraction Metrics							☑			
	Standardization Study									☑	
	Structured Semantics									☑	
PTC MATERIAL EXCHANGE											
	Initial Requirements					☑					
USER GROUP FINDINGS											☑

II – Introduction

Definition of Problem

DLA requirements are distributed across a network of documents created by different authors. These documents are presented in a static format, typically paper or PDF, that is suitable for reading but require users to manually re-enter data from the documents to their enterprise systems. This creates multiple data entry points of failure and makes it difficult for DLA, its customers and suppliers, to manage technical data and its changes.

Documents containing technical data are heavily cross-referenced. The data for a given item is typically spread over dozens of documents from multiple publishers. Because documents can be revised, cancelled, or replaced, this can make the job of configuration and change management for technical data a time-consuming manual process. Failure to communicate the correct set of technical requirements due to a missed change can result in the purchase of items that do not satisfy the current mission.

Change management also becomes an issue when specifications are being revised. In most cases, the new revision needs to incorporate information from Interim Change files (ICs) that specify updated technical requirements that have been used in recent procurement. These are typically stored and transmitted as separate static files. In some cases, the changes for one document are spread over several files corresponding to different end items.

Scope of Work

To address these issues, the MUST program developed TexSpecs, a Knowledge Based system that enables the exchange of commercial and military documents as standardized, linked digital models in a form that can be interpreted by humans and machines. This reduces the need for manual change management and data re-entry resulting in a rapid and more uniform interpretation and implementation of DLA requirements.

The TexSpecs system supports:

1. DLA C&T in the preparation and management of technical documents (Specifications, Commercial Item Descriptions (CIDs), and Purchase Descriptions (PDs)), along with related Interim Changes.
2. The DLA Product Test Center (PTC) through integration with a test report validation tool.
3. C&T PD and Spec authoring through integration with MS Word.

The first phases of TexSpecs were devoted to understanding the technical data issues, assessing the feasibility of a Knowledge Based approach and the development and initial scaling of a solution.

This phase consists of tasks devoted to improving the utility of TexSpecs and the development of functional requirements for a production environment. One focus in this phase has been stakeholder engagement, with the goal of automating and streamlining tasks related to the management of technical data.

III - Technical Discussion

Task 1: Purchase Description Management

1.1 MS Word Integration and Round Trip

In the previous phase of this project, we developed the capability for users to download specifications and PDs in MS Word format with selected interim changes included in the document body. This provides the user with a base document for the preparation of the next revision. In order to re-onboard the modified document, it was necessary to first convert it to XML, which could be a time-consuming and labor-intensive process, even when using a software package such as Inera eXtyles. In order to have an efficient "round trip" (export-modify-import), a mechanism for converting Word documents back to the knowledge base format with a minimum of manual user intervention was developed under this delivery order.

The "docx" format used by MS Word consists of a compressed archive of files. These files contain style, content, and structural information. For the textual content, the files use a version of XML called "Open XML". The goal of this task is to read that content and structure and convert it to the ISO-STS XML format that can be on-boarded into the TexSpecs system.

Rather than starting from scratch, we evaluated several software libraries designed to read and manipulate the data from the Word files. We settled on a free software library called "docx4j"[1], which provides programmatic access to the Word XML in the Java environment used by TexSpecs.

One of the challenges in the conversion is the amount of freedom that an author has in producing an MS Word documents. For instance, he or she may decide to indicate section and subsection headers using bolded or italic text rather than making use of the "header" styles available in the Word application. To the end user, it may not look different. However, to correctly build the digital models used in TexSpecs, it is necessary to properly organize the document hierarchy (sections, subsections, etc.). In addition to this, in order to recognize the front-matter information (document ID, title, date, etc.), it has to be arranged correctly in the Word Document.

Fortunately, the specifications, standards, CIDs, and PDs that are of interest to DLA stakeholders do follow certain conventions in terms of format and content. We can take advantage of this to narrow down the array of possible MS Word structures we need to handle. For example, the front matter always appears in a certain way. There can be variations in this presentation, but they can be accounted for in a fairly straightforward manner. Initial iterations of the TexSpecs conversion code recognized a limited number of MS Word structures, focusing on formats seen in specs and PDs. As more documents were tested, we expanded the number of Word structures that could be mapped to ISO-STS. In addition, because certain front-matter elements need to be present, we fine-tuned the tolerance for variations in the content (for example, 'INCH-POUND' and 'INCH

[1] https://www.docx4java.org/trac/docx4j

POUND'. MIL-STD961E specifies the former, but many existing documents use the latter).

In integral part of this effort is the user interface for stakeholders to on-board Word documents. We made use of a previously developed interface, which was designed to on-board documents in XML format, and modified it to allow Word document onboarding as well. Figure 1 shows the on-boarding interface, with a simple "drag and drop" option for bringing Word files into the system. The initial implementation of this capability is discussed in the milestone report attached as Appendix C.

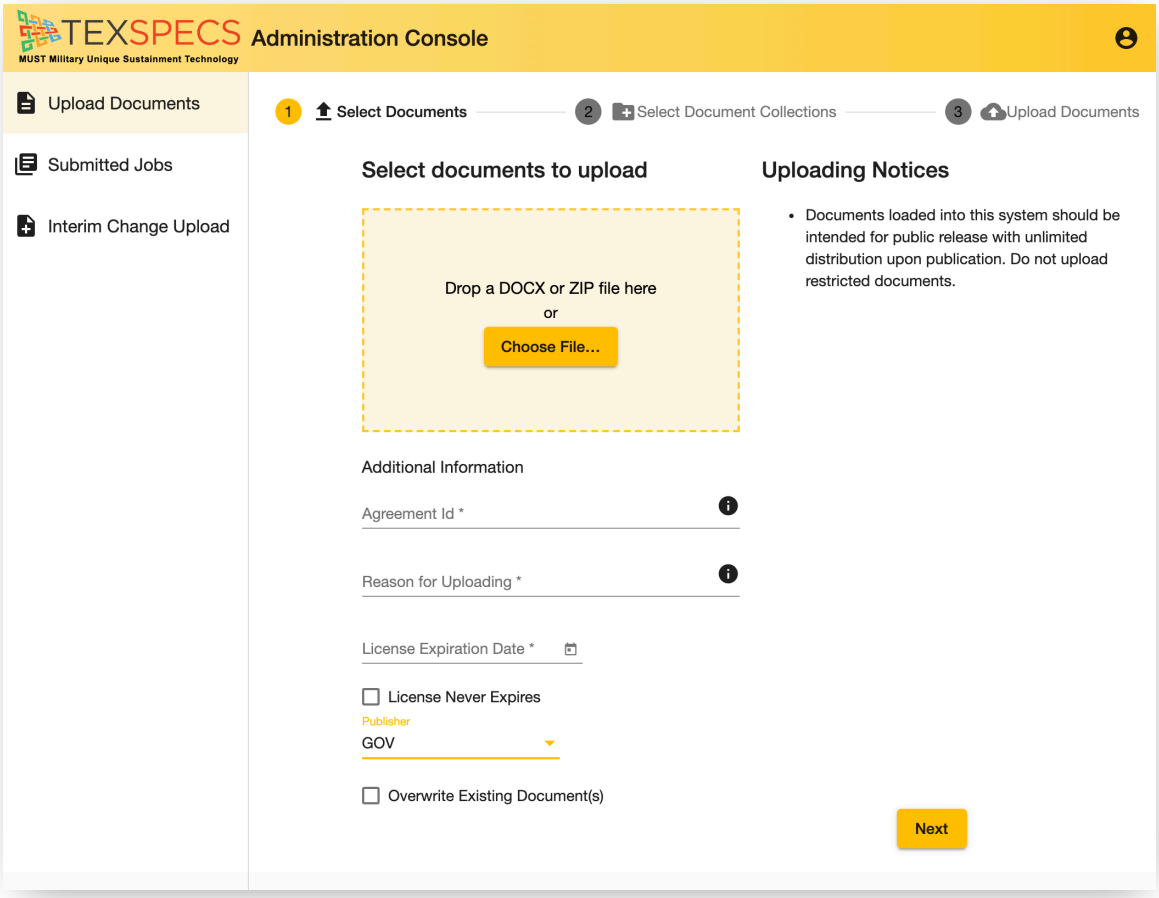

Figure 1- Document On-boarding Interface

There are two types of test documents used to tune the system and to ensure that Word documents were properly converted. The first were documents generated from the TexSpecs application using the "Export as Word" functionality. For "round-trip" to be meaningful, it is crucial that these can be imported without issue. Another type was from a small set of documents in Word format obtained through another project. These were used to identify Word structures not present in the exported documents. This information was then used to expand the range of Word structures that can be converted into a TexSpecs digital model.

From the first set of documents, we initially found issues having to do with document front matter as discussed above. That is, while some digital models use "INCH POUND" as the measurement system, we were initially applying strict rules and not allowing re-onboarding unless the correct format "INCH-POUND" was used. We subsequently modified the on-boarding code to allow for some variation. It should be noted that our requirements checker will still identify the issue with the incorrect formatting.

Another issue found was that older documents that don't have section numbers do not on-board correctly. An example of this is the Commercial Item Description A-A-55236, published in 1993. This becomes an issue because section and paragraph numbering are used during the Word-to-XML conversion to determine document structure. We are looking into a solution that would tag section headers with a specific style on export. Insofar as new document revisions should have proper section and paragraph numbering, this work has not been given high priority.

Finally, for the export-import round trip there are sometimes small changes introduced in table and list formatting that do not change the meaning of the content but do result in extraneous "redline" differences when the new document is compared with the original. Work is planned to better preserve the formatting during the round trip.

For documents not originating from the digital models, additional issues were found. Key among these are:

- Word documents sometimes include hidden characters and bookmarks that should be ignored.
- Complex lists and tables formatted in non-standard ways are not always converted correctly.

These issues are being addressed. In the short term, we can be restrictive about what is acceptable for on-boarding to the system. This places some constraints on authors and editors, but such constraints are not uncommon in the realm of technical document preparation. In the longer run, we would like to be able to accept as wide a range of input files as is feasible.

1.2 Administration and Access Control

The increasing power and scale of TexSpecs requires greater control governing who has access to what information. For instance, the MS Word export enables users to edit authoritative documents that only a preparing activity or its approved delegates should do. At other times, DLA may want to restrict viewing and sharing of documents while they are in draft status. Under this task, we added a Role Based Access Control (RBAC) and administrative module that allows C&T more ad hoc control of user access. The preliminary milestone report on RBAC design is included as Appendix E.

Four roles were defined: User, Author, Publisher, and Administrator. Actions available to each role are the following:

User:

- Can search for and view defined set of docs (for TexSpecs users, this includes government specifications, standards, commercial item descriptions, and “published” purchase descriptions).
- Can search for and view “public” interim changes.

- Can create/view/edit/delete compositions and interim changes.
- Can grant view of created compositions and interim changes to other users.

Author:

- All of User role abilities.
- Can export government documents (including purchase descriptions) to MS Word.
- Can onboard and view draft PD documents.
- Can delete own draft PD documents.

Publisher:

- All of Author role abilities.
- Can delete any draft PD.
- Can publish draft PD (that is, add to public PD collection that can be viewed by anyone with "User" role.)

Administrator:

- All of publisher role abilities.
- Can manage users (add, assign role, change password, delete).

Users with "Author" role have access to the document on-boarding interface discussed in the previous section. Users with administrator role have access to the "User" tab on the Administration console. From this interface, users can be enabled or disabled, and roles can be assigned.

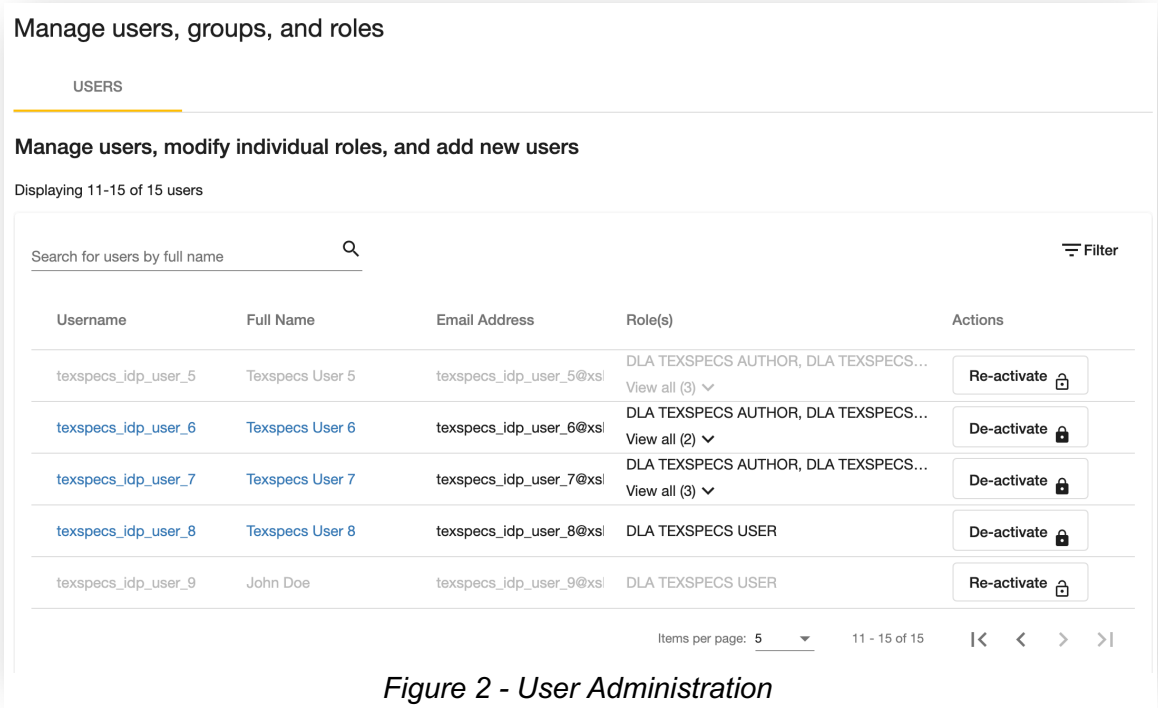

Figure 2 - User Administration

Figure 2 shows the User tab on the Administration Console. Administrators have the ability to activate and de-activate users, and to assign and revoke roles. Activation and de-activation are done using the buttons on the right side of the table. This is done by clicking on the user's name in the user administration table, which brings up a window as

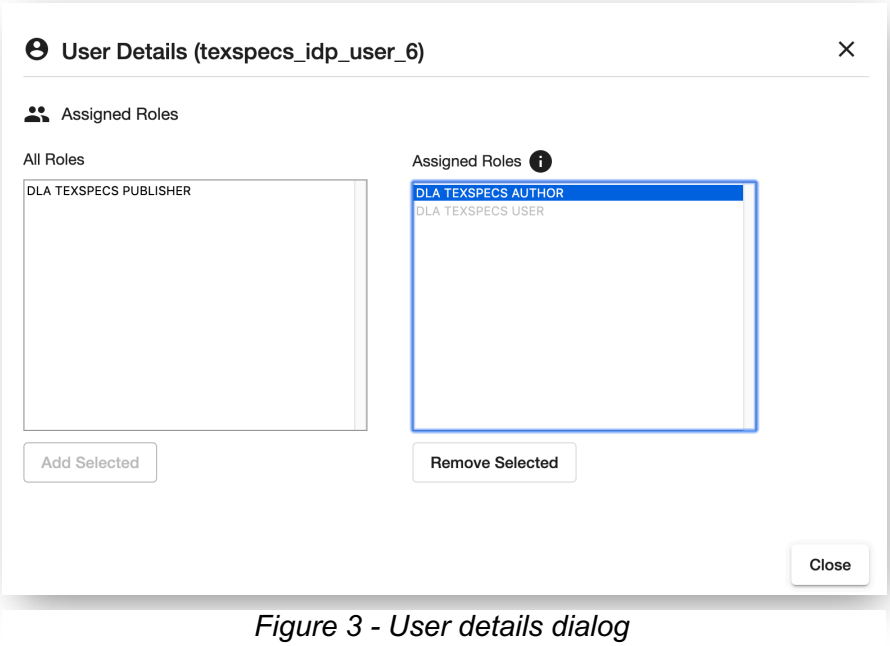

Figure 3 - User details dialog

shown in Figure 3. At present, the "Administrator" role can only be assigned or revoked by XSB.

1.3 Integration with Structured Spec Authoring Tool

Within the MUST project, there has been ongoing research regarding the feasibility of a specification authoring tool using form-based input. Integration of this tool with the TexSpecs specification management system would have several benefits. In almost all cases new specifications and purchase descriptions are modifications of existing documents. As a result, it is useful for any authoring tool to have access to the existing digital models in the MUST KB. In addition, there is a large overlap in the data structures, interfaces, and data libraries between the spec authoring tool and the tools that will be developed for requirements extraction under task 2 of this project.

Under this subtask, we supported work being done by MUST partner LMI to develop an authoring tool. Specifically, we worked to ensure that the information needed by the authoring tool could be accessed via the TexSpecs API, and that documents written using the LMI authoring tool could be added to the MUST KB. The exchange of data between the two systems was carried out using the API calls for on-boarding and retrieving the standard ISO-STS formatted documents. The initial requirements definition for data exchange is attached as Appendix F.

Task 2: Product Requirements Extraction and Collaboration

2.1 Enhanced Requirements Extraction

In a previous phase of this project, specification text was analyzed using Natural Language Processing (NLP) tools to identify individual requirements and, in many cases, identify the subject of the requirement and links to verification methods. Subjects were matched to a standardized vocabulary that was a combination of published terminologies and terms extracted from a statistical analysis of data in the knowledge base. It is hoped that further work along these lines would also lead to the extraction of structured information about attributes and values associated with individual requirements.

In addition to narrative text, we also demonstrated, in previous phased of the project, the ability to recognize and extract structured data from tables containing measurement information for clothing.

Under this delivery order, our focus was on the use of extracted requirements to help populate a test report tool being developed by MUST partner LMI. The focus was on fabric requirements for physical training uniforms. In the reports, the details of the tests required for the materials are submitted along with the results of the tests. Typically, this information needs to be entered by hand for each report. If the subjects, attributes, and values of these test requirements can be automatically extracted from the relevant document, then they could be used to pre-populate the forms with the correct information, leaving only test results to be entered by hand.

Based on analysis of the purchase descriptions for the physical training uniforms, we determined that the needed information was contained in tabular form. Typically, these tables contain columns identifying "Characteristics" and "Requirements". In some cases, test methods are identified in the same table, and in other cases they are in separate tables. Figure 4 shows an example of a requirements table that includes test method

TABLE I

Exterior Material

Characteristic	Requirement	Test Method
Weight (oz./sq.yd.)	2.9 +/-.2 oz/sq yd	ASTM D3776 Option C
Breaking strength (lbs.)		ASTM D5034
Warp	100 Min.	
Filling	130 Min.	
Tearing strength (lbs.)		ASTM-D-1424
Warp	4.0 Min.	
Filling	6.5 Min.	
Dimensional stability (max.)		AATCC-135
Warp	6.2%	Table I, method 3, IIIA, iii
Filling	1.5%	

Figure 4 - Example of requirements table

information.

A few things in this example are worth noting. First, unit information (lbs., percent, etc.) may appear in either the characteristic or requirement column, or both. Information about limits (minimum, maximum, tolerances) may also be in either column. Full definition of

a characteristic may be spread across several rows (i.e. "warp breaking strength" and "filling breaking strength"). In this case, the subject of the requirements ("exterior material") is identified in the title of the table, but in some cases may appear in the table body. All of these variations were addressed in the extraction code in order to format the data in a standardized way that can be re-used by other applications. The development of the initial standardized vocabulary is discussed in Appendix G.

The standardization was carried out by developing a rules-based approach to recognize certain patterns in the table structure, such as spanned rows (seen in the test method column in the above figure), or indented text which often indicates "continuation" of compound characteristics. We also applied "regular expression" pattern-matching techniques to identify units and limits. Metrics for assessing the quality of extracted requirements are discussed in the milestone report attached as Appendix I.

As discussed above, extracted subjects and attributes were matched to a standardized vocabulary. Within the knowledge base, this is represented using "Simple Knowledge Organization System" (SKOS), a W3C standard. Extracted results were made available through the TexSpecs API, for use in the source sampling tool being developed by LMI and TexBase. Regular meetings were held, typically via teleconference, to ensure that the information was being transmitted in a form useful to the tool. To this end, we defined matches between our standardized vocabulary and a vocabulary supplied by TexBase. Using this, we could pass the TexBase vocabulary ID as part of the data returned by the API. The initial design of the data exchange in the API is discussed in Appendix J.

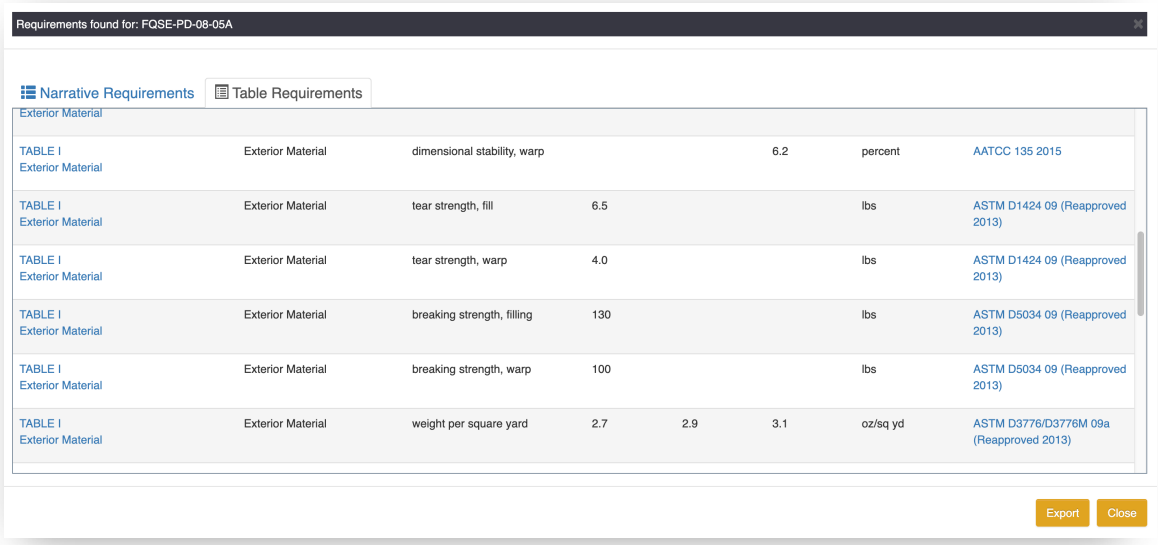

Figure 5 - Extracted data in TexSpecs app

In addition to the API, we have made the extracted information available from within the TexSpecs web application, as shown in Figure 5. The table includes minimum, maximum, and nominal values as appropriate where limits are given. It also includes links to the source table for the data, and to test method where appropriate. A summary report on the semantics research done under this delivery order is attached as Appendix K.

2.2 Integration with Industry Fabric Repository

Inconsistent product requirements data is a problem to the military and commercial enterprises in the textile space. The Product Lifecycle Management Company, PTC Inc., is working with the Clothing and Textile industry to develop the Materials Library and Collaborative Exchange (MLCX). The exchange currently focuses on footwear materials but plans to span the entire fashion sector. The exchange provides a secure portal where suppliers can upload and maintain data on Materials, Color, 2D and 3D designs and Test Results. These are some the same data that the MUST program was trying to capture. During this phase of the MUST project, XSB worked with PTC to explore a link between the MUST KB and MLCX. The initial design of the data exchange is discussed in Appendix L. However, it became clear in the early phases that this commercial library would not contain information about materials of interest to DLA, so this part of the effort was redirected under a contract modification.

Task 3: User Engagement and Interface Enhancements

There are extensive user interface components in the TexSpecs software, some developed or improved under this delivery order, and some developed in previous phases of the MUST project. Under this task we worked with DLA users to better understand how they might make use of TexSpecs in the course of their work. Inevitably, these interactions revealed opportunities to improve the TexSpecs user experience. This enabled us to provide training and to refactor the tool interfaces to ensure they are intuitive and useful for DLA users.

As a result of stakeholder discussions, improvements were made in navigation, display, change management, and analysis tools. In addition, continued attention was given to making sure that the web site performed various user actions quickly, so that users were not left waiting for results. A summary of this effort was reported in a milestone report dated June 18, 2019 and is included as Appendix M in this report.

In the final months of this delivery order, stakeholders indicated that they were interested in using TexSpecs as a tool to help in an effort to create new revisions of aging specs and CIDs. TexSpecs is useful in this respect as the models can be exported to MS Word documents by authorized users. These Word files can then be modified to create the new version. When the system has IC data for a document in the knowledge base, this information can be integrated into the exported Word file, providing a straightforward path for integrating the change in the next revision. The TexSpecs system can also be used to check selected MIL-STD-961E requirements, such as the currency of referenced documents. This can then be used to help make sure the revised document is in compliance.

In order to aid in this effort, the Word output format was modified to ensure that it conformed with the template needed for the coordination process used in developing the new revision. Several training sessions were held, and detailed documentation produced, to familiarize stakeholders with the TexSpecs features needed in this effort.

Task 6: TexSpecs Data Conversion

Under contract modification 0007 a task was added to enhance the contents of the knowledge base by adding specification, CID, and PD documents of particular interest to

the C&T program. The documents were chosen from the 2018 C&T Forecast, with priority established in coordination with C&T stakeholders.

Commercial and Government reference documents associated to these PDs were also identified and added to the TexSpecs collection as required. Reference documents already in TexSpecs were brought up to date with the most recent versions. In total, 117 documents were added under this task between June 2018 and April 2019. The list of documents, along with the date onboarded, is provided in Appendix N. In addition, IC files for 35 PDs and CIDs provided by C&T were processed and added to the knowledge base.

VI - Conclusion

Accomplishments

Under this delivery order, the MUST KB and the associated TexSpecs software were extended in several ways in order to provide PC/IC management capabilities:

- The "Word Round Trip" capability for both documents and interim changes was improved and put to use in the development of new document revisions.
- Structured requirements were extracted from tabular data and used by MUST partners via the Application Programming interface.
- The MUST KB contents were enhanced by the addition of over 120 documents and associated interim change data.
- Evaluation and feedback from stakeholders helped guide the software development.

Benefits:

Technical data for items managed by DLA and the services is contained in a large, dynamic network of documents and change files. The MUST KB and TexSpecs software, through the creation of digital models, provide a useful and flexible platform for carrying out a wide variety of tasks associated with this technical data. This includes:

- Faster access to relevant information in the interconnected web of technical data.
- Tools for configuration and change management.
- User interfaces for managing and updating data, and for running compliance checks.
- Automated extraction of structured requirements. This includes links to test procedures, where available.
- Advanced application programming interfaces for computer-to-computer communication.

Lessons learned:

The design of digital models and the translation of printed data to the digital model format is a complex process. The goal in building the model is not to reproduce every idiosyncrasy of the printed page, but to capture the technical data in a way that preserves the meaning and makes it interoperable with computer-based tools. In translating from MS Word to the digital model, which was a large component of the current effort, is complicated by the fact that the Word documents can be assembled in many different ways. It is not feasible to take any arbitrary document and turn it into a meaningful digital model. However, the preparation of technical data documents is, as a rule, governed by standards such as MIL-STD-961E. This means that certain document elements will be present and arranged in a certain way. As a result, it is feasible to convert these documents to digital models. There was an iterative element in carrying out this work, as we did find that unusual constructs were sometimes used in source documents (nested lists, complex captions containing tabular data, etc.). An important aspect going forward will be communication to authors and editors of what document structures can and cannot be converted to digital models.

The management of interim changes is currently not standardized. One stakeholder suggestion that came up was the possibility of automatically modifying the text of a document being viewed, based on an interim change. Because the format is not currently standardized, this is not really feasible. We developed a standard format that would allow this functionality, with the assumption that this could be something that could be used going forward. For demonstration purposes, a number of existing interim change files were converted to this format. However, this is a labor-intensive process and is not scalable for the long term.

In the extraction of structured data, which was another significant part of this effort, we found that the regularity of how physical characteristics are expressed in tables is an aid to automating the extraction process and allow the process to be applicable across a wide range of documents. On the other hand, normalizing the attributes from one document to another or from one application to another is currently a somewhat manual process. For example, in context, "count", "yarn count", and "yarns per inch" may all refer to the same attribute. For the sake of interoperability, we want our model to recognize this. At present, it is necessary to insert these relationships manually in the knowledge base. For the sake of future scalability, it would be advantageous to have a more automated way of doing this. Recent advances in machine learning and information extraction may make this possible, and we recommend further research into it.

Next steps:

As a result of the work done under this phase of the project, the knowledge base and software are starting to get use from DLA stakeholders. There are several avenues in which we can build on this. During discussions with stakeholders, it became clear that it might be useful to have the MUST KB and its associated tools be part of a document management system (DMS) to aid in the development of purchase descriptions and specifications. The current system was not designed as a DMS, in that it doesn't support complex workflows, commenting, and approval processes. In principle, these things could be added. On the other hand, there are existing software packages such as Microsoft SharePoint that do include these elements. Using the TexSpecs API, a SharePoint workflow could be built that reads and writes to the MUST KB, while taking advantage of existing DMS tools. We recommend exploring this route.

As discussed above, the current approach to creating and communicating interim changes is not ideal for integrating into digital document models, due to lack of standardization. Within the current TexSpecs software, it is possible to add changes interactively in a somewhat crude way. That is, the use can open a window and type in the desired change text. We recommend extending this in such a way that this window pulls in the document element to be changed and allows direct editing of this text to define the desired change.

The extraction of structured physical requirements from tabular data is seen as beneficial to the activities carried out by the DLA Product Testing Center. As mentioned above, improved scalability for requirements extraction will allow the expansion of this capability to a broader variety of items and will allow the extraction to proceed as soon as the document is added to the KB. One of the keys to this scalability will be the automatic identification of similar terms across a number of documents. Recent advances in vector representations of words and phrases provide a promising avenue for exploration. In this type of analysis, multi-dimensional vectors are used to represent words. These vectors are

automatically generated from a body of text. Words or phrases that have similar meaning will be clustered near each other in the multi-dimensional space. This and other recent NLP research should be able to help in scaling the requirements extraction process.

Throughout this phase of the project, we several informal sessions with stakeholders to get feedback on software features and KB contents. As a specific use case took shape later in the project, we developed a more formal training course for stakeholders in order to cover the procedures in detail and depth. These training sessions are designed so that attendees are getting hands-on experience during the class. We recommend following up with additional training as more use cases arise, or as more stakeholders are making use of the system.

Appendices

Appendix A: List of Acronyms

AATCC – American Association of Textile Chemists and Colorists

API – Application Programming Interface

ASTM – ASTM International (formerly American Society for Testing Materials)

C&T – Clothing and Textile

CID - Commercial Item Description

DLA – Defense Logistics Agency

DMS - Document Management System

IC – Interim Change

KB - Knowledge Base

LMI - Logistics Management Institute

MLCX - Materials Library and Collaborative Exchange

MUST – Military Unique System Sustainment Technology

NLP – Natural Language Processing

PDF – Portable Document Format

PD – Purchase Description

PGC – Product Group Code

PTC - Product Testing Center, also Parametric Technology Company

RBAC - Role-Based Access Control

SKOS – Simple Knowledge Organization System

URI – Universal Resource Identifier

XML – Extensible Markup Language

Appendix B: Functional Requirements Document

TexSpecs *Functional Requirements Document*

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Date Submitted:	January 6, 2020	
System Name:	TexSpecs/MUST KB	

Table of Contents

Introduction

Background

Technical Requirements for items managed by the DLA are defined in a complex, evolving web of specifications, standards, commercial item descriptions, and purchase descriptions. These documents cross-reference each other extensively. For instance, a purchase description for an item of clothing may reference a commercial item description for a type of thread, which in turn may reference one or more test method specifications. All of these documents are likely to be revised on a regular basis, and contracts for acquisition of items may specify departures from individual technical requirements in any or all of the relevant documents. Documents are typically saved in PDF format or as paper, which is easy to read but does not typically provide a computer-usable model to navigate references. These characteristics can make the management and use of technical requirements time-consuming and error prone.

Business Opportunity

The use of paper and/or PDF documents to disseminate technical requirements results in unconnected, "stove-piped" information. In spite of the documents being frequently updated and heavily cross-referenced, an individual working with a paper copy or a local PDF file may not be aware of revisions and updates to the core document or to critical referenced documents.

Using modern knowledge modeling techniques, it is possible to create digital models of the technical documents and their connections. This will allow users easier, faster access to the technical information they need, and will provide a means to be notified of changes to content of interest. The digital model also allows the extraction of authoritative data for re-use, without error-prone retyping, and provides a platform for sophisticated analysis of the content.

From the point of view of creators or curators of technical data, having a digital model allows enhanced change and configuration management, automatic checks for format compliance, and a faster path to document revision and coordination.

Business Objectives and Success Criteria

The use of digital models will allow improved configuration management through better communication of interim changes. Currently, end-item manufacturers receive changes separately from the main documentation and need to physically cut and paste paper notes into the documents to get an accurate picture of technical requirements. Often, they then need to transmit this information to subcontractors.

Success will be determined by the decrease in time and effort and the increase in accuracy of the information exchange.

Business Risks

The primary risks will relate to the ease of use of the product and the time involved in learning a new tool. We recognize that the potential users are not always in a position to spare extra time for learning new tools, unless there is a clear payoff in increased efficiency. We will mitigate this risk by developing training modules that allow both guided and self-paced learning of the tool.

Vision of the Solution

Vision Statement

For All users of technical requirements managed by DLA C&T

Who want to access and use the relevant requirements

The TexSpecs web interface

Is a web-based tool

That allows users to access information in the MUST KB

Unlike existing requirement documents, which only allows users to access PDF or paper versions,

New product provides more flexible, faster access to relevant requirements and tools to help manage change and configuration.

Major Features

The TexSpecs interface allows users to discover and view specifications, standards, commercial item descriptions, and purchase descriptions. It provides a number of enhancements not available in paper or PDF form. Broadly speaking, these enhancements fall into several broad categories:

- Enhanced navigation
- Change and configuration management
- Tools for re-use of authoritative content

Assumption and Dependencies

We assume that potential users are familiar and somewhat comfortable with web-based information services, and that they will be able to use browse and search capabilities with minimal training required.

Scope and Limitations

Scope of Initial Release

The initial release will include the following:

- The ability to search for documents based on designation, or by text in the title or body of the document. Results will be ranked by relevance, with text in the title being ranked higher than text in the body of the document.
- The ability to browse available documents. The browse interface will display the documents as a set of nested folders, arranged by publisher and document type.
- The system should allow for the storage, search, and retrieval of multiple revisions of a document.
- The ability to view documents in the app. Document layout should be similar to that found in print version.
- When multiple revisions of a document are on the system, it should be possible to see a "red-line" view of differences between any two revisions.
- When the application is actively carrying out a function (i.e. retrieving and displaying a document), it should show a status indicator to indicate to the user that the function is in progress.
- Internal links (to sections or tables within document) within the document view should be functional. Clicking a link to a section or table should scroll to that position in the document. Hovering the mouse over the link should show the title of the target section or table.
- A table of contents for the document should be available, even for documents that may not originally had them.
    - It should include a list of tables and a list of figures.
    - Clicking on an element in the table of contents should take you to the appropriate place in the document view.
- External links (references to other documents) should be functional.
    - Where target document is in the knowledge base, clicking the link should open the document.

    - When the target document is not in the database, the user should be given some indication on where to find it.

    - Hovering the mouse over the link should show the title of the target document, if it is in the database.

- When available, the document status should display at the top of the document. Next to the document title. This data should be updated using metadata retrieved from the ASSIST system at least once a week.

    - If the document being viewed is superseded by a new revision, that should be indicated in the status indicator.

    - If a specification is cancelled or inactivated, that should be shown in the status indicator.

    - Clicking on the document status link should provide a list of revisions of the document being viewed, with links to the documents within the portal, if available. For documents that also exist in the ASSIST system, a link should be provided to those as well.

- If a user has permission, it should be possible to download a displayed document into an MS Word file.

    - For non-government documents, the publisher should be allowed to determine whether MS Word export is available.

    - For documents controlled by MIL-STD-961E, the exported MS Word document should conform closely to the formatting requirements defined in that standard for font, font size, margins, and page headers and footers.

- The system should support the storage and display of interim changes to documents.

    - It should be possible to display the changes in the document, near the document element being changed.

    - When a document is being viewed with interim changes, export to MS Word should include those changes.

    - When there are changes applicable to the document being viewed, there should be an indicator to that effect near the top of the document view. Clicking on the indicator should list the available sets of changes for that document.

- It should be possible for users to download data from document tables into a spreadsheet-compatible file format such as CSV. This capability should be available by right-clicking on the table.

- The system should allow the user to create derivative works by including, by reference, any sub-element (section, paragraph, table, *etc.*) into a new document. The user should be able to save these derivative works in the system and share them with other users.

- The system should allow users to register to be notified by email if a new revision of a specific document is added to the system.

- It should be possible to have the system check whether or not specific MIL-STD-961E format requirements are met. The following should be included in the initial release:

    - Check that measurement system is correct and present.

    - Check that document designation is formatted correctly.

    - Check that references appearing in section 2 are referenced in section 3 and/or section 4.

    - Check that documents references in section 3 or 4 appear in section 2.

    - Check that sections 1-6 exist and are titled correctly.

    - Check that sections and paragraphs are numbered sequentially, without gaps.

- When a document is being viewed, it should be possible to get a list of all specifications that it references, and all specifications that they reference, if they are in the KB. It should be possible to get a list of all documents in the system that reference the document being viewed.

- The released system should include an Application Programming Interface (API) that enables search and retrieval functionality outside of the user interface.

    - The API should include authentication, so that end users have access to only the content and functionality that they are authorized to have.

- It should be possible to add a document to the system by uploading in XML or Microsoft Word (docx) format.

    - It should be possible to upload the document as a "draft" in order to verify quality before publishing it for wider use.
    - The onboarding process should automatically recognize references to other specifications and standards and should generate the appropriate links.
- User should have the ability to define and save collections of documents and changes.

Scope of Subsequent Releases

Future releases may include more document types, such as notices. It might also be possible to incorporate documents such as the Code of Federal Regulations.

Future releases may include the capability to author interim changes interactively.

Limitations and Exclusions

Because it depends on participation by document publishers, not all referenced documents will be available through this tool.

At this time, there is no plan for a graphic browser showing the relations between documents.

Stakeholder Profiles

The stakeholders involved in this project will be the product managers and standards team at DLA C&T in Philadelphia. These stakeholders will be able to assess the utility of the tool for management and communication of technical requirements as contained in specifications, commercial item descriptions, purchase descriptions. This communication may be within DLA, between DLA and the services, or between DLA and manufacturers who use the data. They will guide development of the user interface and will advise on the management and use of interim change data.

User Groups and Classes

Eventual users of this system will come from throughout the DLA and the services and may include any individual who needs access to specifications and related document as part of their job. In addition to those responsible for writing and managing specifications, these may be personnel involved in product design, maintenance, purchasing, or disposition.

There are three primary classes of users: consumers, authors, and publishers of technical requirements.

Most users will consume the content; that is, they will search for and read information existing in the knowledge base. In addition to searching and viewing, they will want to be able to:

- Receive notifications of updates to documents that they are using.
- Define their own collections of documents and related information.
- Extract and use structured information from the documents in their work.

Those responsible for authoring content will need to be able to add new content to the system. Those responsible for publishing will need to have control over who can see specific content.

Project Priorities

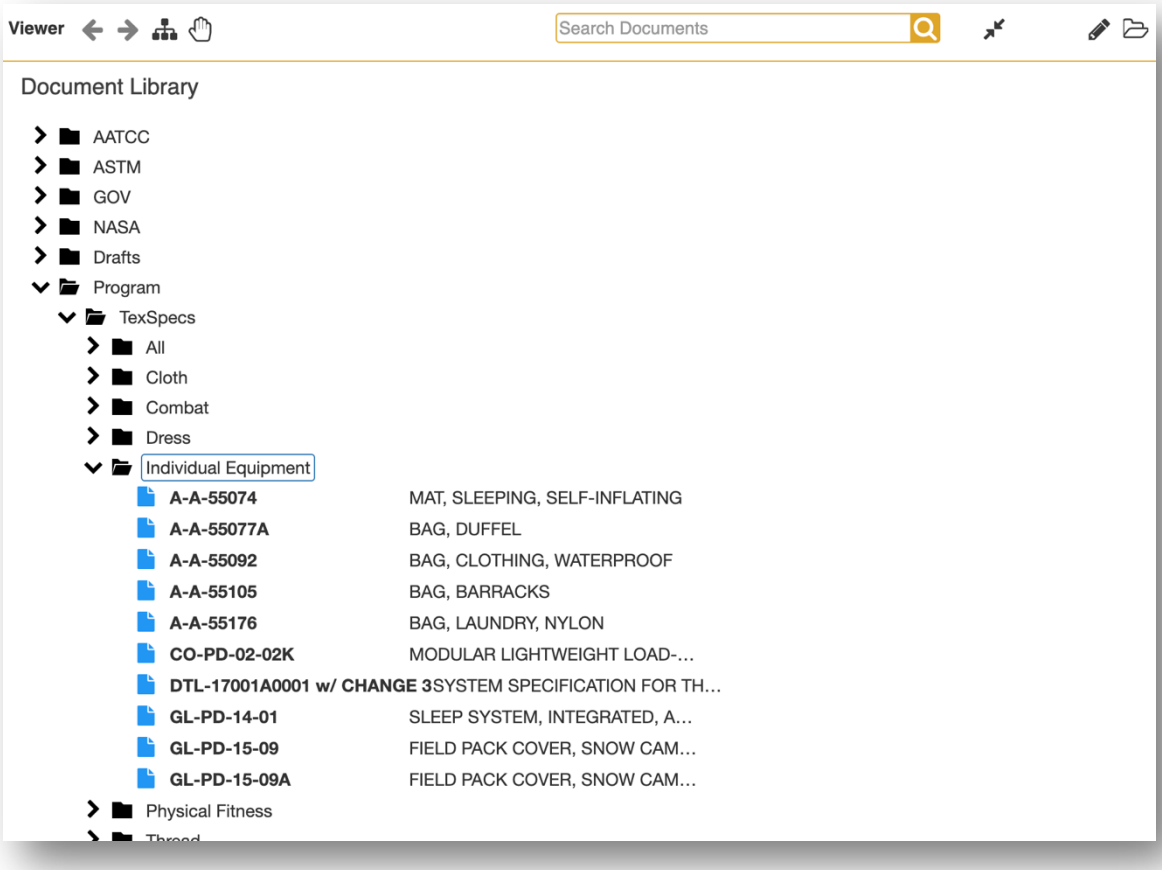
Initial stages of the project should be used to establish a storage format for documents that will allow the desired functionality to be built into the system. Database software that can support the data format and functionality will need to be identified and installed. Once this has been established, an initial set of content will need to be identified and added to the system, for testing and evaluation purposes.

The next step will be developing an API to support the functionality of the system.

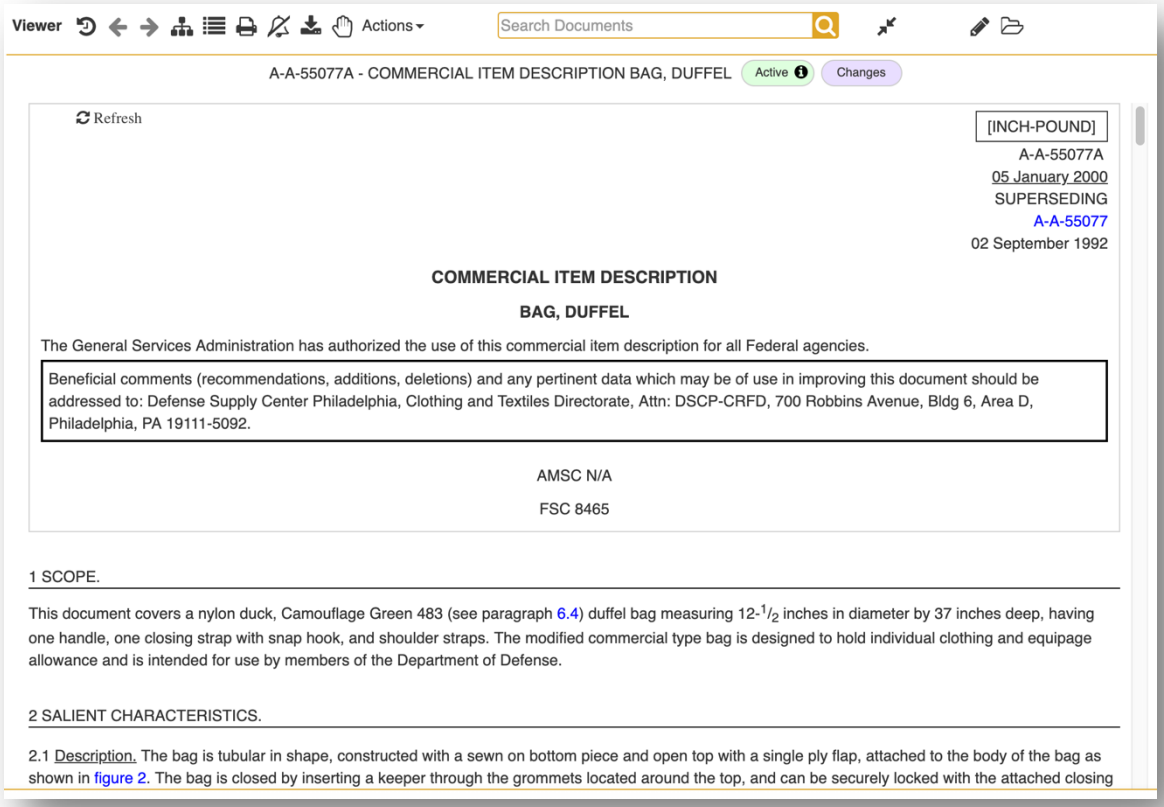
Operating Environment

The system will be centrally located at one site, on a cluster of servers. It is expected that users in many locations will want to access the system. Access to the system will be available via the World Wide Web. Performance on data retrieval should allow interactive use (no more than a few seconds for large documents). Access should be controlled; either through username/password access or by other means. Service interruptions should be minimal.

Supplementary Items

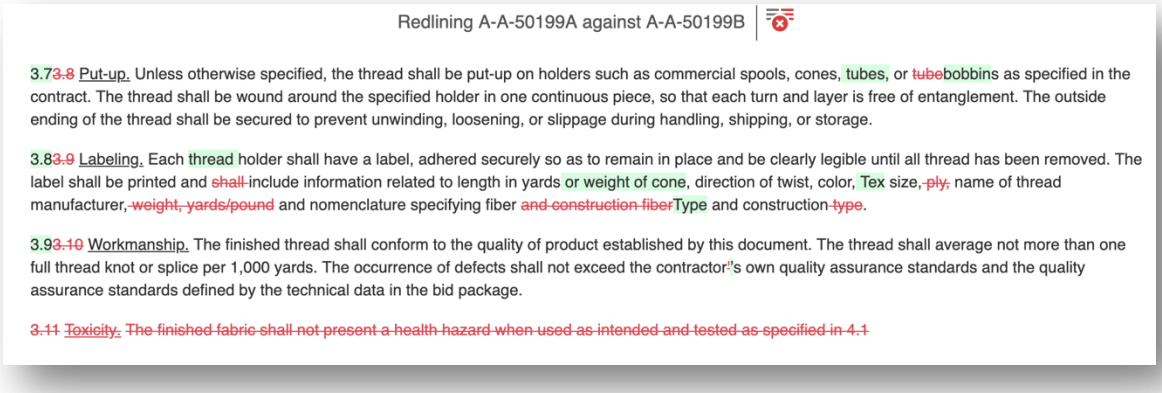


The interface should include a "tree" view of available documents, as well as an option to search for documents containing specific text.



When viewed, the documents should be formatted similarly to how they appear in printed form. Controls for additional actions should be available above the document view. Indicators at the top of the document should show the document status and whether or not interim changes to the document exist.

When the system contains more than one revision of a document, a red-line version as shown below should be available.



Appendix B: Detailed Functional Requirements

Requirements

Requirement ID	Requirement Definition
ADM0001	The system shall allow users with administrator role ("administrators") to see a list of users that he or she can administer.
ADM0002	The system shall allow administrators to activate users that are inactive.
ADM0003	The system shall allow administrators to de-activate users that are active.
ADM0004	The system will allow administrators to grant the following roles to users: "User", "Author", and "Publisher".
ADM0005	The system will allow administrators to revoke the following roles from users: "User", "Author", and "Publisher".
ADM0006	Users with role "User" will be able to view all non-draft documents and interim changes in the MUST KB.
ADM0007	Users with role "Author" will be able to on-board documents as drafts.
ADM0008	Users with role "Publisher" will be able to "publish" draft documents, making them visible to all MUST users.
ONB0001	The system shall provide the ability to load a new document or update an existing document in the system.
ONB0002	The system shall provide the ability to load interim changes to documents in the system, from a file formatted in MS Word.
ONB0003	The system shall allow users to onboard documents in a draft state. Draft documents will not be discoverable via search, will not be used in calculating references to/from other documents, and will not overwrite non-draft documents.
ONB0004	The system shall allow users with the appropriate permission to publish a draft (make it visible to all users) or delete it.
API0001	The system shall include an Application Programming Interface (API) that enables search and retrieval functionality outside of the user interface.

API0002	The system shall provide for data exchange of extracted structured attributes to third party systems via the API.
API0003	The system shall provide the ability to retrieve document metadata via the API. Metadata should include document designation, title, and publication date.
API0004	The system shall provide the ability to retrieve a document in HTML or XML format via the API.
CCM0001	The system shall allow for the storage, search, and retrieval of multiple revisions of a document.
CCM0002	Within the document view, the system will display the document status indicator (when available from ASSIST meta data: active, inactive, or cancelled, and superseded if newer version of document exists).
CCM0003	The system shall provide the ability for users to register to be notified by email if a new revision of a specific document is added to the system
CCM0004	When multiple revisions of a document are on the system, it shall be possible to see a "red-line" view of differences between any two revisions
FMT0001	Within document view, the system shall provide the ability to check whether specific MIL-STD-961 format requirements are met and report specific valid and/or invalid elements.
ICS0001	The system shall provide the ability to display a list of interim change documents and the document(s) they have changes for.
ICS0002	The system shall provide the ability to display interim changes to documents. The changes in the document will display near the document element being changed.
ICS0003	The system shall provide the ability to download a document with interim changes integrated within the document.
ICS0004	The system shall provide the ability to interactively enter individual interim changes from within the document view.
ICS0005	The system shall periodically add interim changes from publicly available electronic sources (EFOIA)
NAV0001	The system shall provide the ability to display a "Tree" view of available documents in the system.
NAV0002	The system shall provide the ability to search for documents based on designation, or by text in the title or body of the document.

NAV0003	The system shall provide a history of the user's previously viewed documents during a session and allow them to select a previously viewed document for viewing.
DOC0001	Within the document view, the system shall provide the ability to view a system generated table of contents, listing sections, tables and figures. Within the table of contents, each entry will link to the given document location.
DOC0002	Within the document view, the system shall provide the ability to link to internal sections, tables, or footnotes within document. Clicking a link to a section, table, or footnote should scroll to that position in the document.
DOC0003	Within the document view, the system shall provide the ability to link to external referenced document. Clicking a link to a referenced document should search and either open that document in document view or provide some indication of where it can be found.
DOC0004	Within the document view, the system shall provide the ability to display a list of referenced documents. Each listed document shall link to the document itself.
DOC0005	Within the document view, the system shall provide the ability to display a list of documents that reference the document in view. Each listed document shall link to the document itself.
DOC0006	Within the document view, the system shall provide the ability to display a list of referenced documents which reference test documents, along with their referenced tests. Each listed document shall link to the document itself.
DOC0007	When the application is actively carrying out a function (i.e. retrieving and loading a document), it should show a status indicator to indicate to the user that the function is in progress
EXP0001	The system shall provide the ability to download a displayed document in MS Word format.
EXP0002	The system shall provide the ability to download document tables into spreadsheet-compatible file format.
EXP0003	The system shall provide for 'round-trip' MS Word file onboarding and exporting. MS Word documents onboarded into SWISS shall be downloaded in the same format they were onboarded. A document downloaded and then onboarded shall be able to be downloaded in the same format as it was initially downloaded.
REQ0001	The system shall provide the ability to display structured requirements data taken from document tables, including subject text, subject id, attribute text, attribute id, value text, source (table id).

USR0001	The user should have the ability to define collections of documents and changes and save the information for future use.
USR0002	The user should have the ability to create and store a derivative work, which can include by reference any element from any document that he or she has access to.

Appendix C: Task 1.1 Milestone Report - 18-Jun-2018 - Word On-Boarding: Initial "Push-Button Prototype"

We report on the initial implementation of a tool that allows MS Word documents to be on-boarded to the MUST KB. The degree to which a user-supplied document needed to be prepared is discussed.

Word On-Boarding: Initial "Push-Button Prototype"

Contract SP4701-14-D-7006, Delivery Order SP4701-18-F-0045
Task 1.1
Milestone: "Report on initial “push button” prototype and evaluation using stakeholder-supplied documents"

XSB, Inc.
June 18, 2018

Background

In previous phases of the MUST project, it became clear that stakeholders would like the ability to on-board documents, specifically Purchase Descriptions, to the MUST/TexSpecs knowledge base. Combined with the previously-implemented ability to export documents from TexSpecs to Word, this would provide a "round-trip" capability for generating new document revisions.

We have in the past explored the use of the Inera eXtyles plug-in for Word, which helps users create standardized XML files that can be added to the knowledge base. This software does take some training and skill to operate, however, and may not be available in all situations. As an alternative, we are investigating a "push-button" approach that will allow any Word document to be on-boarded, if it follows certain formatting guidelines.

Document Format

Within the MUST/TexSpecs knowledge base, it is important to understand the document hierarchy. That is, we want to know when a specific element is "part of" a parent section, or when two adjacent elements are part of a list. The Word software makes it straightforward to create a document in such a way that these relationships can be understood by another computer program, which is what we need in order to transform it to the TexSpecs format.

For example, top-level section headers can be tagged with a "header" style, and these headers can be nested (header1, header2, etc.) to indicate hierarchy. Lists and tables have their own styles associated with them.

Certain document elements common to purchase descriptions and specifications may not have direct corollaries in the Word style elements. These would include front-matter elements such as measurement system and document designation. However, because these are consistently formatted from document to document, and appear in a specific

place in the document, we can write the software in such a way as to recognize and convert them correctly.

Another feature of purchase descriptions and similar documents is to have sub-section (or paragraph) numbers and titles in-line with the text of the paragraph. This can make it harder to apply a "header"-type style. Again, however, because this is consistent from document to document, we can write the software in such a way as to recognize the structure and hierarchy represented by these formats.

In many test cases, very little re-formatting was needed to get the original document in a state that would on-board correctly.

Example

The figures on the following pages show an example of a Purchase Description supplied as a Word document by stakeholders, and the resulting uploaded draft using the "push-button" system. Only a small handful of modifications to the Word document were needed to get the correct result, specifically:

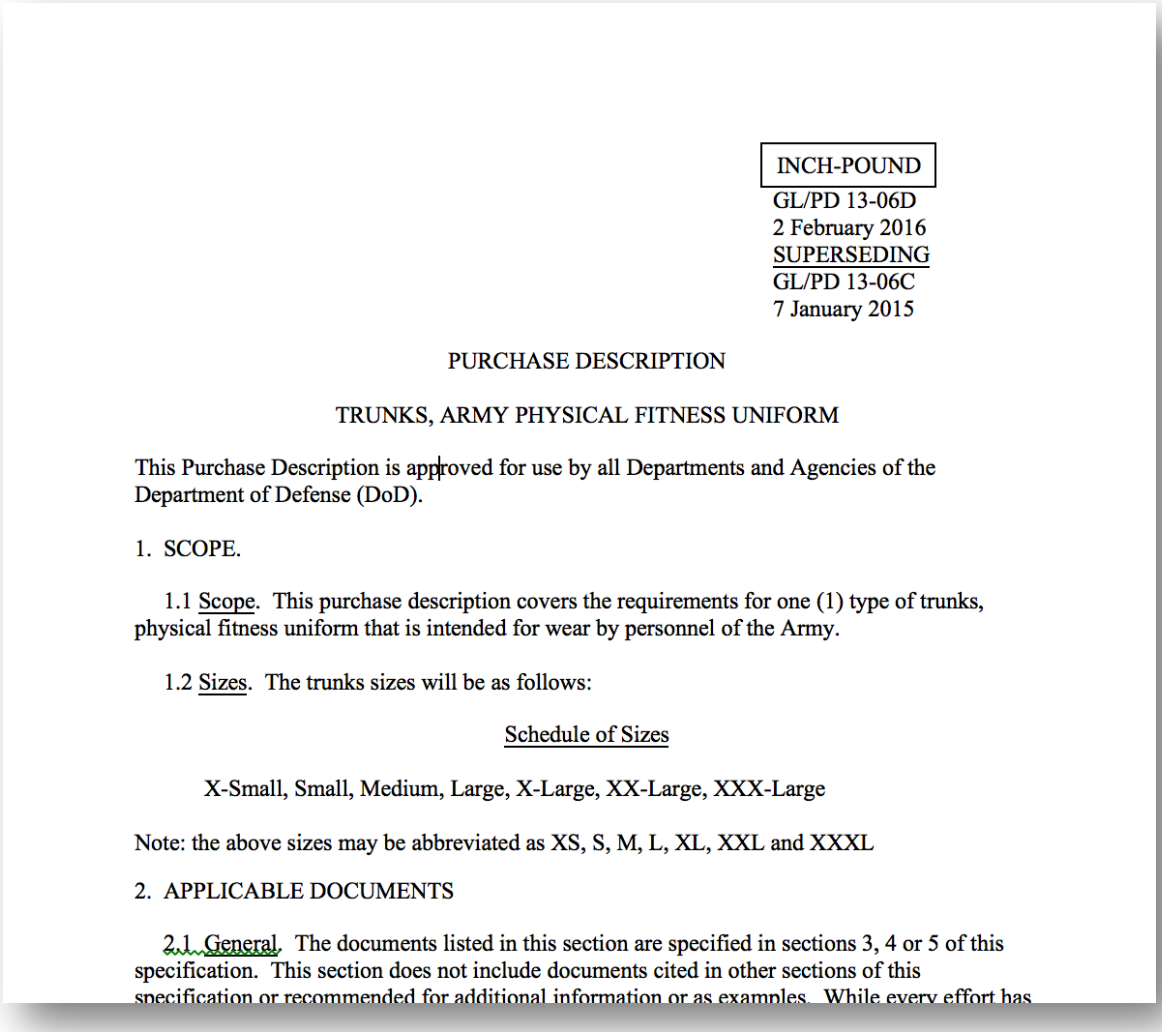
- Stand-alone section headers, such as "1. SCOPE", were tagged with "Header" style in Word.
- Table and figure captions were tagged as such.
- Figures were converted from "TIFF" to "PNG" format (note, we will consider handling this in a more automated way in future releases).

As can be seen in the second figure, the front matter and body sections were correctly interpreted during the conversion.

Next Steps

We will be making the on-boarding tool available to stakeholders beginning in July, and will evaluate results and modify the tool as needed. As part of this evaluation, we will provide the stakeholders with a sample template. A key goal of this process will be to make sure that all elements such as lists, tables, footnotes, etc. are correctly translated in the conversion with a minimum amount of intervention from the user. We also want to work to ensure that the proper amount of feedback is provided when the conversion is not carried out as expected.

Figure C.6: Original Word document



INCH-POUND
GL/PD 13-06D
2 February 2016
SUPERSEDING
GL/PD 13-06C
7 January 2015

PURCHASE DESCRIPTION

TRUNKS, ARMY PHYSICAL FITNESS UNIFORM

This Purchase Description is approved for use by all Departments and Agencies of the Department of Defense (DoD).

1. SCOPE.

1.1 Scope. This purchase description covers the requirements for one (1) type of trunks, physical fitness uniform that is intended for wear by personnel of the Army.

1.2 Sizes. The trunks sizes will be as follows:

Schedule of Sizes

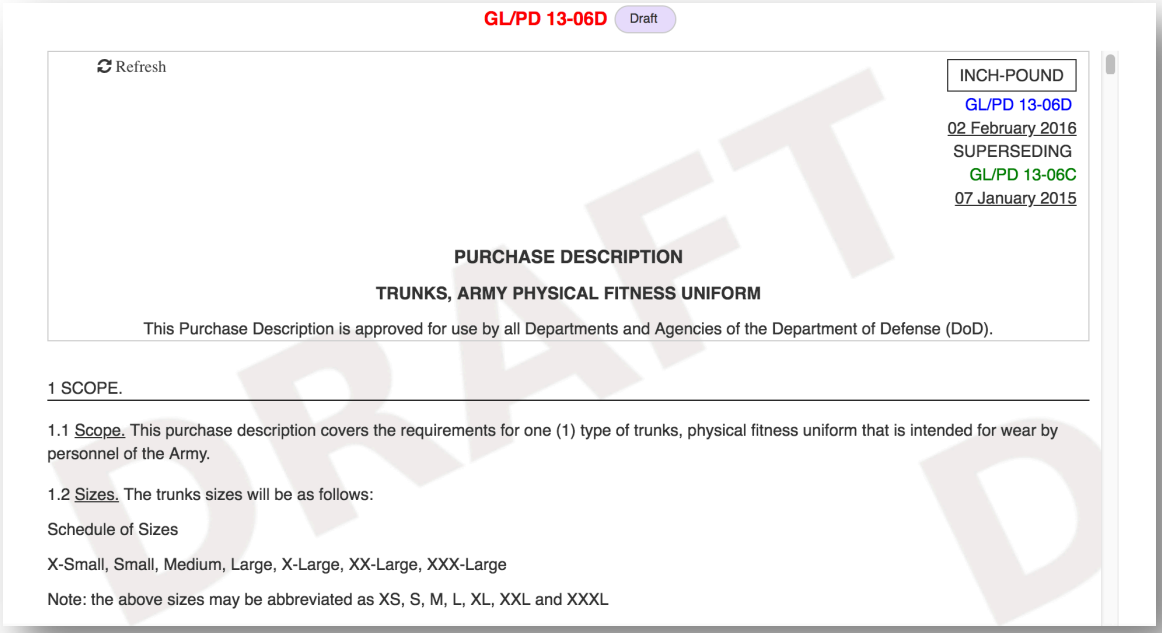
X-Small, Small, Medium, Large, X-Large, XX-Large, XXX-Large

Note: the above sizes may be abbreviated as XS, S, M, L, XL, XXL and XXXL

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4 or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has

Figure C.7: As loaded into MUST/TexSpecs system



Appendix D: Task 1.1 Milestone Report - 18-Apr-2019 - Word On-Boarding: Go/No Go Decision on Inera eXtyles

We report on the decision to not pursue the use of Inera eXtyles for the MS Word on-boarding workflow, based on the success of direct onboarding.

Word On-Boarding: Go/No Go Decision on Inera eXtyles

Contract SP4701-14-D-7006, Delivery Order SP4701-18-F-0045
Task 1.1
Milestone: "Go/no-go decision on the use of Inera eXtyles by one or more stakeholder groups"

XSB, Inc.
April 18, 2019

Background

In previous phases of the MUST project, it became clear that stakeholders would like the ability to on-board documents, specifically Purchase Descriptions, to the MUST/TexSpecs knowledge base. Combined with the previously-implemented ability to export documents from TexSpecs to Word, this would provide a "round-trip" capability for generating new document revisions.

We have in the past explored the use of the Inera eXtyles plug-in for Word, which helps users create standardized XML files that can be added to the knowledge base. This software does take some training and skill to operate, however, and may not be available in all situations. As a result, we have under this Delivery Order been exploring the use of a "push-button" document on-boarding capability that would allow the use of MS Word as a document preparation tool without the need for additional plug-ins. If this approach was found to be feasible, we would decide not to further pursue eXtyles as a recommended option.

Results

As has been reported previously under this delivery order, the ability to on-board Word documents has been successfully implemented. The primary challenge to overcome in this approach is the ability to handle the variety of structures that users may include, and successfully translate them into the format used by the MUST KB. In recent months we feel that we have met this challenge to a degree that continued work with eXtyles is not needed under this delivery order. It should be noted that eXtyles is still very much an option for users that would like to use it, in that it creates XML files in a format compatible with the MUST KB.

Appendix E: Task 1.2 Milestone Report - 18-Jun-2018 - Proposal for User-Managed Role-Based Access Model in TexSpecs

This report outlines the initial elements needed in a role-based access model.

Proposal for User-Managed Role-Based Access Model in TexSpecs

XSB, Inc.
June 18, 2018

In the early phases of the MUST TexSpecs project, user account administration and authorization has been done by XSB. As we develop the capability for users to edit and upload documents back into the system, it will be necessary for stakeholder groups to have some say in who can carry out various functions such as adding draft Purchase Description (PD) documents and determining when these drafts should be "published". Over the coming months, we will be extending and improving our role-based access and authentication model to allow stakeholders to manage permissions on documents that they bring into the system. Our goal is to have the functionality in place by mid-September, 2018.

During the design phase of this effort, we are soliciting feedback from users on whether the proposed approach will meet their needs.

Based on feedback from users, we have added some functionality related to interim changes. These are shown in italics in the following.

There will be four roles defined: User, Author, Publisher, and Administrator. Actions available to each role will be the following:

User:

- Can search for and view defined set of docs (for TexSpecs users, this will include government specs, standards, commercial item descriptions, and “published” purchase descriptions).
- Can search for and view “public” interim changes.
- Can create/view/edit/delete compositions and *"user-type"* interim changes.
- Can grant view of created compositions and interim changes to other *individual* users.

Author:

- All of User role abilities.
- Can export government documents (including purchase descriptions) to MS Word.
- Can onboard and view draft PD documents.
- Can delete own draft PD documents.
- *Can onboard and view draft "DLA-type" interim changes*.

Publisher:

- All of Author role abilities.
- Can delete any draft PD.
- Can publish draft PD (that is, add to public PD collection that can be viewed by anyone with "User" role.)
- *Can publish draft interim changes for use by all MUST/TexSpecs users.*

Administrator:

- All of publisher role abilities.
- Can manage users (add, assign role, change password, delete).

As an added clarification, it should be noted that all roles operate within a given domain, and over a specific set of data. Within the MUST program, authoring and publication will be restricted to Purchase Descriptions and Interim Changes (that is, revisions to Specification and Commercial Item descriptions will not be allowed). Functions assigned to those with administrator access will likewise be restricted to the MUST/TexSpecs domain.

Appendix F: Task 1.3 Milestone Report - 18-Apr-2018 - Initial Authoring Tool Interface Requirements

In collaboration with LMI, we worked to define what was needed to integrate the MUST KB with a proposed Spec Authoring Tool.

Initial Authoring Tool Interface Requirements

Contract SP4701-14-D-7006, Delivery Order SP4701-18-F-0045
Task 1.3
Milestone: "Initial requirements document for data input interface."

XSB, Inc.
April 18, 2018

MUST partner LMI, in collaboration with GraphGrid, is developing a specification authoring tool. This tool will be able to retrieve legacy information from the TexSpecs knowledge base, and will be able to store newly created documents in the knowledge base.

Under the current Delivery Order, XSB, Inc. is providing an application programming interface (API) for communication between the authoring tool and the knowledge base. Over the past two months, XSB has consulted with LMI and GraphGrid to determine the initial functionality needed in this interface.

In the following, "URI" refers to Universal Resource Identifier, which the TexSpecs system uses to uniquely identify documents and other resources.

It was determined that the document exchange format between the tool and the KB would be ISO-STS XML, and that the following initial functionality was needed:

- Data discovery: Authoring tool needs to be able to find document URI based on document designation.
- Metadata retrieval: Authoring tool needs to be able to get document metadata (designation, title, publication date, etc.), based on URI.
- Document download: Authoring tool needs to be able to retrieve document data in XML format, based on URI.
- Document upload: Authoring tool needs to be able to on-board an authored document into the knowledge base by providing it in XML format.

It is expected that the last point will be further refined based on decisions about the document workflow. In particular, it may be desirable to have separate steps for onboarding "draft" versions of the document with limited visibility, and for publication, which would finalize the document version and make it available to the public. Furthermore, we are in the process of enhancing the upload with functionality to check the incoming file for compatibility with the TexSpecs model.

As of this writing, the GraphGrid/LMI team is testing the existing API, which includes the functionality discussed above.

Appendix G: Task 2.1 Milestone Report - 16-Mar-2018 - Initial Vocabulary for Requirement Extraction in TexSpecs

An essential part of the requirement extraction under this Delivery Order is the development and curation of a standardized vocabulary for reporting the extraction results. This report describes the initial set-up of that vocabulary.

Initial Vocabulary for Requirement Extraction in TexSpecs

Contract SP4701-14-D-7006, Delivery Order SP4701-18-F-0045
Task 2.1
Milestone: "Initial vocabulary for guiding machine learning developed."

XSB, Inc.
March 16, 2018

As part of the enhancement of requirements extraction being carried out under the current Delivery Order, we have been extending and improving the controlled vocabulary that will be used to characterize structured requirements. This vocabulary will be used to help define training data for any ongoing machine learning efforts. As part of this process, we have also evaluated tools and procedures for curation and maintenance of vocabularies, as it could be desirable, in the future, to involve subject matter experts in managing this data.

Background

At the end of the previous delivery order, we had developed a simple vocabulary based on common terms in text extracted from purchase description documents (in the following, we will refer to this as the "PD Vocabulary"). This was combined with a vocabulary extracted from the ASTM terminology document ASTM-D123 "Standard Terminology Relating to Textiles". For structured requirements, we want to associate the subjects and attributes with elements in the known vocabulary. This helps ensure consistency within and between documents, even when a given concept may be expressed in a number of ways in the document text. The vocabularies are modeled in the knowledge base using the Simple Knowledge Organization System (SKOS), a World Wide Web Consortium (W3C) standard. Altogether there are 405 terms in the PD vocabulary, and 1721 in the ASTM vocabulary. In terms of the subjects associated with extracted requirements so far, roughly two thirds have been from the PD vocabulary and one-third from the ASTM vocabulary.
In addition to the terms found in these standard vocabularies, the subjects of requirements may be expressed as a type or class of item (for instance "Type I cloth"). We have used technologies previously developed at XSB to recognize these references and associate them with the extracted requirements.

Enhancement of the PD Vocabulary

In order to make best use of the vocabulary, additional elements are needed that were not addressed in the initial work. This effort has been undertaken over the last few months. There are three primary components to this phase of the work: adding or editing alternate forms of the concepts, defining relationships between concepts, and enhancing concept definitions. These efforts are important to ongoing use and maintenance of the vocabulary.

In the SKOS system, a concept can have a "preferred" label along with any number of "alternate" labels. These labels are used to recognize alternate forms of a given concept, and are used in our system to make sure that a subject or attribute is correctly tagged. For instance, we want to recognize "hook and loop tape" and "hook and loop fastener tape" as the same concept, so we assign one as the preferred label and one as the alternate label. For our purposes, which label is called "preferred" and which is called "alternate" is not crucial, but it is in general best to have the most common wording be the preferred label. Overall, we added alternate labels to just over 10% of the terms in the PD vocabulary, and expect to add more as the need arises.

Defining relationships between concepts is expected to be useful in discovery and navigation of structured requirement data. In SKOS, we can define relationships such as "broader" and "narrower". For example, we define "thread" to be a broader term than "bobbin thread". This way, in future applications, we have the option of including requirements for bobbin thread when the request is "give me all requirements related to thread". At the present time, we have identified just over 100 relationships between terms in the PD vocabulary.

The other major enhancement of the PD vocabulary in recent months was to add definitions to the concepts. This is important in removing ambiguity when there might be similar labels that refer to different concepts in different domains. (For example, "thread" in clothing versus "thread" in nuts and bolts). Access to these definitions will be added to the display of structured requirements in upcoming releases of the web application. Definitions have been added for 347 of the 405 concepts in the PD vocabulary.

Type/Grade/Class Definitions

As mentioned above, in addition to the PD and ASTM vocabularies, we also recognize "type/grade/class" references as valid requirement subjects. In order to associate these references with definitions, we have developed procedures for automatically finding these definitions within the document text. To do this, we make use of the fact that the definitions are typically given in a paragraph labeled "Classification" in the opening section of the document. As with the PD vocabulary, we expect to make these definitions available through the requirement display.

Vocabulary Curation Tool

In order to manage domain-specific vocabularies in the future, it will be necessary for domain experts to have access to tools that allow them to view and edit the data. As part of the current effort we made use of a free tool called "Mobi" (https://mobi.inovexcorp.com/). This tool allows collaborative editing of SKOS vocabularies as well as more complex ontologies.

Conclusion

We have extended and improved the vocabulary that will be used as a basis for machine learning tasks. These improvements will also enhance the end user experience as the vocabulary is made part of the user experience. Throughout the remainder of the project, we anticipate making further improvements as needed.

Appendix H: Task 2.1 Milestone Report - 17-Aug-2018 - Integration with LMI Authoring Tool and PTC Test Validation Tool

Under this Delivery order we are working with MUST partners to integrate the MUST KB with two tools: Spec Authoring and PTC Test Validation. This milestone report describes the initial plans and progress for these integrations.

Integration with LMI Authoring Tool and PTC Test Validation Tool

Contract SP4701-14-D-7006, Delivery Order SP4701-18-F-0045
Task 2.1
Milestone: "Report on plans for integration with LMI authoring tool and PTC test validation tool"

XSB, Inc.
August 17, 2018

Integration with LMI Authoring Tool

XSB has been working with LMI and GraphGrid and has made the current TexSpecs Application Programming Interface (API) available. Using the API, the authoring tool software can carry out the following functions:

- Use lookup feature to get the Universal Resource Identifier (URI) of a specification in the knowledge base.
- Use the URI to get document metadata (date, title, etc.) from the knowledge base.
- Use the URI to get the complete document in XML format for use in Authoring Tool.
- Send document as XML to be stored in the knowledge base.

The next step will involve making sure the workflow needed by the authoring tool can be implemented through the API. That is, will incremental updates be needed, and if so how should we represent them in the knowledge base. Our working assumption is that we will use a draft/publication model, already available in the API. Under this approach, incremental updates can be made to a “draft” version of the document, which is only visible to the author or a small workgroup. Once the document is finalized, it would be “published” to a wider audience, and incremental updates would be disabled.

In addition to workflow questions, we will be working with LMI and GraphGrid to determine the degree to which semantic data will be exchanged. This data, consisting of structured requirements, would use the same formats used in the PTC Testing Tool collaboration. These formats are discussed in the next section of this report.

Integration with PTC Test Validation Tool

One of the goals of the TexSpecs/MUST project is to extract structured information about requirements from specification or purchase description documents, in order to make use of this information in tools such as the PTC testing software being developed by LMI. In its simplest form, the key parts of the structured data are subject, attribute, and value. For instance, in the sentence “the basic material shall have a minimum breaking strength of five pounds”, then the subject is “basic material”, the attribute is “minimum breaking strength”, and the value is “five pounds”. Note that this could also be interpreted as attribute is “breaking strength” and value “five pounds minimum”, so any extraction and retrieval system should be flexible enough to be able to translate between these options. We should also be able to translate text values to a controlled vocabulary, so that a common understanding of terms like “breaking strength” is used, and physical values such as “five pounds” can be broken down into constituent parts (number and unit, in this case).

In addition, requirements will also often contain phrases such as “when tested in accordance with paragraph 4.4” or “when tested in accordance with ASTM-A123”, and we want to be able to associate that verification reference with the requirement.

Based on the needs of the PTC tool, we are focusing this effort on extracting tabular data from the purchase descriptions, as this is the source of the information used in testing. This will enhance the extraction currently done from narrative text (i.e. document paragraphs).
At present, the API will return requirements extracted from narrative text, and includes the following information for each requirement:

- The requirement URI (unique identifier)
- The requirement source data, which includes the following:
    - Document URI
    - Document Label
    - Paragraph URI
    - Paragraph Label
    - Paragraph Title
- The text of the requirement sentence.
- The text of the subject phrase.
- The URI of the subject in the controlled vocabulary, if found
- The label of the subject in the controlled vocabulary, if found
- The URI, label, and title for the link to verification data, if found

We have developed software to extract structured requirements data from “material properties” tables. This data is not currently accessible through the API; this will be added in the September release. In addition to the information outlined above, the table extraction finds attribute and value data, so the following additional information will be returned for requirements extracted from tables:

- Attribute text
- The URI of the attribute in the controlled vocabulary, if found
- The label of the attribute in the controlled vocabulary, if found
- Value text
- Value units

The September release will not include verification links from tables. These will be added in December. For the December release, we will also refine the technical data returned to more closely match what is needed for the PTC tool. This will involve two tasks. The first will be to make sure that the controlled vocabulary for attributes either matches or can be mapped to the set of attributes used by TexBase. Secondly, we will want to process the text of the attribute and value fields to the extract numeric, unit, and tolerance values needed for the tool.

List of Physical Fitness products and related fabrics

Physical Fitness Purchase Descriptions

Document	Service	Name and PGC
CG-PD-15-21	Coast Guard	CG Sweatshirt - 02308
CG-PD-15-22	Coast Guard	CG Sweatpants - 02309
CRFD-02359A	Marine	MC Sweatpants - 02359
CRFD-02360	Marine	MC Sweatshirt - 02360
CRFD-PD-04-08E	Air Force	AF IPTU, Jacket - 03986
CRFD-PD-04-10E	Air Force	AF IPTU, Pants - 03987
FQSE-PD-08-05A	Marine	MC Running Suit, Jacket 03410
FQSE-PD-08-06A	Marine	MC Running Suit, Pants 03411
GL/PD 13-04B	Army	Jacket unisex – 03990
GL/PD 13-05A	Army	Pants wmns – 03989
GL/PD 13-06D	Army	Trunks - 03982
GL/PD 13-07A	Army	T-shirt, SS – 03983 T-Shirt, LS – 03984
GL/PD 13-08B	Army	Jacket wmns – 03991
GL/PD 13-09A	Army	Pants unisex – 03988
NCTRF-PD-16-15A	Navy	PGC 03616 Navy PT Shirt
NCTRF-PD-17-15A	Navy	PGC 03524 Navy PT Short 6in PGC 03525 NAVY PT Shorts 8in

In addition to the items listed above, we have received interim change documents that add requirements to FQSE-PD-08-05A and FQSE-PD-08-06A for Navy running suit jacket and pants.

Related Fabrics

Document	Service	Fabrics
CG-PD-15-21	Coast Guard	Basic material – Jersey knit cotton/polyester
CG-PD-15-22	Coast Guard	Basic material – Jersey knit cotton/polyester
CRFD-02359A	Marine	Basic material – Jersey knit fleece, cotton/polyester
CRFD-02360	Marine	Basic material – Jersey knit fleece, cotton/polyester
CRFD-PD-04-08E	Air Force	Basic material – 100% polyester Lining – 100% polyester mini-mesh
CRFD-PD-04-10E	Air Force	Basic material – 100% polyester Lining – 100% polyester mini-mesh
FQSE-PD-08-05A	Marine	Basic material – 100% Nylon Lining – Warp knit AMY/Sorbtek Polyester
FQSE-PD-08-06A	Marine	Basic material – 100% Nylon Lining – Warp knit AMY/Sorbtek Polyester
GL/PD 13-04B	Army	Basic material – plain weave 100% nylon V-stripe material – plain weave 100% nylon Lining – mini-mesh nylon Pocketing – Medium weight brush fabric Interlining – In accordance with MIL-C-44296
GL/PD 13-05A	Army	Basic material – plain weave nylon
GL/PD 13-06D	Army	Shell material – plain weave polyester Liner – polyester/spandex Side panel – polyester/spandex
GL/PD 13-07A	Army	Basic cloth – 100% low-pill polyester Neckband and cuffs - 100% low-pill polyester
GL/PD 13-08B	Army	Basic material – plain weave 100% nylon V-stripe material – plain weave 100% nylon Lining – mini-mesh nylon Pocketing – Medium weight brush fabric Interlining – In accordance with MIL-C-44296
GL/PD 13-09A	Army	Basic material – plain weave nylon
NCTRF-PD-16-15A	Navy	Basic cloth – 100% low-pill polyester Neckband and cuffs - 100% low-pill polyester
NCTRF-PD-17-15A	Navy	Basic material – plain weave 100% nylon Liner - 100% polyester micro denier crepe knit

Appendix I: Task 2.1 Milestone Report - 18-Dec-2018 - Metrics for Requirement Extraction in TexSpecs

In this report we look at a set of metrics for assessing the accuracy of extracted semantic information.

Metrics for Requirement Extraction in TexSpecs

Contract SP4701-14-D-7006, Delivery Order SP4701-18-F-0045
Task 2.1
Milestone: "Results of ML extraction integrated into knowledge base. Report on metrics."

XSB, Inc.
December 18, 2018

In order to support the Product Testing Center (PTC) reporting tool, we are focusing our data extraction efforts on the fabrics associated with Physical Training (PT) uniforms. An integral component of the relevant data is contained in tabular form in the related purchase descriptions.

Background

Our focus in this phase of the project has been to extract, as accurately as possible, requirements data for item materials where it is represented in tabular form. There where 25 materials identified in 14 purchase descriptions, as listed in the appendix.

In a previous report, we discussed using machine learning to classify and identify the tables from which data should be extracted. Because the actual number of tables is small in this instance, and the importance of getting the right information for the PTC tool in a timely manner, we have put the classification effort on hold. This has allowed focus on the extraction of data from manually identified tables.

In order to be useful to the PTC reporting tool, we are extracting the following information for each individual requirement: subject, source, attribute, value, and test reference. The value information may include units and a “min/max” indicator.

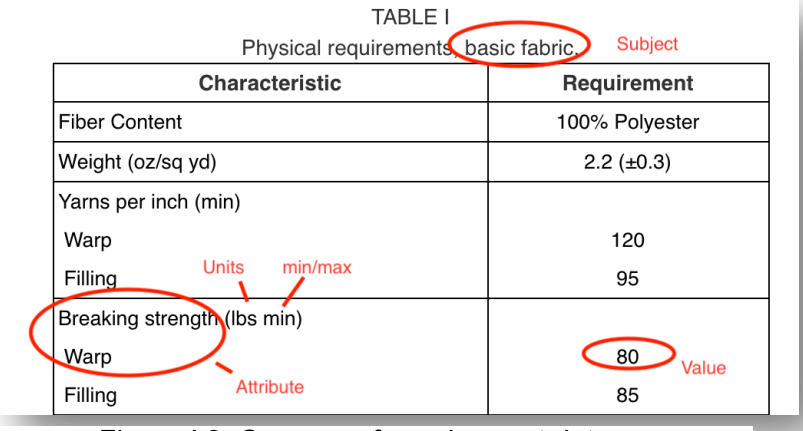


Figure I.8- Sources of requirement data

In some cases, the verification reference is in the same table as the other information, and in others it is in a separate table.

Because different documents may use different nomenclature for the same attribute, we are matching extracted attributes to a set of standardized attributes, where possible. This step will be vital to allowing TexBase to integrate the information in the PTC tool. We do not currently have the list of TexBase attributes but anticipate that mapping from one standardized list to another will not be difficult.

As of our latest software release, the extraction is producing useful results. Due to idiosyncrasies in how tables are constructed, however, there are some additional spurious requirements extracted, and some where a portion of the information is missing or incorrect. All of the issues are resolvable with reasonable further effort, and we will address them over the next few months. The following section will report on the quality metrics for the current extraction. In the concluding section we will discuss the plans and approach for improving the data going forward.

Extraction Metrics and Discussion

Altogether, 486 individual requirements were extracted from the table. Of these, 398 had attributes that matched to the standardized list, and 88 had attributes that did not match. In almost all cases, the non-matching attributes corresponded to “sub-table” structures within the table. Typically, in the documents considered under this task, this occurs as part of a water or oil repellency test, and the sub-table lists number of launderings.

Staining (Nylon)	3.5
* Water Repellency: Spray Test	Performed once (see * below)
100 launderings	
Initial	100
10	100
20	100
30	100
40	100
50	100

Figure I.9- Portion of table showing "sub-table" for water repellency test.

At the present time, our extraction is identifying the numbers of launderings (initial, 10, 20, etc.) as attributes which is clearly incorrect. However, the API only returns requirements where the attribute is recognized in the standard vocabulary, so these cases are not returned.

For the 398 requirements that can be returned by the API, we carried out a detailed analysis of 98 extracted requirements for six materials in three documents. Because the table structures used are similar from document to document, this should be a fair representation of the overall results. We determined recall (ability to find a value in the data) and precision (percentage of retrieved values that are correct). For requirements as a whole, the recall was 0.98 (98 requirements found out of 100 possible), and the precision of 0.63 (37 percent of the extracted requirements have an issue in attribute, value, or test reference retrieval).

The issues found in requirement details break down as follows (note that several requirements had issues in more than one category):

- All subjects correctly identified.
- Six attributes mis-identified
    - Information was spread across several table rows and not correctly identified.
- Eighteen values incorrectly extracted
    - In eleven cases, units or min/max value not identified
    - In seven cases, information from wrong table row associated with attribute.
- Twenty-one test references missing or mis-identified.
    - Sixteen missing
    - Five mis-identified

There are three primary causes of error:

- Information was spread across several rows and not correctly identified. While we correctly identify these patterns in most cases, we are still missing some of them.
- Units or min/max information occurs in the table cell with the numeric value and are not identified.

- For cases where verification reference is in a separate table, the attribute in the second table is not matched with the one in the first (this happens, for instance, where multiple attributes for warp/filling are combined on one line in the verification table).

Next Steps

The quality of the data being returned clearly needs improvement, and we believe we can achieve better results over the next two or three months by focusing on the areas identified in this analysis. Specifically, we will work to resolve issues where multi-line attributes are not correctly identified. We will improve recognition of units and min/max indicators in value fields, and we will improve the matching of attribute information between different tables. This latter step will include better algorithms for matching of extracted text with the controlled vocabulary.

Finally, in the coming months we will want to work closely with partners including LMI, TexBase, and PTC to make sure we are characterizing and modeling the information in a way that works for everyone. To a certain degree, this will impact the approach we take to resolve issues. For example, in the water repellency example shown in Figure I.9, we will likely want to include the number of launderings as part of the attribute (i.e. "water repellency after 10 launderings"), but we should ensure that this will meet the end user needs.

Once the issues with requirement extraction are adequately addressed, we will return to the development and implementation of table classification using a machine learning approach. If successful, this will make large-scale semantic extraction of tabular requirements more feasible.

Table I - 1: List of Purchase Description tables and materials covered by extraction

Purchase Description	*Table*	*Material*
CRFD-PD-04-08E	TABLE I	basic fabric
CRFD-PD-04-08E	TABLE II	lining fabric
CRFD-PD-04-10E	TABLE I	basic fabric
CRFD-PD-04-10E	TABLE II	lining fabric
FQSE-PD-08-05A	TABLE I	exterior material
FQSE-PD-08-05A	TABLE II	lining material
FQSE-PD-08-06A	TABLE I	exterior material
FQSE-PD-08-06A	TABLE II	lining material
GL-PD-13-04A	TABLE I	basic material
GL-PD-13-04A	TABLE II	lining
GL-PD-13-05A	TABLE I	basic material
GL-PD-13-07A	TABLE I	body and sleeve material
GL-PD-13-07A	TABLE I	neckband and cuff material
GL-PD-13-09A	TABLE I	basic material
GL/PD 13-04B	TABLE I	basic material

GL/PD 13-04B	TABLE II	lining
GL/PD 13-06D	TABLE I	basic cloth
GL/PD 13-06D	TABLE II	liner, id and key pocket cloth
GL/PD 13-08B	TABLE I	basic material
GL/PD 13-08B	TABLE II	lining
GL/PD 13-09	TABLE I	basic material
NCTRF-PD-16-15A	TABLE I	body and sleeves
NCTRF-PD-16-15A	TABLE I	neckband/cuffs
NCTRF-PD-17-15A	TABLE I	shell cloth
NCTRF-PD-17-15A	TABLE II	liner, id/key pocket cloth

Appendix J: Task 2.1 Milestone Report - 18-Jun-2019 - Report on the use of extracted requirements in a standardization study

This report summarizes the application of extracted requirements data to the study of standardization between similar items. Specifically, attributes from purchase descriptions for three jackets and two shirts were compared. A fair amount of variability in characteristics was found.

Milestone Report – Task 2.1

XSB, Inc.
June 18, 2019

Contract Number: SP4701-14-D-7006
Delivery Order: SP4701-18-F-0045

Report on the use of extracted requirements in a standardization study

Our program to extract structured requirements for physical training uniforms has provided the opportunity to study the degree of standardization in technical data for similar items purchased by different service branches. The examples discussed below could in principle be carried out "by hand" but having the data in the form of structured requirements allows the rapid extraction and comparison of the information.

In our analysis we looked into attributes associated with the basic cloth and liner cloth for the following Purchase Descriptions:

Document ID	Title	Basic (B) Liner (L)
CRFD-PD-04-08E	JACKET, IMPROVED, PHYSICAL TRAINING UNIFORM	B,L
CRFD-PD-04-10E	PANTS, IMPROVED, PHYSICAL TRAINING UNIFORM	B,L
FQSE-PD-08-06A	Marine Corps Running Suit - Pants	B,L
GL/PD 13-04B	JACKET, UNISEX, ARMY PHYSICAL FITNESS UNIFORM	B,L
GL/PD 13-05A	PANTS, FEMALE, ARMY, PHYSICAL FITNESS UNIFORM	B
GL/PD 13-06D	TRUNKS, ARMY PHYSICAL FITNESS UNIFORM	B,L
GL/PD 13-07A	T-SHIRT, ARMY PHYSICAL FITNESS UNIFORM	B
GL/PD 13-08B	JACKET, FEMALE, ARMY PHYSICAL FITNESS UNIFORM	B,L
GL/PD 13-09A	PANTS, UNISEX, ARMY, PHYSICAL FITNESS UNIFORM	B
NCTRF-PD-16-15A	UNDERSHIRT, PHYSICAL FITNESS UNIFORM, MOISTURE WICKING	B
NCTRF-PD-17-15A	TRUNKS, PHYSICAL FITNESS UNIFORM	B,L

Starting with basic fabric, we looked into attributes defined across the set of documents. Altogether, we found 61 different attributes defined for the 11 items. For a meaningful standardization comparison, it makes sense to compare attributes from purchase

descriptions for similar items. For the purposes of this report, we will focus on results for jackets and shirts.

Basic material for jackets have the following attributes associated with them.

Attribute	CRFD-PD-04-08E	GL/PD 13-04B	GL/PD 13-08B
breaking strength, filling (lbs min)	85	150	150
breaking strength, warp (lbs min)	80	190	190
colorfastness to crocking, dry (min)	4.0	-	-
colorfastness to crocking, wet (min)	3.5	-	-
colorfastness to laundering, 3 cycles, staining	-	4	4
colorfastness to laundering, after 3 cycles	-	4	4
colorfastness to laundering, shade change	4	-	-
colorfastness to laundering, staining, nylon	3.5	-	-
colorfastness to light, 40 hours or 170 kj	-	3	3
colorfastness to perspiration, acid	4	-	-
colorfastness to perspiration, alkaline	4	-	-
dimensional stability, after 5 launderings, filling	2.5	-	-
dimensional stability, after 5 launderings, warp	2.5	-	-
dimensional stability, filling	-	4	4
dimensional stability, warp	-	4	4
fabric yarn count, filling	95	66	66
fabric yarn count, warp	120	157	157
fiber content	100% polyester	-	-
moisture vapor transmission rate, inverted (min)	8000	-	-
moisture vapor transmission rate, upright (min)	850	-	-
oil repellency-hydrocarbon resistance, after 10 launderings	A	5	5
oil repellency-hydrocarbon resistance, after 100 launderings	-	4	4
oil repellency-hydrocarbon resistance, initial	A	5	5
tear strength, fill (lbs)	2	-	-
tear strength, warp (lbs)	1.5	-	-
water repellency, spray test, after 10 launderings	100	100	100
water repellency, spray test, after 100 launderings	-	50	50
water repellency, spray test, initial	100	100	100

Attribute	CRFD-PD-04-08E	GL/PD 13-04B	GL/PD 13-08B
Weight (oz./sq. yd.)	2.2±0.3	3.5±0.3	3.5±0.3

There are a few things of interest to note. As expected, the basic cloth for GL/PD 13-04B and GL/PD 13-08B have identical properties. In this case, the basic cloth is nylon, while for CRFD-PD-04-08E the material is polyester. Beyond that, it is evident that somewhat different tests are applied to the two types of cloth. Whether or not this is due to the different types of cloth is beyond the scope of this analysis. For both types of cloth, AATCC 118 is identified as the test standard for initial oil repellency. That standard defines a numerical grade for the results, so it is not clear what "A" means for the CRFD-PD-04-08E material.

Next, we look at the basic material described in the two purchase descriptions for shirts, GL/PD 13-07A and NCTRF-PD-16-15A. In both of these documents, the basic cloth is described as "100 percent low-pill, spun polyester performance knitted fabric on a circular knit machine with a jersey stitch."

Attribute	GL/PD 13-07A	NCTRF-PD-16-15A
air permeability	-	150
anti-microbial, migratory, after 25 launderings	-	Log 3 or better/99.9 % min
anti-microbial, non-migratory, after 25 launderings	-	Log 2 or better/99.0 % min
anti-microbial, migratory, initial	-	Log 3 or better/99.9 % min
anti-microbial, non-migratory, initial	-	Log 2 or better/99.0 % min
bursting strength (lbs)	120	120
colorfastness to crocking	2.5	4
colorfastness to laundering, after 5 cycles	3	4
colorfastness to light, 40 hours or 170 kj	3	4
colorfastness to perspiration	2-3	4
dimensional stability, after 5 launderings, courses	4.0	-
dimensional stability, after 5 launderings, wales	4.0	-
dimensional stability, courses	-	4.0

dimensional stability, wales	-	4.0
drying time (minutes)	40	-
fabric yarn count, courses	47	44
fabric yarn count, wales	34	35
opacity, dry	-	83
opacity, wet	-	73
ph	-	5.5 to 8.5
physical surface, change after laundering, after 25 launderings	-	4 or better
seam smoothness, after 5 launderings	-	SS-3 or better
seam smoothness, initial	-	SS-3 or better
vertical wicking (30 minutes)	-	6 inches
weight (oz. / sq. yd.)	5.3±0.2	6.2±0.2
wicking, filling (15 minutes)	6 inches	-
wicking, warp (15 minutes)	6 inches	-

Interestingly, even though the items are similar and use similar cloth, there is a fair amount if variance in the attributes tested and the expected values. One possible reason could be that we are focused on requirements described in tables, and some might be given in non-table narrative text in one of the documents. However, no evidence was found for that in this case.

All in all, it was found that extracted requirements stored in the MUST KB can be used to rapidly characterize the differences and similarities in technical requirements from different items. For this to work well it is important that the attribute text is normalized across the different documents, so that a reasonable comparison can be made. This is something that has been done in the course of this work, but it will be an ongoing concern as more item types are added.

In terms of the larger standardization picture, it is clear from this analysis that similar items may not always be defined by the same tests and attributes, and that this may need to be addressed in order to share items across services.

Appendix K: Task 2.1 Milestone Report - 18-Aug-2019 - Report on the Semantic Analysis Research

This report summarizes the work done on extracting structured semantic requirements information from narrative and tabular text. Some of this extracted information was passed, via API, the TexBase test reporting tool.

Milestone Report – Task 2.1

XSB, Inc.
August 18, 2019

Contract Number: SP4701-14-D-7006
Delivery Order: SP4701-18-F-0045

Report on the Semantic Analysis Research

The focus of this task has been to extend work on automatically extracting structured information from textual and tabular document data. Having structured information in this form can aid in the management and use of technical data. There are a number of ways this information could be used, including:

- It can decrease time-to-knowledge for users needing to find specific requirements and test methods.
- It can be used to quantify and promote standardization across services and items.
- It can be used to check for consistency of requirements for a single item.
- It can be used to help automatically populate testing reports with appropriate tests and values.

It is this last application that has been the focus of the current task. In particular, we are extracting requirements for a limited class of items and making that data available in a way that is useful to the LMI/TexBase test report tool.

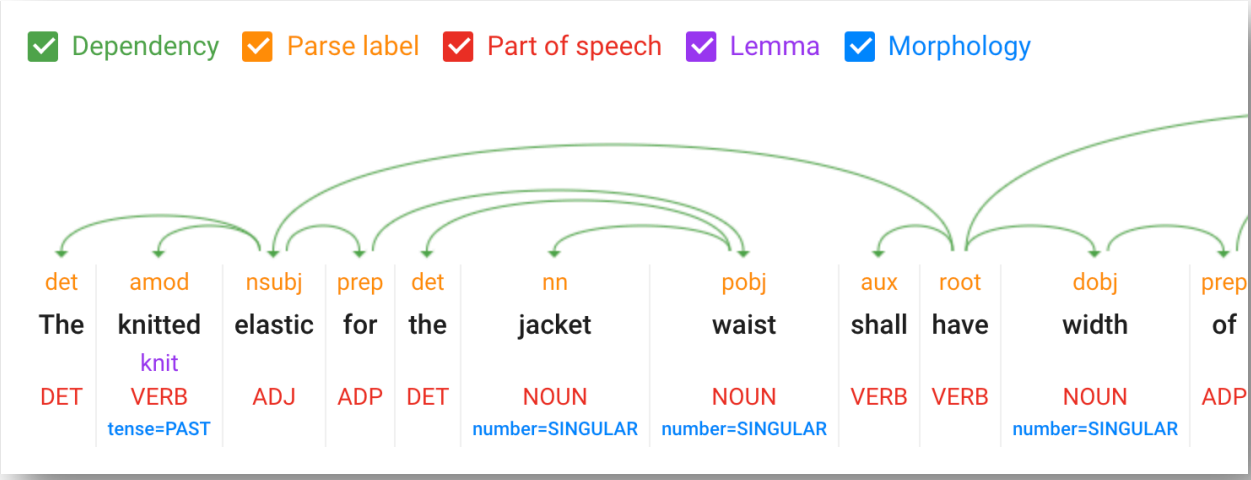
Our approach has been to model individual requirements as having a subject, an attribute, and a value. In addition, each requirement should be associated with verification method. Taken together, the set of modeled requirements should contain a complete picture of the characteristics of the item or process being described by the specification.

In general, there are two ways in which requirements can be expressed in a specification document. First, they can be in "narrative form" in the document text. Each individual requirement will generally be expressed in a sentence that contains the word "shall", as in "All joining seams shall be topstitched for strength." Second, requirements may be expressed in tabular form, typically in a table with column headers "characteristic" and "requirement". Quite often, requirements that have numerical values are arranged in tabular formats. Both of these forms were researched as a part of this effort. From a practical standpoint, it became clear early on that the information needed for the test report tool would come from tabular requirements, so the majority of the effort ended up directed towards this format.

Regardless of the original format of the requirement, it is necessary to have a common vocabulary for expressing the subjects and attributes described, in order to eliminate ambiguity. There are a number of options for creating and curating vocabularies; this will be discussed in a later section.

Narrative Requirements

Research into the narrative requirements was carried out in collaboration with an outside expert, in order to gain some insight into current technologies. The primary technology of interest here is Natural Language Processing (NLP), which is used to model terms and the relationships between terms in requirements sentences. This information can then, in principle, be used to construct the structured requirement model. Parsing a sentence with NLP returns information on the grouping of words into phrases within a sentence and the relationships between the words and phrases. The figure below shows, in graphic form, part of the NLP results for the sentence "The knitted elastic for the jacket waist shall have width of 1 1/2 inches."



The direct subject for the verb phrase "shall have" is identified as "elastic", which is in turn further clarified by "the knitted" and "for the jacket waist". This allows us to clearly identify the subject of the requirement. Several software packages and services are available for parsing sentences, including StanfordNLP (software library), and Google Natural Language API (cloud-based). We examined several and found them to be more or less equivalent for our purposes.

The language used in specification documents is somewhat constrained, in that requirement sentences use a limited set of structures. This makes the interpretation somewhat easier than it would be for other types of documents. There are, however, still a number of complicating factors in mapping the results to a requirements model. One of the more difficult ones is the referential connections between sentences. For example, in the pair of requirements sentences

> The knitted elastic for the jacket waist shall have width of 1 1/2 inches. Its warps shall be 22 ends 1/50 semi-dull polyester and the total warp ends shall be 22.

The word "Its" at the beginning of the second section refers to the subject of the previous sentence (knitted elastic for jacket waist). In order to correctly model requirements in the second sentence, it is necessary to recognize this relationship. Carrying out this type if analysis is known as "coreference resolution", and there are a number of approaches that can be taken. One promising one that we looked at was Discourse Representation Theory, which is used to build up a representation of the material being studied. In the case of specification documents, we could include, for example, paragraph titles to provide context for following requirement sentences.

In analyzing requirements sentences it is also important to take into account conditional phrases such as "unless otherwise specified":

> Bartacks shall be 3/8 inch unless otherwise specified.

For consumers of the requirements data, this is of course a crucial piece of information. This type of information can best be handled by expanding our initial, simple requirements model to include the conditional information.

As mentioned earlier, it became clear that the information needed for the test reporting tool was found almost entirely in table form in the documents of interest. For that reason, the investigations discussed here for narrative text were not implemented in the current task. However, they should provide a good basis for moving forward with narrative requirement extraction in future work.

Requirements from Tables

Quite often, item and component requirements are expressed in tabular form. Recognizing and extracting this information in a scalable, automated way depends to some extent on the consistency with which the information is presented from document to document. It was found that for the physical requirements tables were quite consistent, with these tables having column headings "characteristics" and "requirements", where the first column gives the attribute, and the second provides the value. In about one quarter of the cases, the relevant test methods are given in the same table as the requirements, while in the rest the test methods are provided in a separate table, where the columns are labeled "characteristic" and "test method".

There is somewhat less consistency in how the information within a table is arranged. Attributes can be split over a number of table rows, and measurement units may appear with the numeric value, or be given as part of the attribute. In the figure below, the requirement "the basic fabric shall have a warp breaking strength of at least 80 pounds" is expressed in tabular form. Note that the attribute is broken over two lines, which needs to be taken into account. In the example shown, the "filling breaking strength" is split over non-contiguous lines. A number of table properties were taken into account in order to

properly connect compound attributes such as these. The most reliable property for this purpose is the indentation of lines following the initial part of the attribute. The presence or absence of borders between cells can also be relevant and was taken into account. These factors are examples of instances where document layout can be a meaningful part of the semantics of the specification, and so needs to be accounted for when a document is expressed as a digital model.

It should also be noted that the attribute text in the example contains both the units (lbs) and the fact that the value is a minimum. In order to make our requirements model useful to the test report tool, we want to model this information as separate parts of the requirement. That means instead of having "value" associated with a requirement, we may have "minimum value", "nominal value", "maximum value", and "units". This approach was worked out in collaboration with MUST partners.

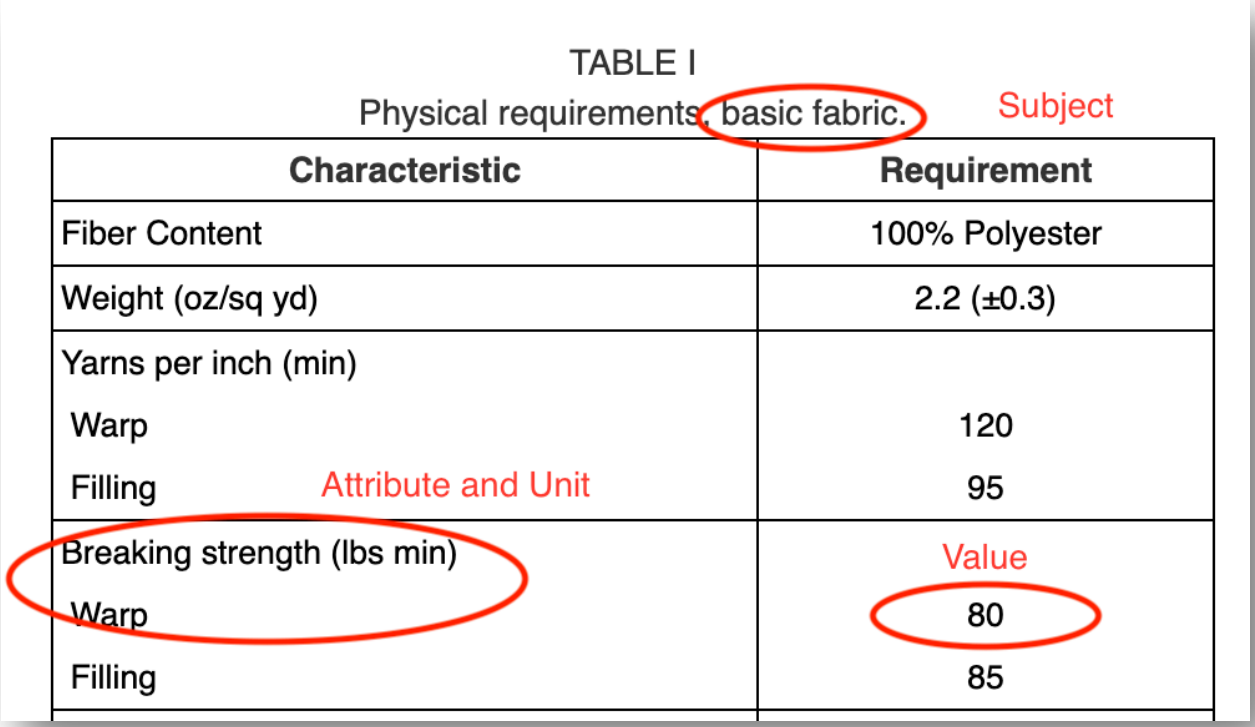


TABLE I

Physical requirements, basic fabric.

Subject

Characteristic	Requirement
Fiber Content	100% Polyester
Weight (oz/sq yd)	2.2 (±0.3)
Yarns per inch (min)	
Warp	120
Filling	95
Breaking strength (lbs min)	
Warp	80
Filling	85

Attribute and Unit

Value

In the case of the "weight" attribute shown in the figure above, where a range of acceptable values is indicated, we extract minimum, nominal, and maximum values of 1.9, 2.2, and 2.5 respectively.

Standardized Vocabularies

For both narrative and tabular information, the structured requirements are extracted and stored in the knowledge base. The text used to describe subjects and attributes may not be

an exact match from one document to another and may even be inconsistent within a single document. This is not generally an issue for readers of the document, who are knowledgeable about the subject matter and naturally understand the equivalence of terms described in slightly different ways. In order for the modeled data to be useful, it is necessary that terms be expressed as in a common way, generally by assigning a persistent identifier and defining a standardized label. Under the present task, we developed a hand-curated vocabulary that included variations on the way each term was expressed. This allowed us, as information was extracted, to associate each extracted term with a persistent identifier, so that requirements can be compared within and between documents.

There are a number of ways to express a standardized vocabulary within the knowledge base. We chose to use the widely-accepted Simple Knowledge Organization System (SKOS), which allows the assignment of preferred and alternate labels to terms and has ways of expressing the relationships between terms. This system also allows terms to be grouped in "concept schemes", so that the vocabulary to be used can be context dependent. Data structures for mapping concepts between schemes is available. In order to share data with the TexBase application, we added a specialized concept scheme using their vocabulary. When data is requested from the knowledge base, the TexBase ID for the attributes are included.

Next Steps

The initial work in requirement extraction has been promising. An important aspect of future work will be to make sure that the techniques investigated here can be scaled up to cover a larger number of documents in a wider range of domains. The primary impediment to this is the manual curation of a standardized vocabulary. There is a large body of knowledge and ongoing research in the field of automated terminology extraction. We would propose applying these techniques to specification documents, which to our knowledge has not been done before.

Most of the terminology extraction techniques make use of the sentence parsing described earlier in this report, in order to identify key phrases. The Discourse Representation Theory discussed above would also be relevant to terminology extraction. While working on the narrative text with the parser, we should also expand and improve extraction of more detailed information about individual requirements, including coreference resolution and conditional phrasing.

Appendix L: Task 2.2 Milestone Report - 18-Jun-2018 - Initial Functional Requirements for Integration with PTC Material Exchange

Discussions between PTC, Inc and XSB Inc resulted in in understanding of what was needed to integrate TexSpecs with the newly created industry database MLXC.

Initial Functional Requirements for Integration with PTC Material Exchange

Contract SP4701-14-D-7006, Delivery Order SP4701-18-F-0045
Task 2.2
Milestone: "Initial functional requirements for integration of MUST and MLCX"

XSB, Inc.
June 18, 2018

Inconsistent product requirements data is a problem to the military and commercial enterprises in the textile space. The product lifecycle management company PTC Inc. is working with the Clothing and Textile industry to develop the Materials Library and Collaborative Exchange (MCLX). The exchange currently focuses on footwear materials but plans to span the entire fashion sector.

Background

By integrating data from the MUST/TexSpecs Knowledge Base and MCLX, future users, including the DLA Product Testing Center, will be able to compare fabric attributes offered by commercial suppliers with the requirements defined in purchase descriptions, specifications, and commercial item descriptions.

Data Exchange

The MCLX will use the GS1 Standard for describing material properties, which is similar to the attribute sets used in government purchase descriptions. It is built on PTC's FlexPLM software, and uses the ThingWorx Retail Connector (TRC) to communicate between the exchange and other data sources. Under the current delivery order task 2.1, XSB is extracting and storing structured data on the attributes of fabrics used in Physical Training uniforms, and making it available via an application programming interface (API).

Under this task, we will integrate the MUST/TexSpecs knowledge base and MCLX by extending our API to communicate with the TRC:

- The API will allow the TRC to query for the existence available material data.
- The API will allow the TRC to request material data extracted from purchase descriptions. This will be transmitted in a format compatible with the GS1 standard, and will include a link to the source document. The TRC will respond with a "material object ID" that will be used to associate the material data stored in the two systems.

- The API will include functionality to query the MCLX, using material attributes as query parameters, to find materials that manufactures have added. This can then be used, in principle to find commercial materials that match requirements defined in purchase descriptions and other documents.

Next Steps

An initial analysis has indicated that a reasonable mapping between the attributes defined by GS1 and those found in purchase descriptions. We will formalize this mapping and add the functionality to retrieve mapped data to the API. We are in the process of establishing a local version of the FlexPLM software in order to carry out development.

Appendix M: Task 3 Milestone Report - 18-Jun-2019 - Report on user group findings and resulting improvements

This report summarizes the feedback we received from a series of stakeholder meetings, and the resulting improvements to the application that arose from that feedback.

Milestone Report – Task 3

XSB, Inc.
June 18, 2019

Contract Number: SP4701-14-D-7006
Delivery Order: SP4701-18-F-0045

Report on user group findings and resulting improvements

Over the previous eighteen months, personnel from XSB have met extensively with stakeholders from C&T in Philadelphia to engage users in using the TexSpecs tool in order to gather feedback on its various features, assess ease of use, and make improvements to the system in response.

Upon demonstration of various features and functions of the TexSpecs tool, we did receive valuable feedback and modified the application in response. The feedback fell into five broad categories: Navigation, Document View, MS Word Export, Analysis Features, and Change Management.

In addition, the issue of site performance was discussed, and so we worked to improve that as a part of every software update.

Navigation

Document tree

The "tree view" of documents in the knowledge base is a key entry point into the system. At the start of this project, only document ID's were shown in the tree. At the request of C&T stakeholders, we added document titles to this view, in order to help find the right document. We expanded the number of sub-branches under the "GOV" branch to make it easier to find the desired document. In addition to this we added a branch to the tree to contain all MUST-related government documents, in order to make these easier to find.

Search

In the results of a document search, the month and year that a document was published were shown in the format YYYYMM (i.e. 200606 for June 2006). Stakeholders indicated that this was not ideal, and we changed the format to the more common and more readable "MMM YYYY", (Jun 2006, Aug 1997, etc.).

Document View

Understandably, the appearance of the document is important to stakeholders. Several improvements were made to document display based on discussions with users.

Element Alignment

Based on user feedback, we added the ability to more precisely control the placement and size of document elements such as tables, in order to more closely match the print version of the document.

Images

We improved the resolution of images being stored in the knowledge base and added the ability to view a high-resolution version of the image by clicking on it in the document.

Expanded Status Information

If a document exists in the ASSIST database, then we provide a "status chip" at the top of the document view. This allows users to see at a glance if a document is cancelled, superseded, etc. Clicking on the chip shows information about all of the document revisions we have information for. At the request of users, we also added a link to the ASSIST web site page for the specification.

Interim Change Notification

At the beginning of the project, in order to see if there were interim changes for a document, the user had to look under the "Action" menu at the top of the screen. Under this effort, we created a "Change" chip to appear at the top of the document. Clicking on this chip allows the user to select and apply a set of changes to the document.

Front-matter display

In early versions of the application, we prefaced the measurement system information with the text "Measurement System:". At user request, this was removed. In addition, we modified date displays to more closely match formats requested by users.

Export to MS Word

The ability to export a document to MS Word is seen as a valuable feature by stakeholders.

Formatting

The extra element alignment data mentioned above allowed us to more closely match the printed version when transforming the digital document model to MS Word. In addition to this, we took a stakeholder-supplied template for MIL-STD-961 conformant documents and made sure that we matched the required fonts and margins as a part of the transformation.

Watermarks

Part of our work involved creating a "Word round-trip". This means that users can download a document, make changes, and upload it as a draft for a new revision. In the

document view, drafts have a "draft" watermark showing on the screen. At user request, we made sure this watermark was added to any Word export of the draft.

Analysis Features

A key advantage to storing documents as digital models is the ability to carry out automated analyses of the information stored in the knowledge base. Two features of interest to the stakeholder group were checks of MIL-STD-961 format requirements, and the ability to easily find the status of referenced documents.

MIL-STD-961 Format Report

Initially, we called this a "Compliance Report", but the stakeholders preferred "Format Report". It was noted by stakeholders that the requirement for the Applicable Documents section was that referenced documents should appear in section 3 or 4, and the logic of the analysis was changed to reflect that. We improved the appearance of the report to highlight document references that were found to be problematic.

As a convenience, we added the ability to export the format report as a PDF document.

Originally, we allowed the report to be run for any government document. At the suggestion of DSPO, we scaled this back to only include MIL-DTL- and MIL-PRF- documents, plus Purchase Descriptions. Subsequently, stakeholders at C&T requested the addition of all documents with IDs in the form MIL-X-, where "X" is any letter.

Reference analysis

The "references from" feature in the application allows users to see what documents are being referenced either directly ("one-hop") or indirectly ("two-hops") by the document being viewed. This is a useful tool for meeting requirements for document review and update. Based on user feedback, we changed the display of this information in a number of ways. First, we provided a status chip with each result, and allow the user to click on the status chip to see all available versions of the referenced specification.

We modified the results view to eliminate the "directly referenced by" column from one-hop results and made the choice of one-hop or two-hop into a more intuitive control ("radio buttons" vs "drop-down").

Change Management

Interim changes were a common area of interest and topic of discussion with the stakeholders. Part of the discussion was how to enter the information in a way that would make automatic insertion of the changes a possibility (that is, actually carry out "delete and substitute" where specified by the change text). Because there is no standardized way of expressing changes, this is next to impossible to do with the change data "as is". In collaboration with C&T stakeholders, we developed an MS Word format that would allow these kinds of instructions to be recognized. We also modified the knowledge base to accommodate this information and developed the functionality to on-board these change documents.

The intent was that the new format might be used for authoring changes in the future. Generating changes in this format by starting from the current legacy changes was found to be somewhat time-consuming and might not be amenable to a large-scale effort.

Summary

Our interaction with C&T stakeholders provided useful insight on how the application might be used in their day-to-day work, and what kind of functionality was needed to make it useful to them. We hope to continue the collaboration in future phases of this project.

Appendix N: List of Documents added under Task 6

Table M - 1: Documents added under task 6

Document	Title	pages	onboarded
A-A-50003D	COMMERCIAL ITEM DESCRIPTION DRAWERS, MEN'S (BRIEF TYPE)	7	7/6/18
A-A-50015C	COMMERCIAL ITEM DESCRIPTION SOCKS, STRETCH TYPE (DRESS OR LINER)	5	7/6/18
A-A-50526C	COMMERCIAL ITEM DESCRIPTION HAT, SERVICE: WITH CHIN STRAP	4	7/6/18
A-A-55060	COMMERCIAL ITEM DESCRIPTION GLOVES, MEN'S AND WOMEN'S HEAVY DUTY	10	7/6/18
A-A-55068	COMMERCIAL ITEM DESCRIPTION JERSEY, FLIGHT DECK CREWMAN'S	8	7/6/18
A-A-55074	COMMERCIAL ITEM DESCRIPTION MAT, SLEEPING, SELF-INFLATING	4	7/6/18
A-A-55077A	COMMERCIAL ITEM DESCRIPTION BAG, DUFFEL	12	7/6/18
A-A-55105	COMMERCIAL ITEM DESCRIPTION BAG, BARRACKS	8	7/6/18
A-A-55111A	COMMERCIAL ITEM DESCRIPTION COAT, ALL-WEATHER, WOMAN'S, w/REMOVABLE LINER	19	7/6/18
A-A-55178	COMMERCIAL ITEM DESCRIPTION COVERALI'S, MEN'S, COTTON, SATEEN	8	7/6/18
A-A-55196A	COMMERCIAL ITEM DESCRIPTION COVERALLS, DISPOSABLE	7	7/6/18
A-A-55199	COMMERCIAL ITEM DESCRIPTION NECKTIE	11	7/6/18
A-A-55236	COMMERCIAL ITEM DESCRIPTION GLOVES, MEN'S, CLOTH, DRESS, WHITE	8	7/6/18
A-A-55239A	COMMERCIAL ITEM DESCRIPTION SWEATER, SERVICE, WOOL	8	7/6/18
A-A-55316	COMMERCIAL ITEM DESCRIPTION COVERALLS, UTILITY	6	7/6/18
A-A-59490	COMMERCIAL ITEM DESCRIPTION TRUNK LOCKERS	5	7/6/18
A-A-59531	COMMERCIAL ITEM DESCRIPTION SLACKS, MATERNITY	7	7/6/18
A-A-886A	COMMERCIAL ITEM DESCRIPTION TOWELS, BATH, (TERRY)	11	7/6/18
A-A-896C	COMMERCIAL ITEM DESCRIPTION PAPER SET, MANIFOLD AND CARBON (CORRESPONDENCE SET)	4	7/6/18
MIL-B-20269E	MILITARY SPECIFICATION BUCKLES: INSIGNIA AND PLAIN	15	7/6/18
MIL-C-24910B	MILITARY SPECIFICATION CLOTH, TROPICAL: POLYESTER AND WOOL	12	7/6/18
MIL-C-24945	MILITARY SPECIFICATION COVERALLS, FLAME RESISTANT (COTTON FRT)	37	7/6/18
MIL-DTL-18186E	DETAIL SPECIFICATION CROWNS, SERVICE AND DRESS CAP	22	7/6/18
MIL-DTL-20268H	DETAIL SPECIFICATION FRAME, CAP	30	7/6/18

Document	Title	pages	onboarded
MIL-DTL-32200	DETAIL SPECIFICATION COVER, ADVANCED COMBAT HELMET	15	7/6/18
MIL-DTL-3738L	DETAIL SPECIFICATION CLOTH, ELASTIQUE, WOOL	13	7/6/18
MIL-DTL-82288C	DETAILED SPECIFICATION TARPAULIN: LAMINATED, VINYL-NYLON OR VINYL-POLYESTER, FLEXIBLE	15	7/6/18
MIL-H-24936	MILITARY SPECIFICATION HOOD, ANTI-FLASH, FLAME RESISTANT	20	7/6/18
MIL-J-7823E	MILITARY SPECIFICATION JACKETS, FLYER'S, INTERMEDIATE, TYPE G-1	46	7/6/18
MIL-J-83382C	MILITARY SPECIFICATION JACKET, FLYER'S, MEN'S, SUMMER, FIRE RESISTANT,	38	7/6/18
MIL-J-83388E	MILITARY SPECIFICATION JACKET, FLYER'S, COLD WEATHER	54	7/6/18
MIL-J-87251	MILITARY SPECIFICATION JACKET, WOMAN'S: LIGHTWEIGHT WITH REMOVABLE LINER	45	7/6/18
MIL-K-41835D	MILITARY SPECIFICATION KIT BAG, FLYER'S	16	7/6/18
MIL-N-29367D	MILITARY SPECIFICATION NECK TAB, WOMEN'S SHIRT	21	7/6/18
MIL-S-24948A	MILITARY SPECIFICATION SLACKS, WOMEN'S (WITH SIDE POCKETS)	47	7/6/18
MIL-T-29452A	MILITARY SPECIFICATION TROUSERS, MEN'S: POLYESTER/WOOL	66	7/6/18
MIL-T-44243A	MILITARY SPECIFICATION TENT SECTIONS, TENT, EXTENDABLE, MODULAR, PERSONNEL (TEMPER)	29	7/6/18
GL/PD 13-09A	PURCHASE DESCRIPTION PANTS, UNISEX, ARMY, PHYSICAL FITNESS UNIFORM	20	6/29/18
GL/PD 13-07A	PURCHASE DESCRIPTION T-SHIRT, ARMY PHYSICAL FITNESS UNIFORM	20	6/29/18
GL/PD 13-04A	PURCHASE DESCRIPTION JACKET, UNISEX, ARMY PHYSICAL FITNESS UNIFORM	25	6/29/18
GL/PD 13-05A	PURCHASE DESCRIPTION PANTS, FEMALE, ARMY, PHYSICAL FITNESS UNIFORM	20	6/29/18
CRFD-PD 04-10E	PURCHASE DESCRIPTION PANTS, IMPROVED, PHYSICAL TRAINING UNIFORM	30	6/29/18
CRFD-PD 04-08E	PURCHASE DESCRIPTION JACKET, IMPROVED, PHYSICAL TRAINING UNIFORM	32	6/29/18
CRFD-02360	PURCHASE DESCRIPTION SWEATSHIRT,WITHOUT HOOD, MARINE CORPS	5	6/29/18
CRFD-02359A	PURCHASE DESCRIPTION SWEATPANTS, MARINE CORPS	2	6/29/18
NCTRF PD 16-15A	PURCHASE DESCRIPTION UNDERSHIRT, PHYSICAL FITNESS UNIFORM, MOISTURE WICKING	27	6/29/18
NCTRF PD 17-15A	PURCHASE DESCRIPTION TRUNKS, PHYSICAL FITNESS UNIFORM	25	6/29/18
CG/PD 15-22	PURCHASE DESCRIPTION SWEATPANTS, COAST GUARD	7	6/29/18
CG/PD 15-21	PURCHASE DESCRIPTION SWEATSHIRT, COAST GUARD	10	6/29/18
5100-91J	SHIRT, FLAME-RESISTANT ARAMID	27	10/4/18

Document	Title	pages	onboarded
5100-92M	PANTS, FLAME-RESISTANT ARAMID	38	10/4/18
AR-PD-10-02	HELMET, ADVANCED COMBAT (ACH)	94	10/12/18
AR-PD-11-06	PERSONAL ARMOR ENHANCED SIDE BALLISTIC INSERT (ESBI)	48	10/12/18
AR-PD-12-01-CHANGE-7	IMPROVED RETENTION SYSTEM	22	10/12/18
CG-PD-11-02B	COAT, MEN'S, ATHLETIC, SERVICE DRESS BLUE (SDB)	18	10/12/18
CG-PD-11-04A	SLACKS, WOMEN'S, SEARVICE DRESS BLUE (FLAT FRONT)	14	10/12/18
CG-PD-11-07B	TROUSERS, MEN'S, SERVICE DRESS BLUE	13	10/3/18
CG-PD-12-04A	TROUSERS, SERVICE, MEN'S, WASH AND WEAR	15	10/10/18
CO-PD-06-21C	COAT,COMBAT	21	10/3/18
CO-PD-06-22C	TROUSERS,COMBAT	23	10/3/18
CR-PD-01-09	Beret, Wool	11	10/10/18
CR-PD-03-08	COAT, ALL-WEATHER, MEN'S	22	10/12/18
CR-PD-03-09	COAT, ALL-WEATHER, WOMEN'S	22	10/12/18
CR-PD-05-05	TRUNKS, GENERAL PURPOSE	8	10/3/18
CRPD-13-16	BOOT, SAFETY, COMPOSITE TOE	17	4/18/19
FNS-PD-96-13	TUNIC, MATERNITY	9	10/12/18
FNS-PD-96-14	SHIRTS, WOMEN'S: MATERNITY, LONG AND SHORT SLEEVES	13	10/12/18
FNS-PD-96-20	Goggles, Sun, Wind and Dust: 1974	44	10/29/18
FNS/PD-98-03	Shirt, Women's, Dress, White (Short Sleeve)	17	10/12/18
FQ-PD-06-09A	CAP, UTILITY, CAMOUFLAGE PATTERN	13	10/2/18
GL-PD-06-01A	UNDERSHIRT, LIGHT WEIGHT COLD WEATHER (GEN III)	9	1/29/19
GL-PD-06-02A	SHIRT, MIDWEIGHT COLD WEATHER (GEN III)	13	1/29/19
GL-PD-06-03B	JACKET, FLEECE COLD WEATHER (GEN III)	19	1/29/19
GL-PD-06-07A	PARKA, EXTREME COLD WEATHER (GEN III)	37	1/29/19
GL-PD-06-14A	DRAWERS, LIGHT WEIGHT COLD WEATHER (GEN III)	10	1/29/19
GL-PD-06-15A	DRAWERS, MIDWEIGHT COLD WEATHER (GEN III)	12	1/29/19
GL-PD-06-16B	TROUSER, SOFT SHELL COLD WEATHER (GEN III)	36	1/29/19
GL-PD-07-03C	SKIRT, WOMEN'S, DRESS	19	9/30/18
GL-PD-07-04C	SLACKS, WOMEN'S, DRESS	20	10/12/18
GL-PD-07-07C	COAT, WOMAN'S, CLASSIC DESIGN, POLYESTER/WOOL, ARMY BLUE 450, FUSIBLE	72	10/12/18
GL-PD-07-08C	COATS, MEN'S; POLYESTER/WOOL, ARMY BLUE 450, FUSIBLE	84	10/12/18
GL-PD-09-02C	BOOTS, COMBAT, HOT WEATHER - FLAME RESISTANT	39	4/18/19
GL-PD-10-16B	IMPROVED COVERALLS, COMBAT VEHICLE CREWMEN'S	36	10/3/18
GL-PD-11-04	BAG,DUFFEL	22	1/29/19
GL-PD-11-10A	Pads, Knee and Elbow System	23	10/12/18
GL-PD-12-17D	JACKET, INTERMEDIATE WEATHER OUTER LAYER, FLAME RESISTANT	27	10/3/18

Document	Title	pages	onboarded
GL-PD-12-18E	TROUSERS, INTERMEDIATE WEATHER OUTER LAYER, FLAME RESISTANT	22	10/3/18
GL-PD-13-12E	TROUSERS, FOOD SERVICE UNIFORM, UNISEX	20	10/3/18
GL-PD-13-16A	BOOT, EXTREME COLD WEATHER, INSULATED	16	4/18/19
GL-PD-16-06	SHOE, ATHLETIC	13	4/18/19
MIL-PRF-MCCUU-E	UNIFORM, COMBAT/UTILITY, CAMOUFLAGE PATTERN; MARINE CORPS	77	10/3/18
NAWC-PD-4631-04-09A	LINER, FLYER'S, JACKET, MAN'S, FLEECE, CWU-100/P	29	10/3/18
NAWC-PD-4631-04-10A	LINER, FLYER'S JACKET, WOMAN'S, FLEECE, CWU-101/P	29	10/3/18
NAWC-PD-4631-04-22B	LINER, FLYER'S, VEST, WOMAN'S, FLEECE, CWU-103/P	27	10/3/18
NCTRF-CID-55095	COVERALLS, UTILITY	24	10/2/18
NCTRF-PD-03-07B	APRON, SHIRT, TROUSERS, COVERALLS, OTTO FUEL PROTECTIVE	26	10/3/18
NCTRF-PD-06-06B	BLOUSE, WOMAN'S, SERVICE, KHAKI	17	10/3/18
NCTRF-PD-06-15	HAT, SERVICE, (WHITE)	29	10/10/18
NCTRF-PD-09-06A	TROUSERS, MAN'S, SERVICE	20	10/10/18
NCTRF-PD-13-98A	SHOES, DRESS, OXFORD	6	4/18/19
NCTRF-PD-14610J	COVERALLS, EXPLOSIVE HANDLERS, FLAME RESISTANT	19	10/3/18
NCTRF-PD-24949	JUMPER, WOMAN'S, WHITE	48	10/12/18
NCTRF-PD-4-99C	JACKET, COLD WEATHER	16	10/3/18
NCTRF-PD-87037	JUMPER, MAN'S, WHITE	48	10/12/18
NCTRF PD-08-06A	SHIRT, MAN'S, SERVICE, KHAKI	21	10/12/18
PD-29611A	VEST, SURVIVAL, AIRCREWMEN'S, (AIRSAVE)	32	10/12/18
PD-WNUV-13-05	COAT, MEN'S, SERVICE DRESS	60	10/12/18
PD85-1B	Trousers, Men's, Service	44	10/10/18
PD 93-6 REV 2	SLACKS, WOMEN'S	27	10/12/18
GL/PD 11-07	SHIRT, WOMAN'S, TUCK-IN	26	10/12/18
FNS PD 96-18	Aircrew Integrated Helmet System	32	10/4/18
CR-PD 06-32	BOOTS, HOT WEATHER, MARINE CORPS	37	4/18/19
CR-PD 06-31	BOOT, TEMPERATE WEATHER, MARINE CORPS	39	4/18/19

Document	Title	pages	onboarded
GL-PD-12-11B	UNDERSHIRT, INSULATED, FLAME RESISTANT, MOISTURE-WICKING	14	2/6/19
GL-PD-12-12B	DRAWERS, INSULATED, FLAME RESISTANT, MOISTURE-WICKING	14	2/6/19
GL-PD-15-01B	CLOTH, KNIT, FLAME RESISTANT (FR) BLEND, MOISTURE-WICKING	11	2/6/19

Appendix O: Reference Documents

The attached documents are:

- *TexSpecs Reference*: Reference manual available on the web application. 40 pages.
- *Administration Console User Guide*: Manual available on administration console web application. 15 pages.
- *Word Formatting Best Practices*: Best practices for formatting MS Word documents for upload. 8 pages.
- *TEX-290 Training Notes*: Notes for training sessions provided to C&T in December 2019 and February 2020. 33 pages.

TEXSPECS

MUST Military Unique Sustainment Technology

TEXSPECS REFERENCE

December 2019 Release

User manual for TexSpecs, a user interface for the
Military Unique Sustainment Technology (MUST) Knowledge Base.

swiss-support@xsb.com

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Contents

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Introduction

TexSpecs is a user interface to the MUST Knowledge Base (MKB). It is designed for finding and viewing specifications from a variety of publishers, with active links between documents that reference each other. In addition to these functions, the MKB infrastructure allows users of TexSpecs to:

- Create derivative documents that maintain active links to source data
- Subscribe to receive email alerts when new versions of specified documents are available
- View interim changes for specific items in-line with document text
- Assess the impact that changes to a specification may have on other documents

The three view modes in TexSpecs are, “Document,” “Interim Change,” and “Collection Manager.” The “Document” mode can be used to search for and view existing documents, and it can be used to create new documents called *Compositions*. A Composition is a user-created document that includes parts of other documents via *incorporation by reference and* can also include custom text entered by the user.

Interim changes are temporary modifications to documents that have been specified for particular items or sections. In ‘Document’ mode, interim changes can be displayed alongside the document text. To search for interim changes, independent of a specific document, the user can use ‘Interim Change’ mode. The interim changes will be returned in the search whether or not that specification is currently in the library.

“Collections” are custom groups of resources, which can include specification documents, compositions, and interim changes. They allow the user to define a set of information for later reference.

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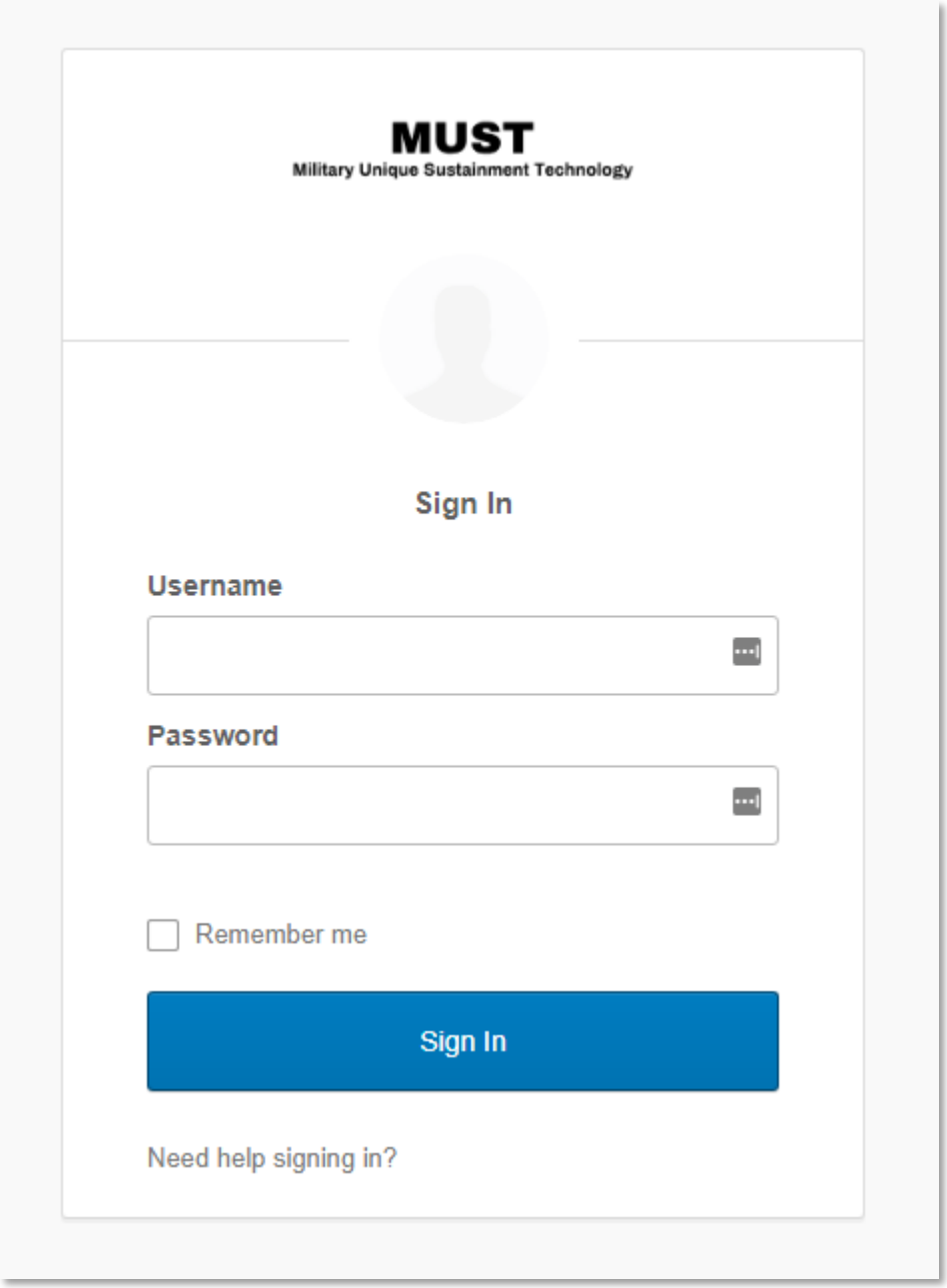
Logging In

The first screen will request a username and password. Fill-in these fields and select 'Sign In'



After logging in, you will be taken to the MUST Prototype page. Select the link for MUST TexSpecs Tool to navigate to TexSpecs.

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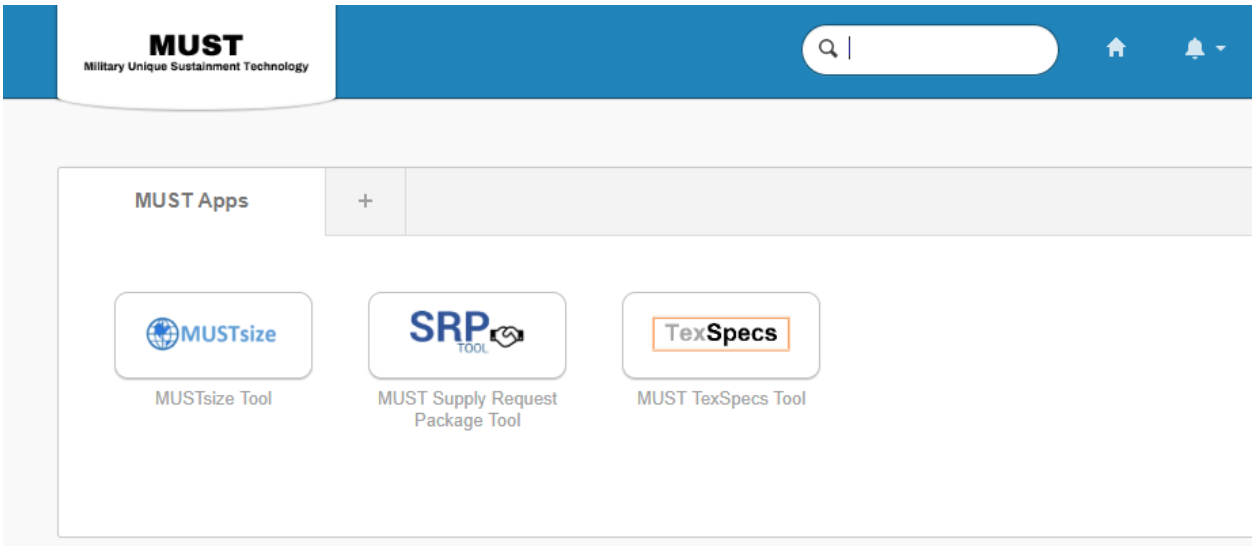
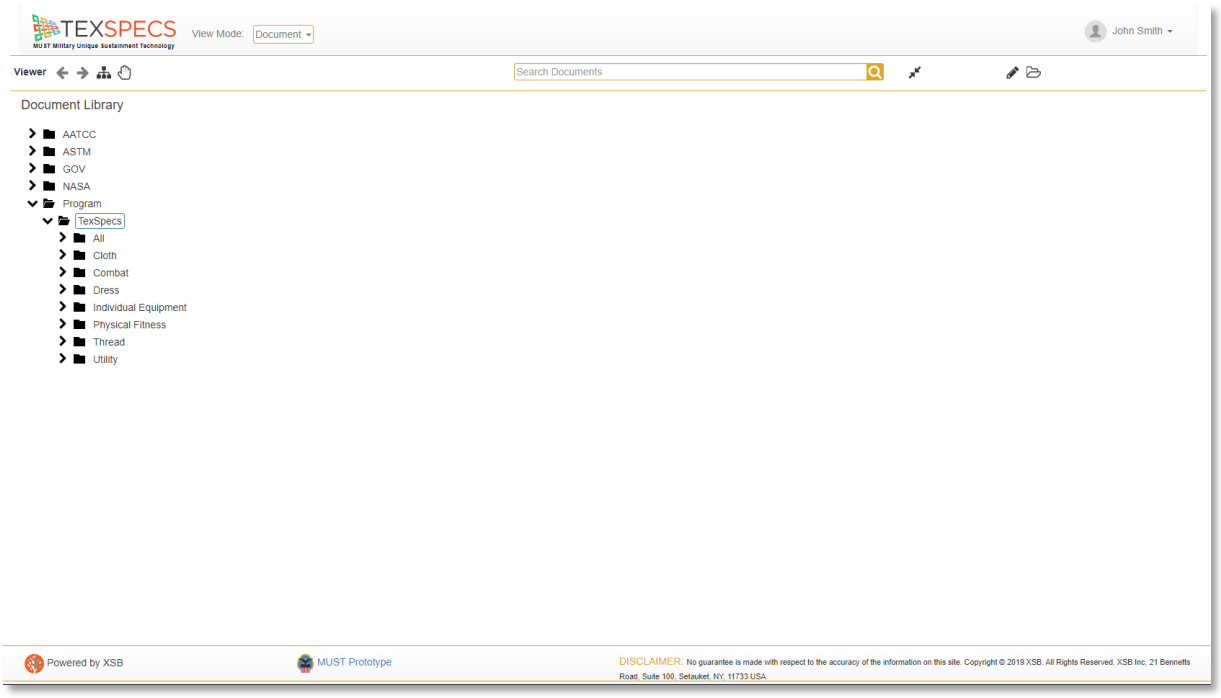


After navigating to Texspecs, a page will be displayed which contains a document tree. The tree lists documents in the system, grouped by publisher.



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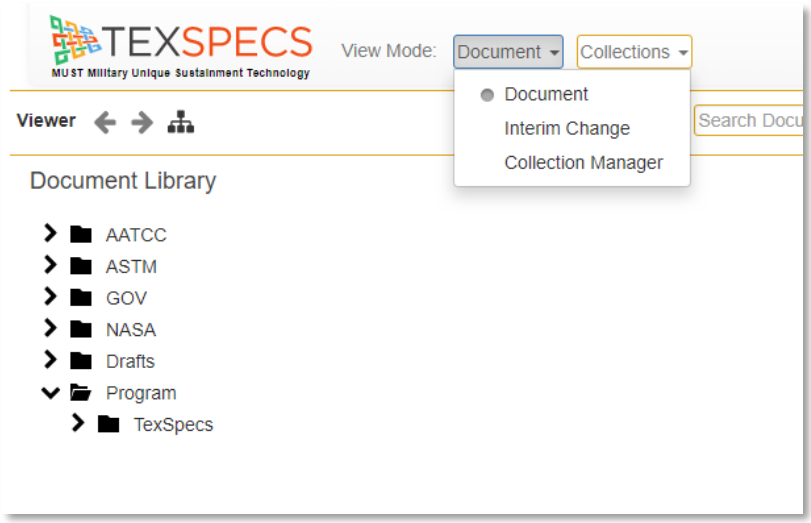
Modes

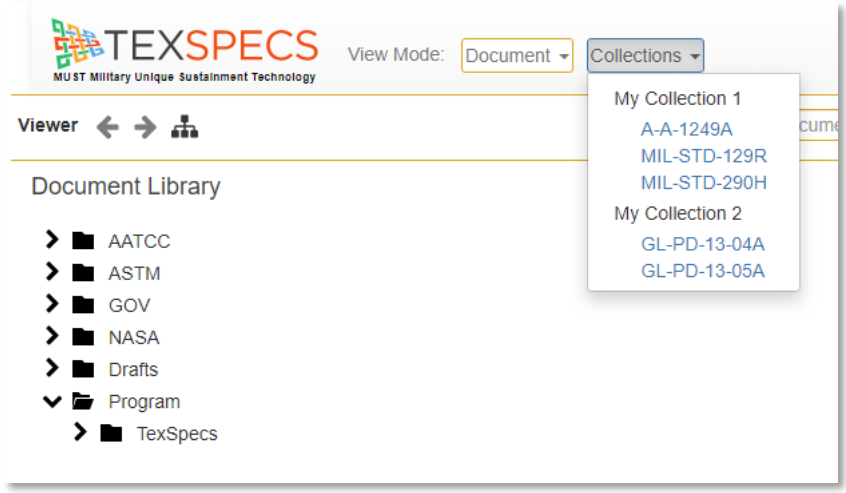
Once the application is loaded, the navigation bar will be displayed with the document mode controls below it. The three possible view modes are: Document, Interim Change, and Collection Manager. Details of each view mode are discussed later.

The 'View Mode' can be chosen using the drop-down menu at the top.



Collections

The Collection menu can be used to navigate to items in your collection. See View Mode Collection Manager for information on maintaining a collection. It is possible to add Specifications, Compositions, and Interim Changes to Collections, so they can be quickly navigated to.



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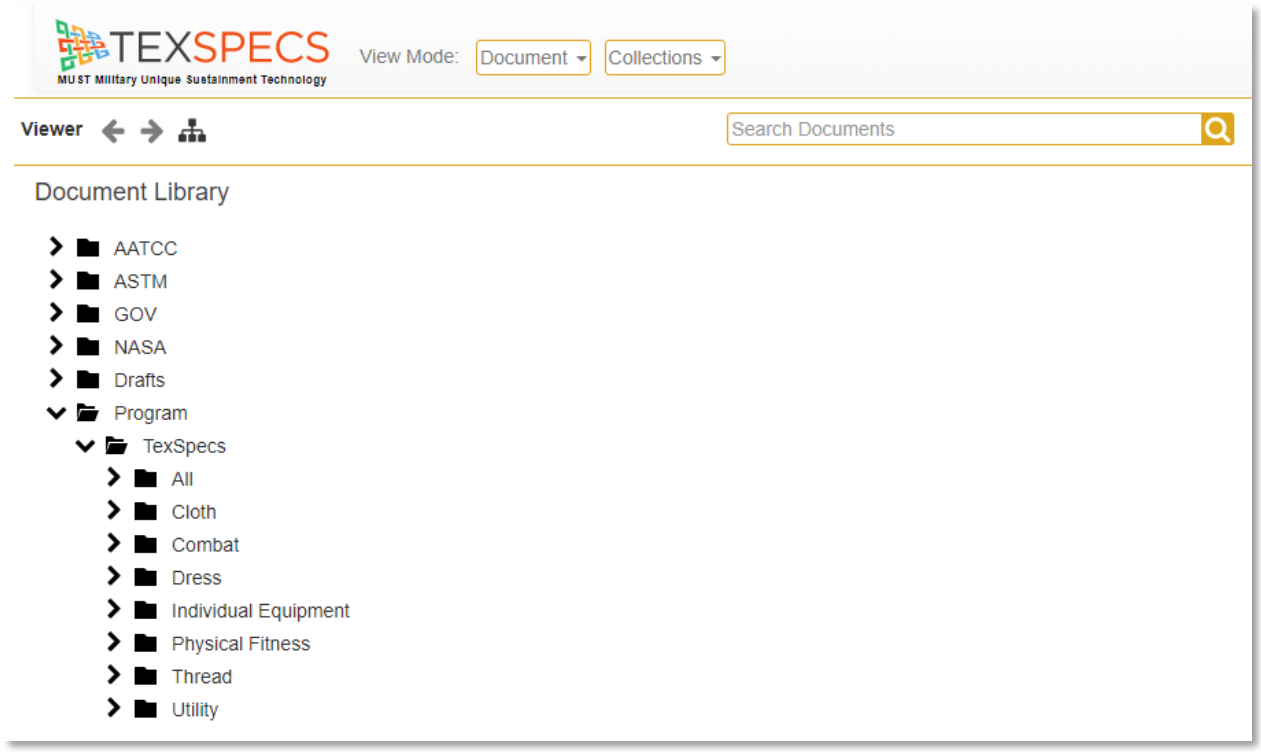
Document Tree



Organization

The tree may be used to navigate to a specific document. Click a document node to load the corresponding document in the viewer. Folders/leaves in the tree are specification development organizations (SDOs). In addition, some users will have a Program leaf in the tree. The Program leaf contains groups of documents organized for a special purpose. Users with permission to view draft documents will see a Drafts leaf in the tree.

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After a user has loaded a document for viewing, the Document Tree dialog can be reopened by clicking the “Document Tree” icon in the Viewer Controls.

Permissions/Roles

Users will only see specific folders in the tree if they have permission to view documents in that folder. Note that for users with permission to view draft documents, the document tree is the only way to navigate to them.

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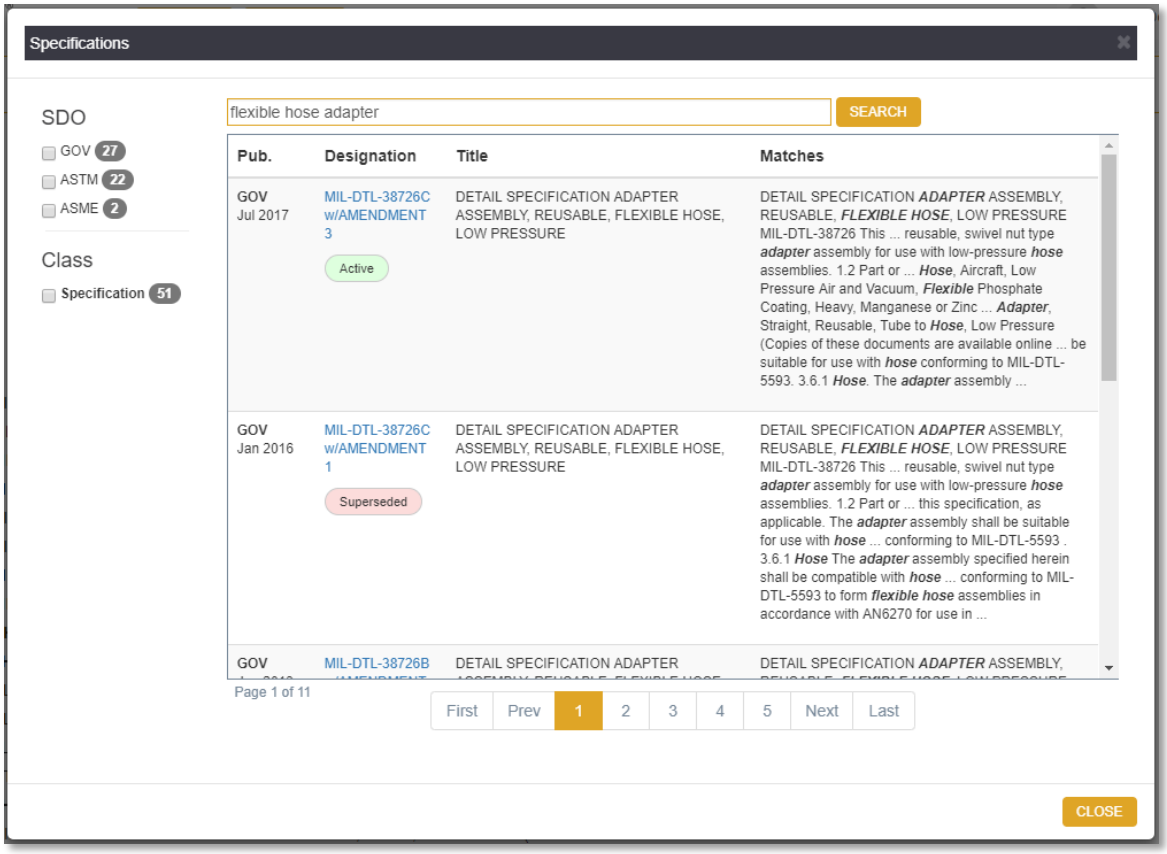
View Mode: Document

Search and Display

To find a document for display, enter the search terms into the search box and click the magnifying glass to the right of it. A keyword or search string (e.g. “flexible hose adapter”) or a document number (“MIL-PRF-44411”) can be used.

After clicking “Search”, a list of specifications matching that search string is listed. The search is carried out across document numbers, titles, and text. The search can be refined using the SDO and Class options on the left side of the search dialog.

Here is an example:



Selecting a specification from this list will close this window and the specification will be displayed.

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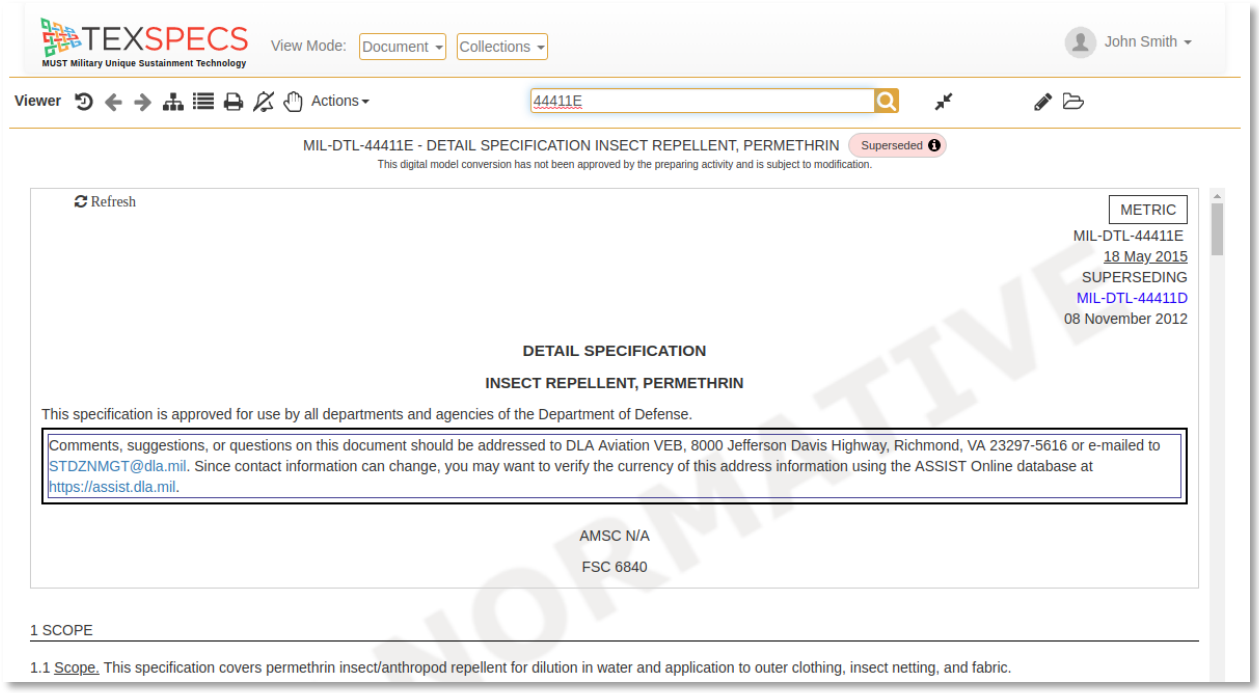
Here is an example of a specification displayed in the ‘Document’ mode:



This view mode has controls some of which change depending on the type of document displayed. For more information on the controls please see Viewer Controls. Displayed documents will contain links to internal document elements such as tables and sections, as well as links to other documents. For most links, hovering over the link with the mouse pointer will provide some information about the linked resource. For more information on document reference links please see the sections on Links and Semantic Links

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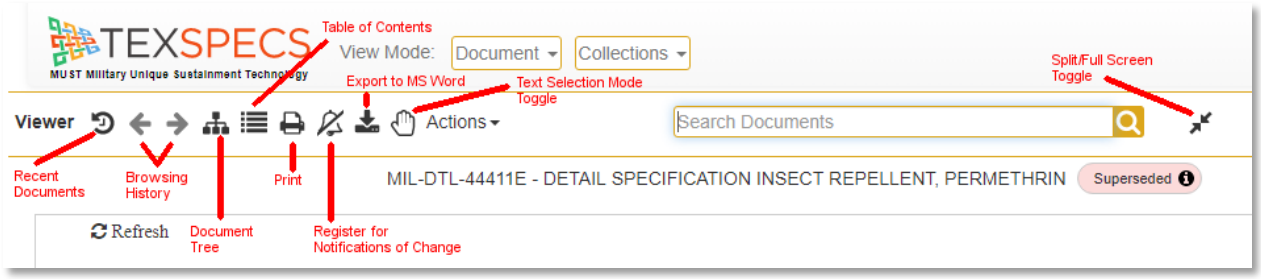
Viewer Controls

There are several controls available in the 'Document' mode, as shown here:



Recent Documents

Display a list of documents viewed in this session allowing for easy navigation to a document, and area within document that has been recently viewed.

Browsing History

The back and forward buttons allow navigation back and forth between documents in the viewer that have been opened and links that have been followed (both inter-document links and intra-document links).

Document Tree

Opens the Document Tree dialog which displays a list of all documents that are available.

Table of Contents

Displays table of contents as links that allow for navigation directly to document contents.

Print

The print button will print the document that is currently open in the viewer.

Register for notification of change

This controller registers you for email notifications if a newer revision of this specification is added to the system. This is not available for Draft documents.

Export to MS Word

The button will allow the document to be downloaded as a Microsoft Word document. For some publishers, the option to generate an exported document with draft formatting is provided as an additional option.

Text Selection Mode

Toggle between selecting text for copy and selecting text for transclusion. The button image changes when the text selection mode changes. It is a button with image of a hand when in transclusion mode and is the image of an arrow when in copy mode. This control is not visible when not in full screen since the text selection mode is transclusion. This control is not available when viewing draft documents. Draft documents are always in selecting text for copy mode.

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Split/Full Screen

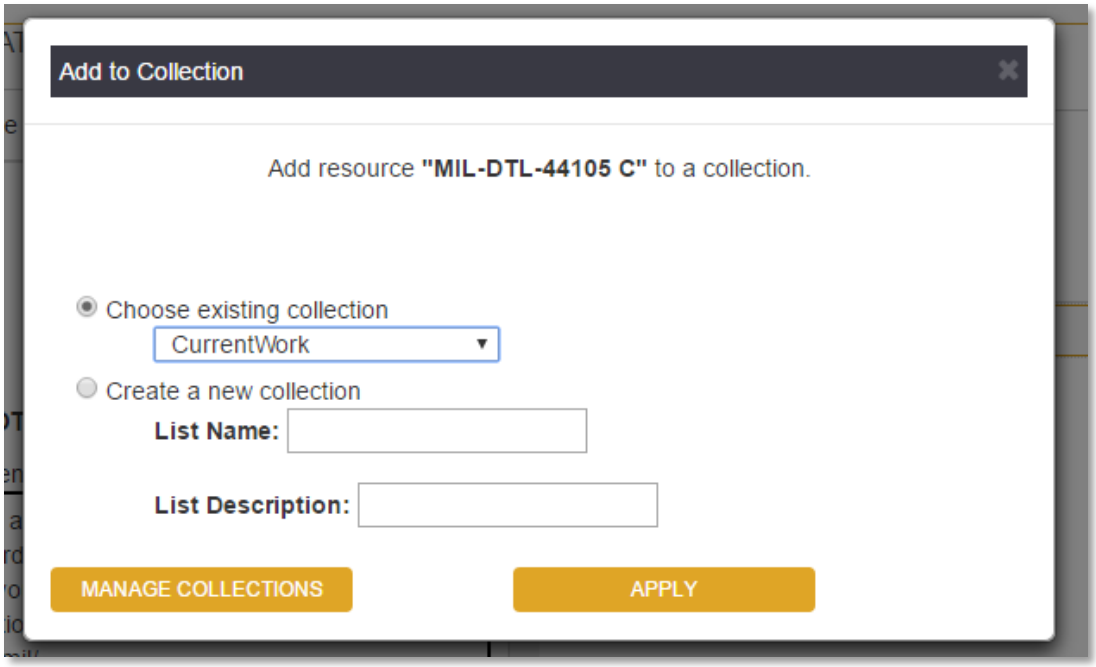
The split/full screen toggle will change the viewing mode between split and full screen. Any composition loaded will remain loaded.

Actions

The Actions drop menu includes menu items: Add Specification (Composition) to a Collection, Reference Analysis, Compare to Revision (Redlining), and Requirements.

Add Specification to a Collection

It is possible to add a Specification or a Composition to a collection while it is loaded into the viewer. A Collection is a way to gain quick access to documents or changes that you access frequently. It is possible to navigate by Collection. The menu item text will change depending on viewing a specification or composition in the viewer. You can add the document to an existing collection or create a new collection. This feature is not available when viewing draft documents.



Requirement/Validation View

This context menu is only available for specification titles that contain “Purchase Description”. When it is selected, it will generate a composition from the opened document, with Requirement sections and Validation sections paired up. Requirement section is in Section 3 of the document, Validation section is the Section in Section 4 referred from section 3. The generated composition is displayed in composer.

Reference Analysis

Use reference analysis to determine what specifications reference the specification in the viewer, menu item ‘References To’ and what Specifications this document references, menu item ‘References From’. Use reference analysis menu item ‘View Test References’ to determine what tests are referenced by this

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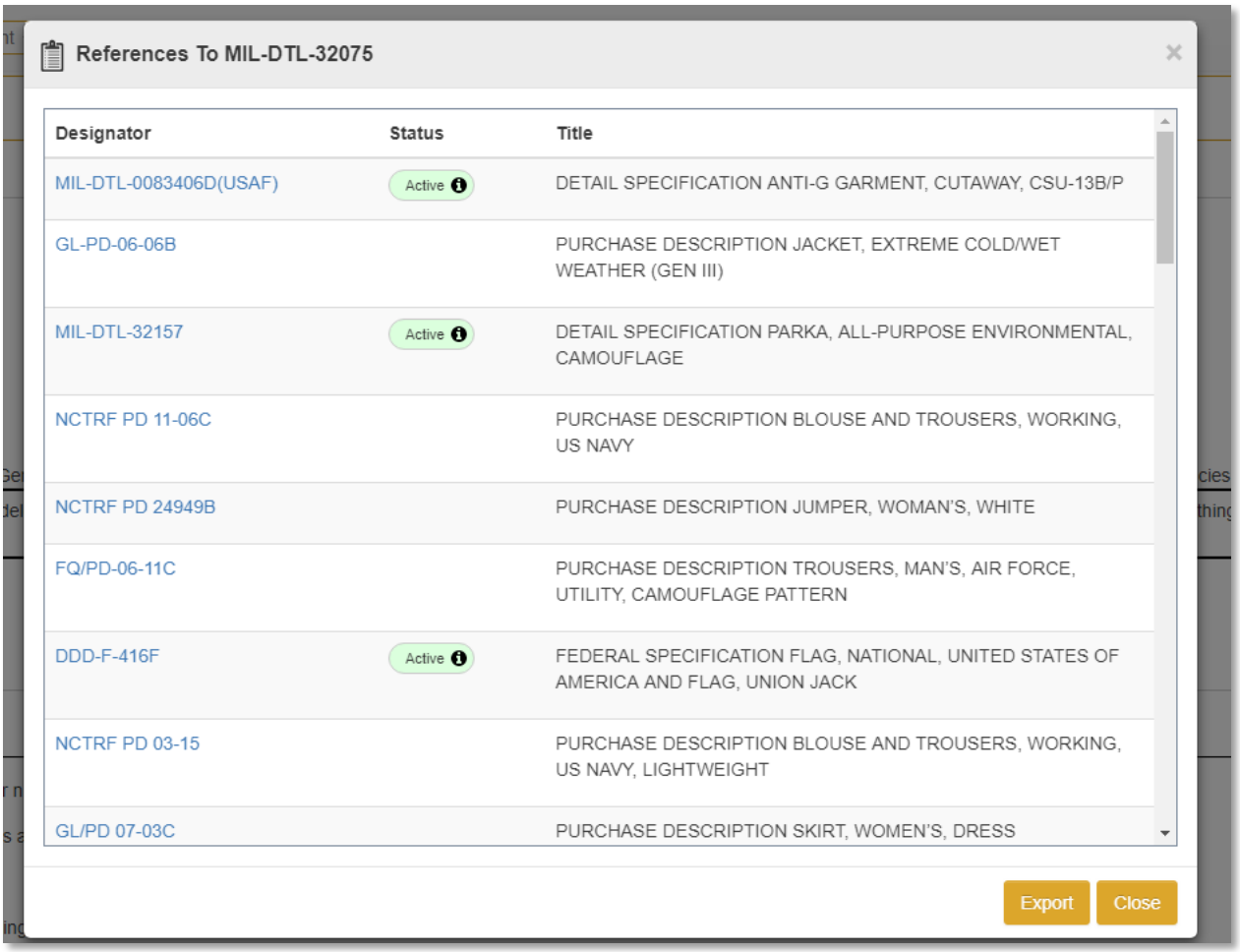
specification and where in the specification the reference occurs. A new dialog will open up displaying the requested data. The designation is a link to load that document into the viewer. Reference Analysis is not available when viewing draft documents.



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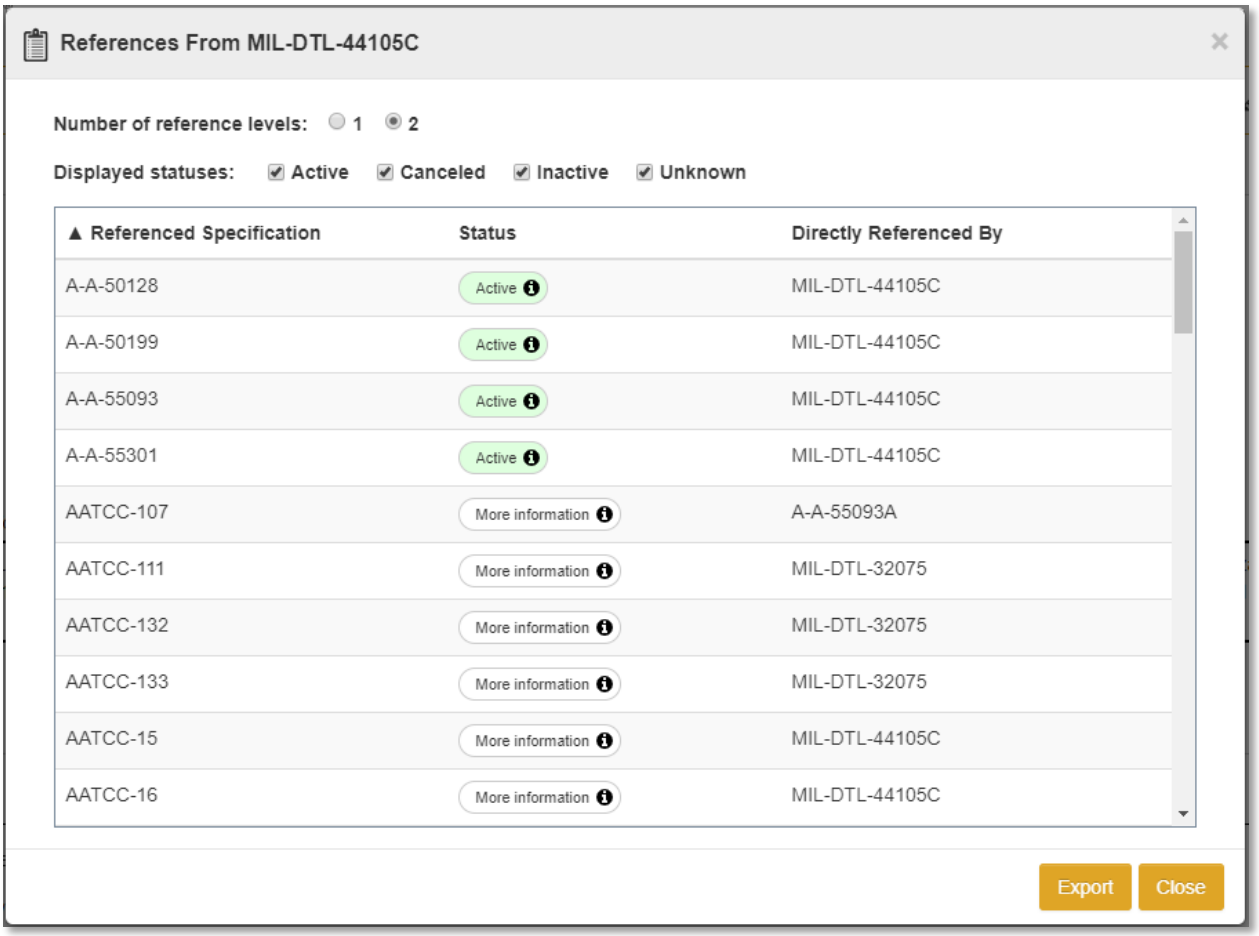

The “references from” modal contains an additional control that lets you select the number of reference levels. Reference level 1 finds the specifications referenced by the specification in the viewer and each additional level adds the specifications referenced by the referenced specifications.

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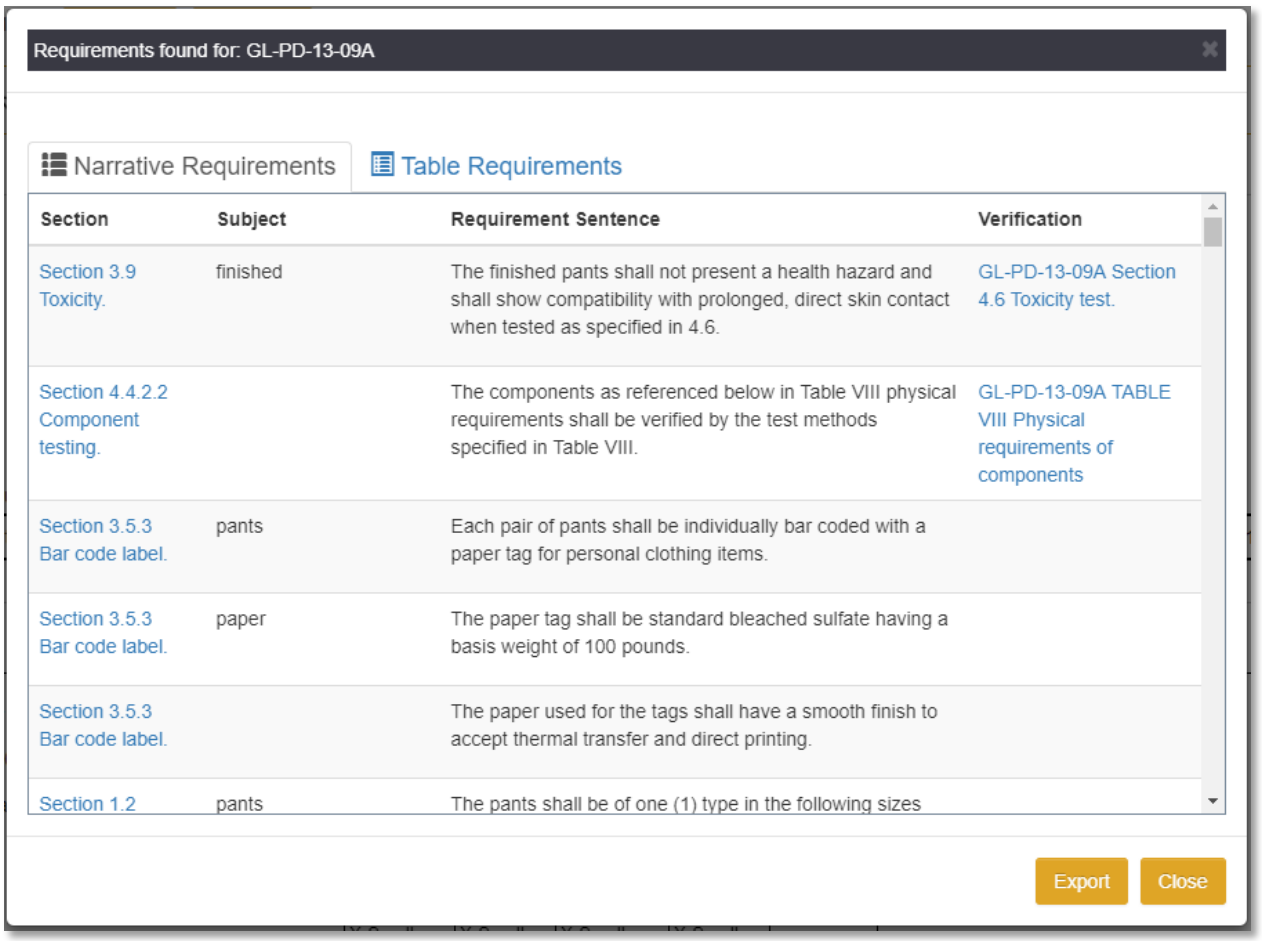
Requirements

Use Requirements to list structured requirements information extracted from the current specification. At present, this function is only available on a limited set of documents. There are two types of requirements data narrative and table. Narrative for sections that contain requirements. The data contains a link to the section that contains the requirement and the sentence that contains the requirement. It will also contain information about the subject of the requirement when matched with a controlled vocabulary. The Table tab contains requirements found in tables. The data contains a link to the table, subject and attribute data. If Verification information is available a link to the verification will be displayed. The export button allows all requirements to be exported to a CSV file.

Note: If the CSV text has Unicode characters, older versions of Excel will not display them correctly. The workaround is to use Excel's import function to import the text and specify the file origin. Open the Data ribbon, click select text, select your CSV file to import. In the Text Import Wizard select Delimited and select Unicode UTF-8. On the next page select the Comma delimiter and click finish.



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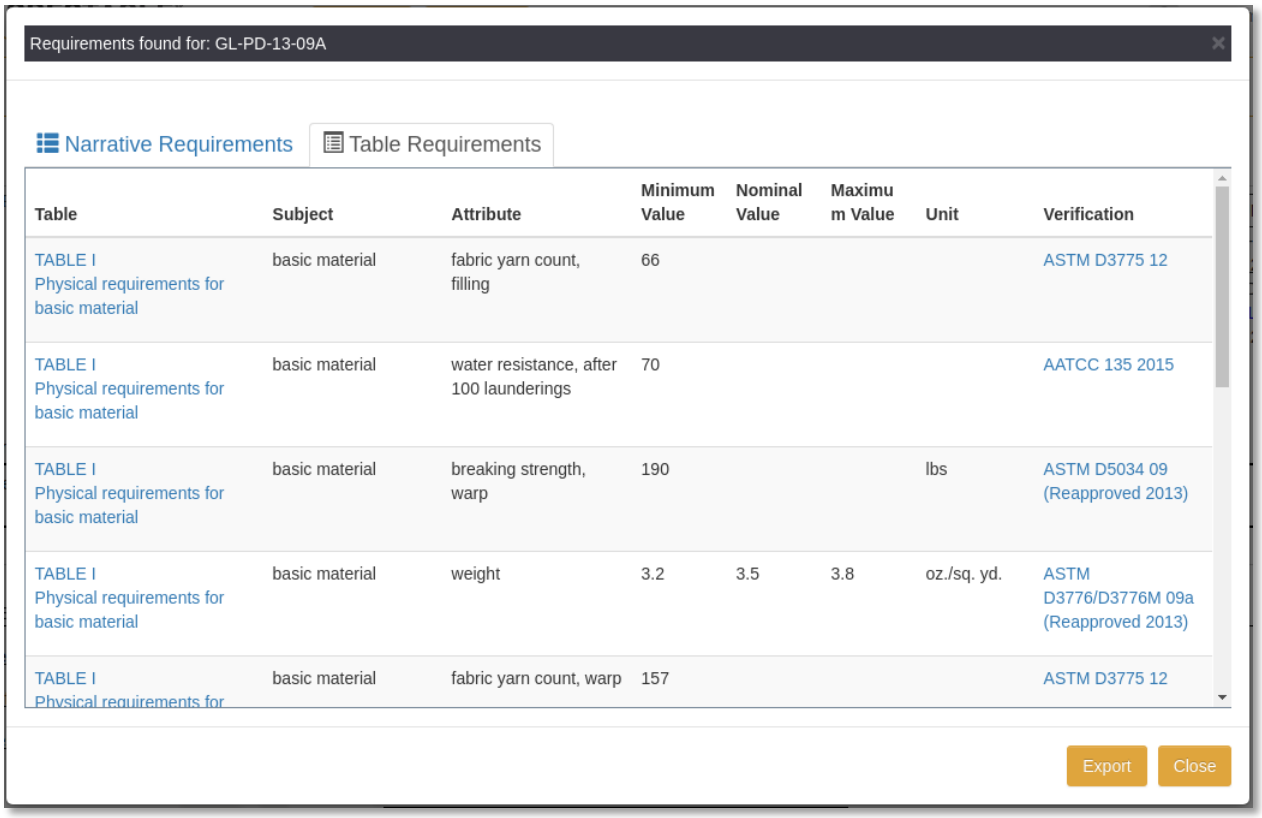

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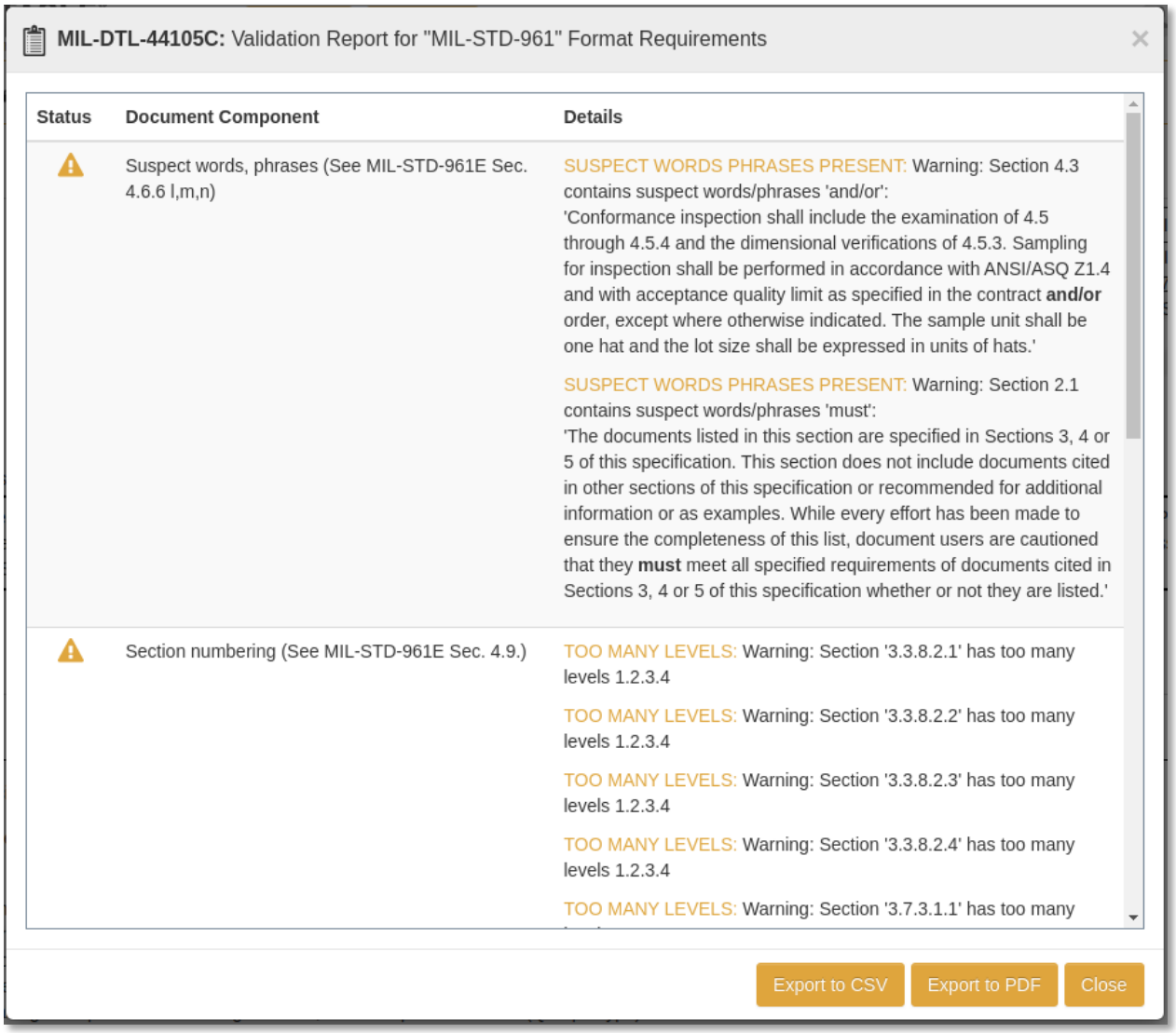
View MIL-STD-961 Format Report

MIL-STD-961 is a standard which covers the format and content requirements for DoD performance and detail specifications. In TexSpecs, we generate a report on a subset of MIL-STD-961 requirements for MIL-PRF-, MIL-DTL- and MIL-X- documents (where X is a single letter). In addition, we generate reports for Purchase Descriptions. When viewing on of these documents in TexSpecs, you may view the MIL-STD-961 format report to see how closely the current document adheres to a subset of requirements from the MIL-STD-961 standard. The link to the report is in the Actions menu.



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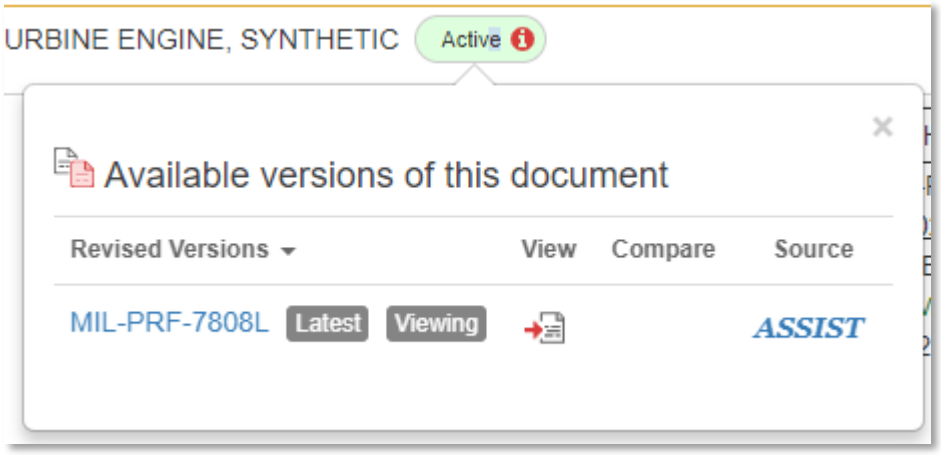
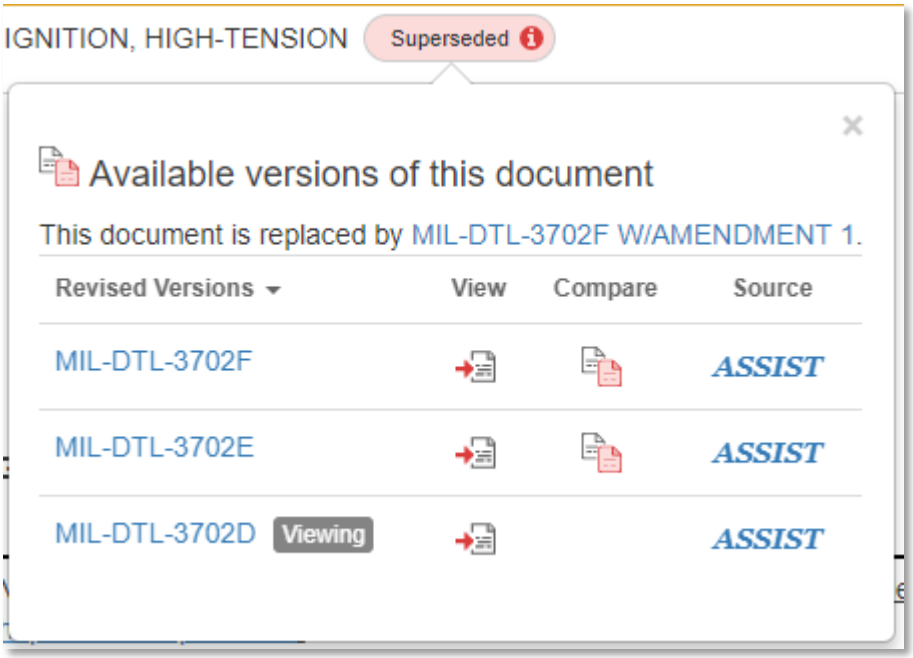
Document Functions

Document Status Information

If document status information is available for a document, it will be displayed alongside the document title. Here is an example of a document with a status of “Active”:



For documents that have been superseded by a newer version, the status will be displayed as “Superseded.” If an information icon appears to the right of the status box, clicking on it will display a popup. The popup allows the user to redline with or navigate to later revisions of the document if they are available in MKB or will provide a link to an external site where the user can find out more about the superseding document if the document isn’t in MKB.



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Pressing a document's revision link or the "View Document" button will open the corresponding document in the viewer. Pressing the "Compare Versions" button will display a redline comparison between the current document and the selected document. Pressing the "ASSIST" button will open this revision in ASSIST quick search. The latest indicator shows which document is the latest revision. The viewing indicator shows which revision is currently being viewed. The documents can be sorted from latest to oldest, or oldest to latest.

For documents that are cancelled the status will be displayed as cancelled. An information icon appears to the right of the status box, clicking on it will display a popup. The popup will have links to View the replacement specification if one exists and lists versions of this specification.

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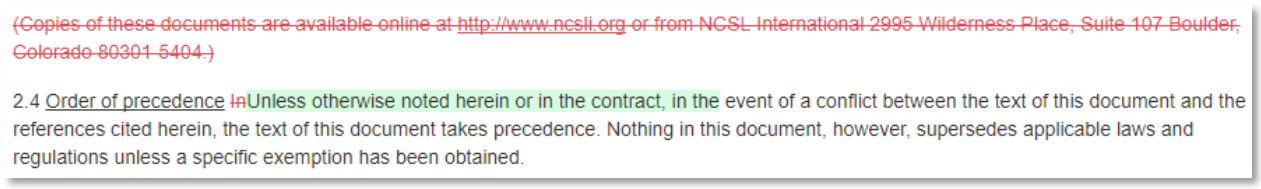
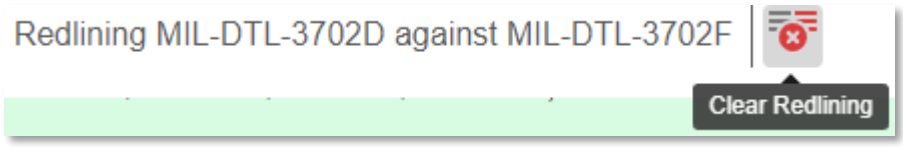
Redlining

Click the compare versions button to view redline comparison, content that has been added in the newer version will be displayed with a green background. Content that has been removed in the newer version will be red and have a strikethrough effect. Text that has been modified will be shown via the combination of removals and additions.



To stop viewing a redline comparison and restore the standard document view, click the Clear Redlining button which appears at the top of the viewer.



Additional Redline Documentation

Draft Redline Comparison

Interim Change Redline Comparison

Transclusion Redline Comparison

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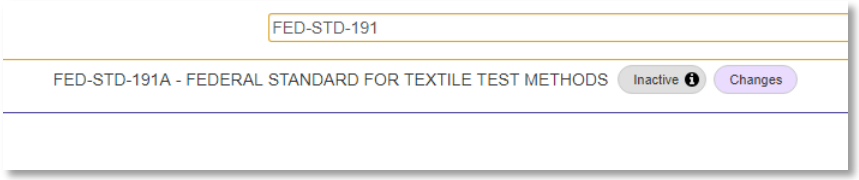
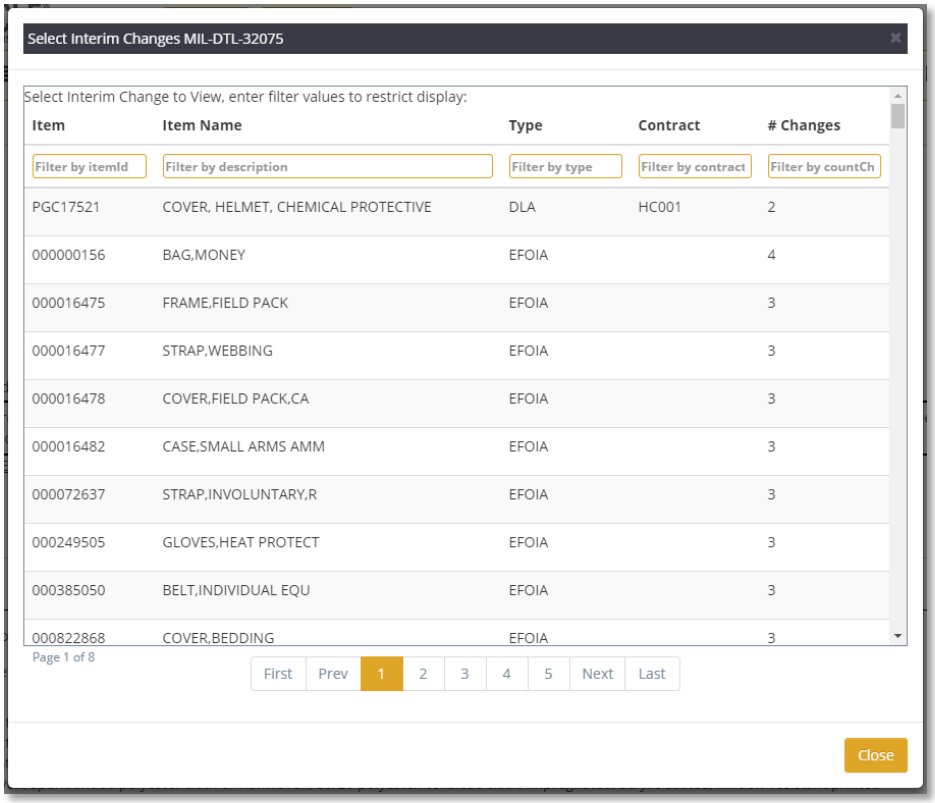
Interim Changes Button

If the document in the viewer is a specification that has interim changes associated with it, then a Changes button will appear in the title bar.



The Changes button will open a dialog allowing you to select what set of interim changes you wish to annotate the document with. Changes are grouped by item, type, and contract (where applicable). The three types of change are "EFOIA" (from public sources, available to everyone), "DLA" (supplied by the Defense Logistics Agency, only available to select users), and "USER" (only visible to the user that added the change).



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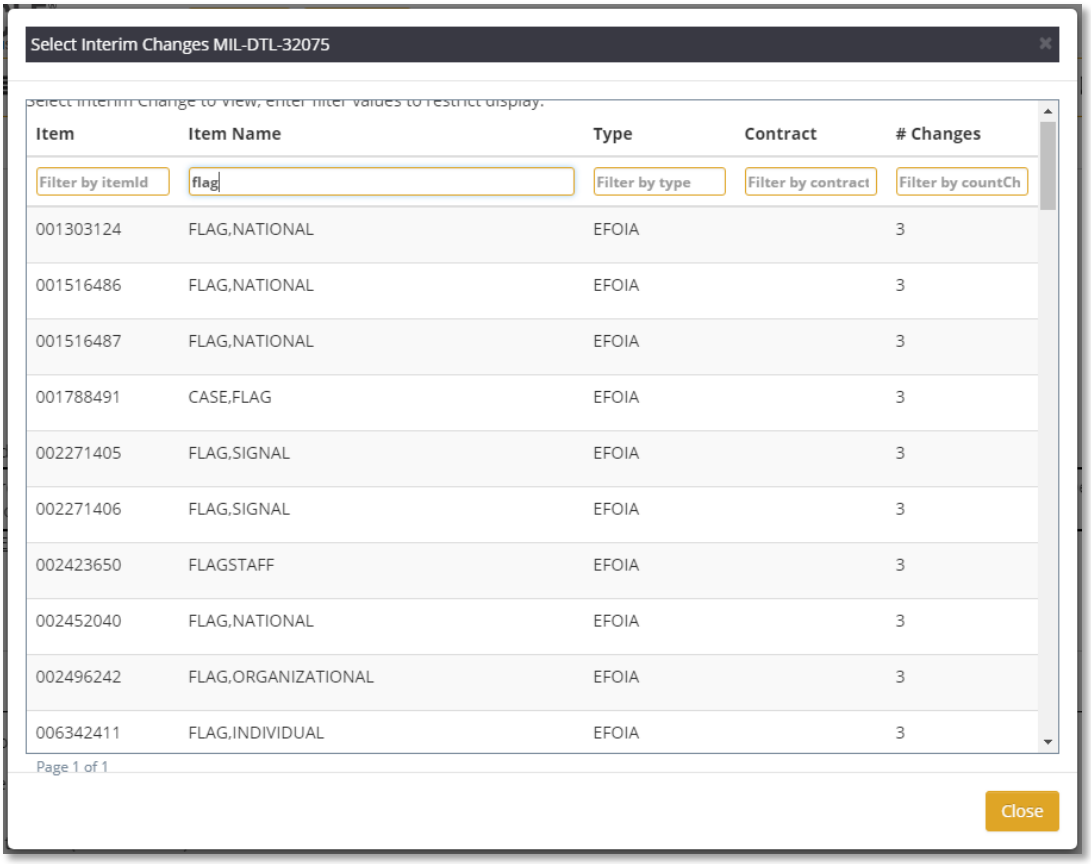
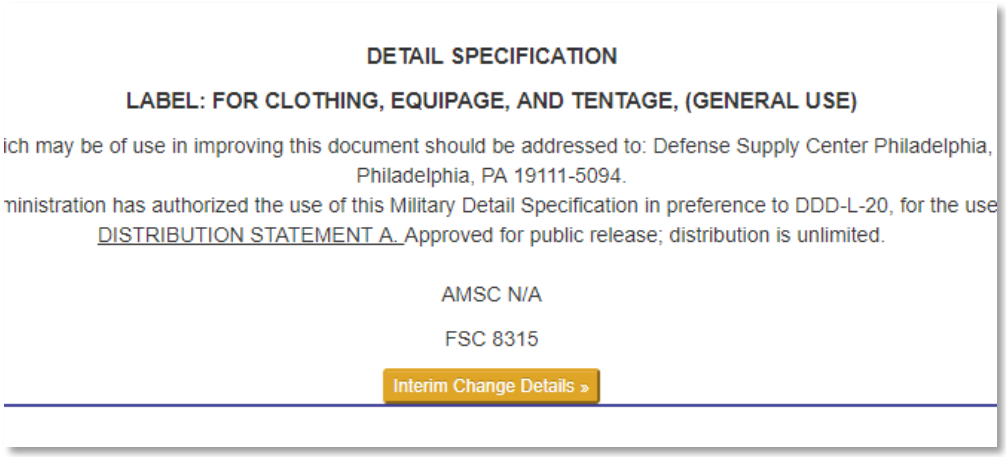
The user can enter values on which to filter for one or more of the columns. Filter operates to match on any row that contains the entered string, so the entered value may appear anywhere within the string.



When the desired item is located, clicking on the Item field will apply the Interim Changes to the document, as indicated below.



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The  symbol is used to indicate if a section, or entire document, has interim changes associated to it. When the button is selected, a table containing the interim changes for that section (or the document) that meet the filter criteria will be displayed. Clicking on the 'Details >>' button will open a dialog with details specific to the change type.

If the interim change instruction is "Delete and substitute" then a button to toggle a redline comparison will be visible. Upon clicking the button, a redline comparison will display as follows.

The comparison can be cleared by pressing the toggle button again.

To clear your selected Interim Changes, press the Clear Changes button in the title bar.

Additional Interim Change Documentation

Create Interim Change
View Mode: Interim Change

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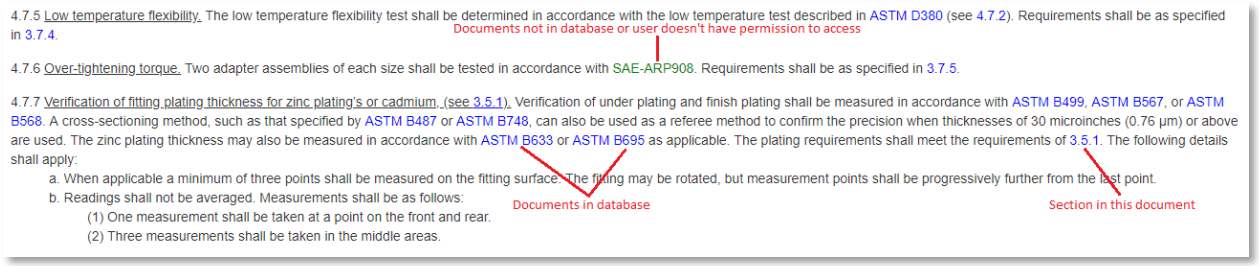
Links

Within the displayed document, some of the text will be blue. These indicate links to footnotes, links to other locations in the specification, and links to other specifications the user has access to. Positioning the mouse over a footnote link will cause the footnote to be displayed. Selecting a footnote link will bring you to the location of the footnote in the document. If the link references another section, table or figure in the current document, a message with a brief description of the new location will appear when the mouse is positioned over the link. Selecting the link will bring you to the referenced location in the document. When the blue text is a reference to another specification, clicking the text will either load the other specification into the viewer or display a popup with a link to load the document at the source (except when semantic links are available, see below). Green colored specification references indicate documents that are not currently in the SWISS database or the user doesn't have access to. To return to any previously opened document, click the "History" icon.



Semantic Links

For some links to external documents in specifications, suggested "semantic" links are provided. These are targeted links based on classification of the source and target document sections.

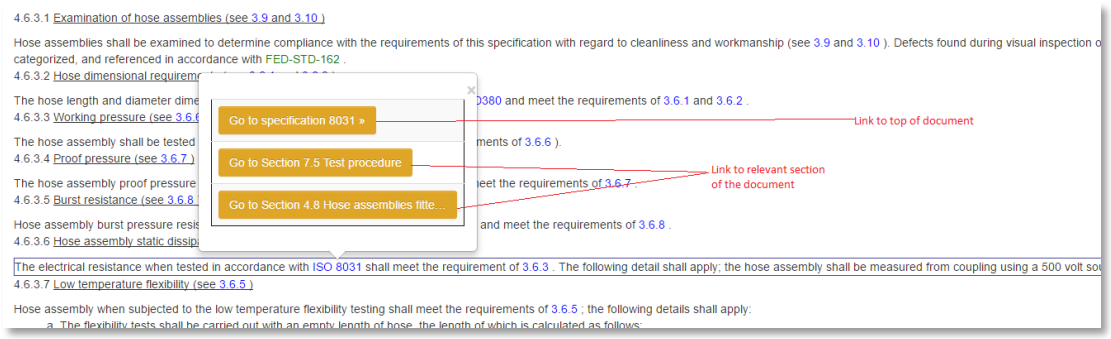


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Table Export

Tables can be exported in CSV format. To do so, right-click on a table, and click the “Export Table as CSV” option in the menu that appears.

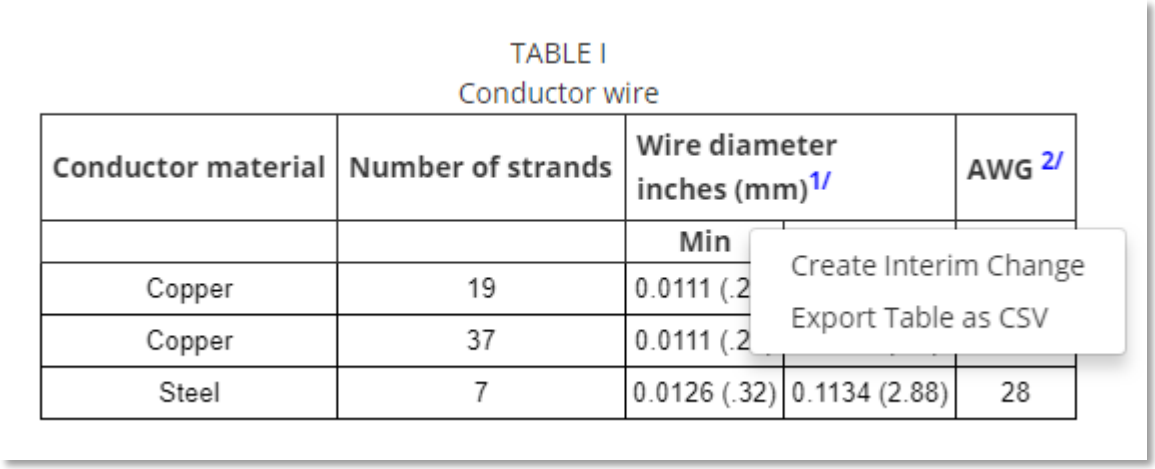

TABLE I
Conductor wire

Conductor material	Number of strands	Wire diameter inches (mm)[1/]		AWG [2/]
		Min		
Copper	19	0.0111 (.2		
Copper	37	0.0111 (.2		
Steel	7	0.0126 (.32)	0.1134 (2.88)	28

When clicking this option, a csv formated file will be downloaded.

Note: If the CSV text has Unicode characters, older versions of Excel will not display them correctly. The workaround is to use Excel's import function to import the text and specify the file origin. Open the Data ribbon, click select text, select your CSV file to import. In the Text Import Wizard select Delimited and select Unicode UTF-8. On the next page select the Comma delimiter and click finish.

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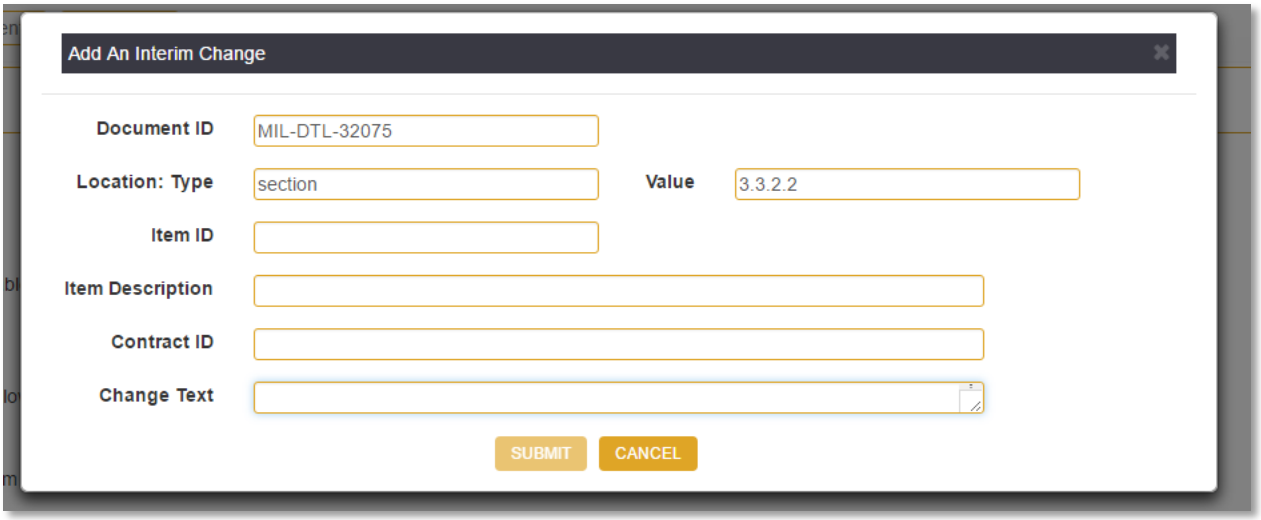
Create Interim Change

An interim change can be entered for any section or table of a specification in the viewer. This is accomplished by right clicking on a section, table, or figure, selecting “Create Interim Change” in the context menu that appears, and finally completing part or all of the “Add An Interim Change” form. Change Text is a required field. The document ID, Location Type and Value are auto populated. For the interim change to be applied to the entire document, right click the specification’s front matter at the top of the document.



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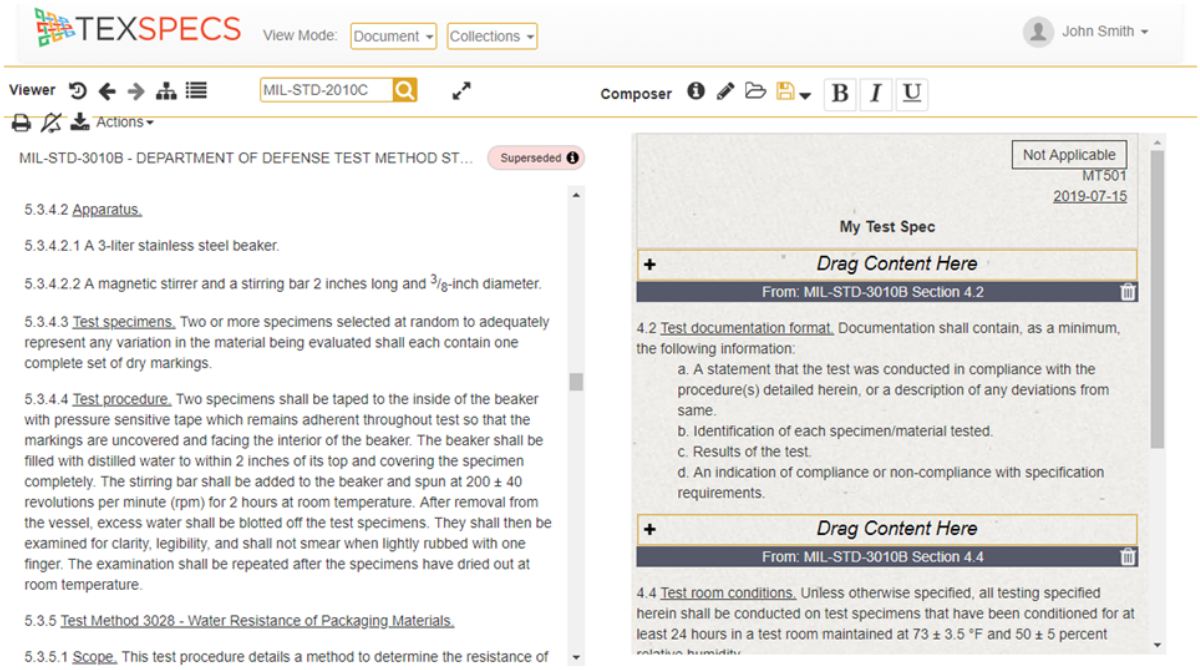
Composer

The “Composer” section of the document view window allows users to create derivative documents, called “Compositions”. Compositions may include parts of other documents by reference, called transclusion. This allows the user to create, for instance, a work instruction that uses targeted sections from other documents.

The figure below shows an example of a loaded composition (in the right-hand pane) and specification (in the left-hand pane).



Sections of the specification can be dragged (transcluded) into the composition at the insertion points. Text can be entered at the insertion point. Titles for the text entered can be changed. Sections in the composition can be re-ordered. The updated composition can be saved by clicking the “floppy disc” icon. The change indicator will be displayed on a banner of a composition section if there is a new version of the transcluded content. Clicking on the change indicator opens a dialog that will specify what the newer version is and allow for the showing of a redline between the versions. It will also indicate if the section transcluded is specifically changed. The change indicator will be green if there is a newer version but the transcluded content hasn’t been changed. The change indicator will be gold if there is a newer version and the content was changed and will be red if the transcluded content was deleted in the newer version.

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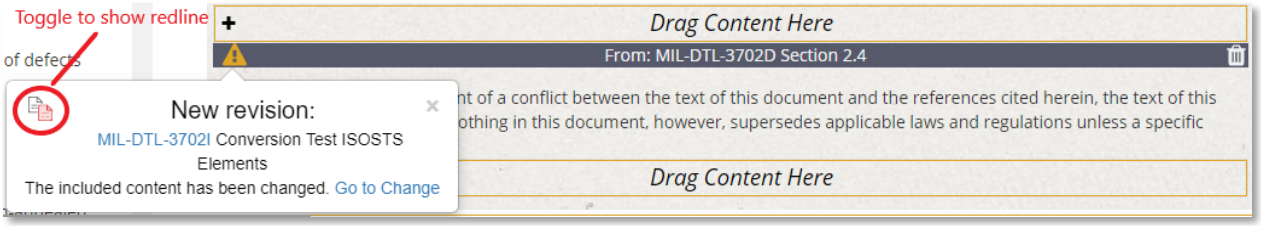
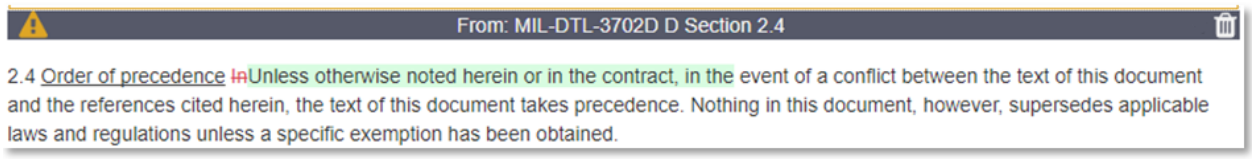
Show Redline

Clicking the toggle redline button will show a redline between the transcluded content and the latest revision of the document.





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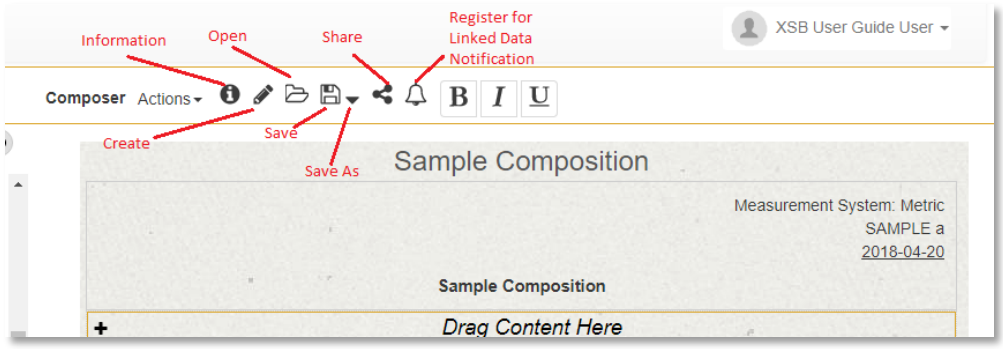
Composition Controls

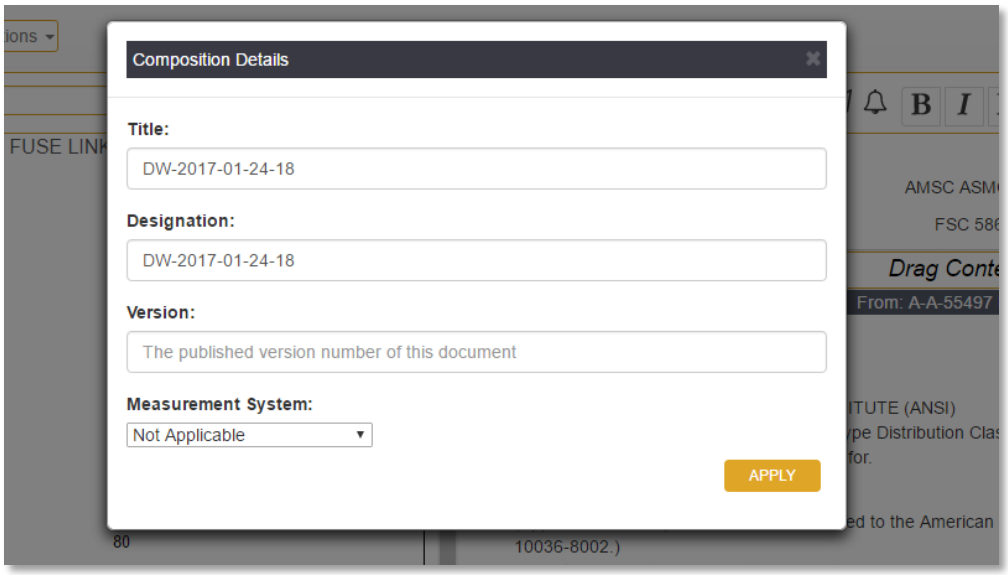


Actions

The composer actions menu contains menu item to add the Composition to a Collection.

Information

The title, designation, version, and measurement system can be modified using the information dialog



Create

This brings up a blank information dialog and is used to create a new composition.

Open

To open a preexisting composition, click the folder icon on the right side of the screen. A new window with a list of formerly created documents will open. This list consists of all compositions the user can view and/or edit. It includes compositions that have been shared to this user but can only be loaded into the viewer. A composition can be opened in the composer (the right pane) or in the Viewer (the left pane) by selecting either of the two buttons next to the name of the composition. If the user can only read and not edit the composition the “Open in composer” button is disabled.

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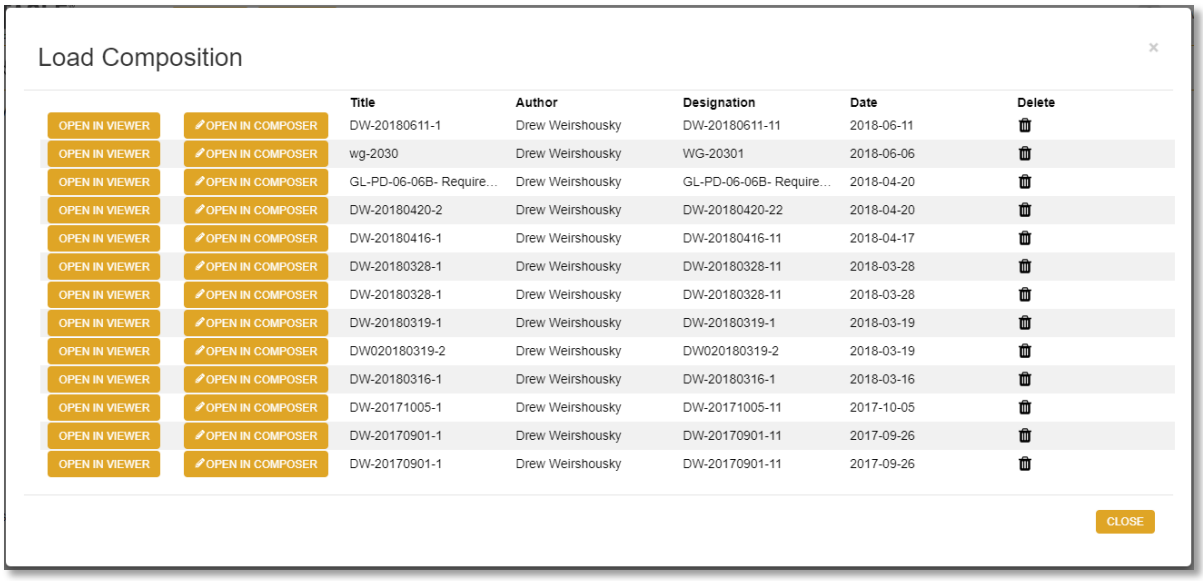

Save

This control saves the current composition. The color of this button indicates the save state. When there are unsaved changes, this button turns an orange color. If there is an error saving the save button will turn red

Save As

This control opens the information dialog so that a new designation can be entered. This creates a copy of the current composition. A warning will be given if you try and save this composition with the same designation as an already existing composition.

Share

This will grant read access on your composition to someone else. You enter the email address of the person you want to give access to. That user will be able to load your composition into the viewer.

Register for Linked Data Notification

This controller registers you for email notifications if a newer revision of transcluded content is added to the system.

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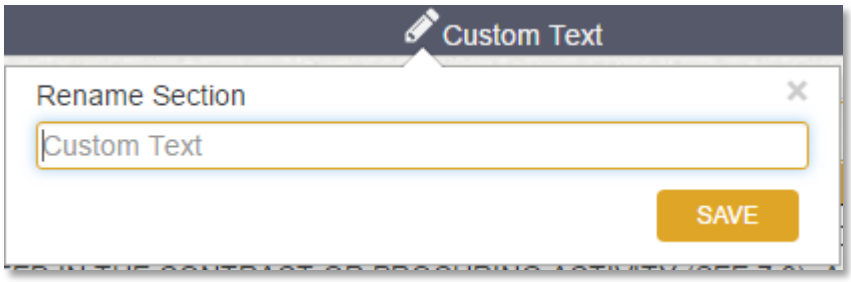
Composer Section Banners

Pencil

The pencil in the banner for custom text allows the user to edit titles of custom text sections.



Trash Can

The trash can is used to delete a transcluded section in the composer view.

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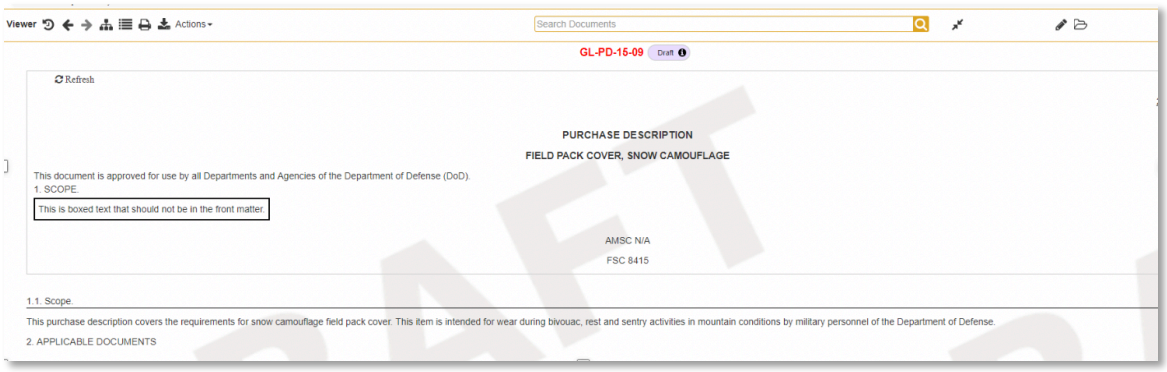
Drafts

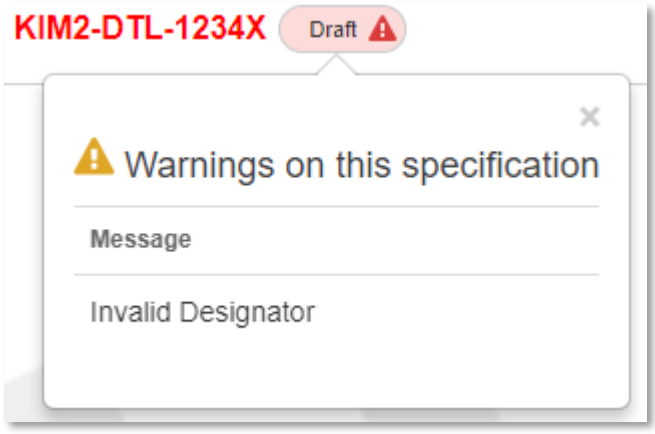
Draft documents are only viewed in the viewer pane. Draft documents may not be transcluded into compositions. Drafts may only be navigated to from the document tree. Draft documents use a subset of the view controls and actions of specifications. When viewing a draft document at the top of the viewer is displayed the designator instead of the title in red followed by the word draft. In addition, the background of the viewer is different for draft documents. It is not possible to create or view interim changes on a draft document.

A draft document loaded into the viewer:



Draft Warnings

If there are any warnings preventing a draft from being published, the chip to the right of the designation will display with a red background. Clicking the chip will open a popover containing the warnings for the draft.



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Draft Actions

A draft without warnings will display a purple chip to the right of the designation. Clicking the chip will open a popover containing the actions you can perform on the draft.

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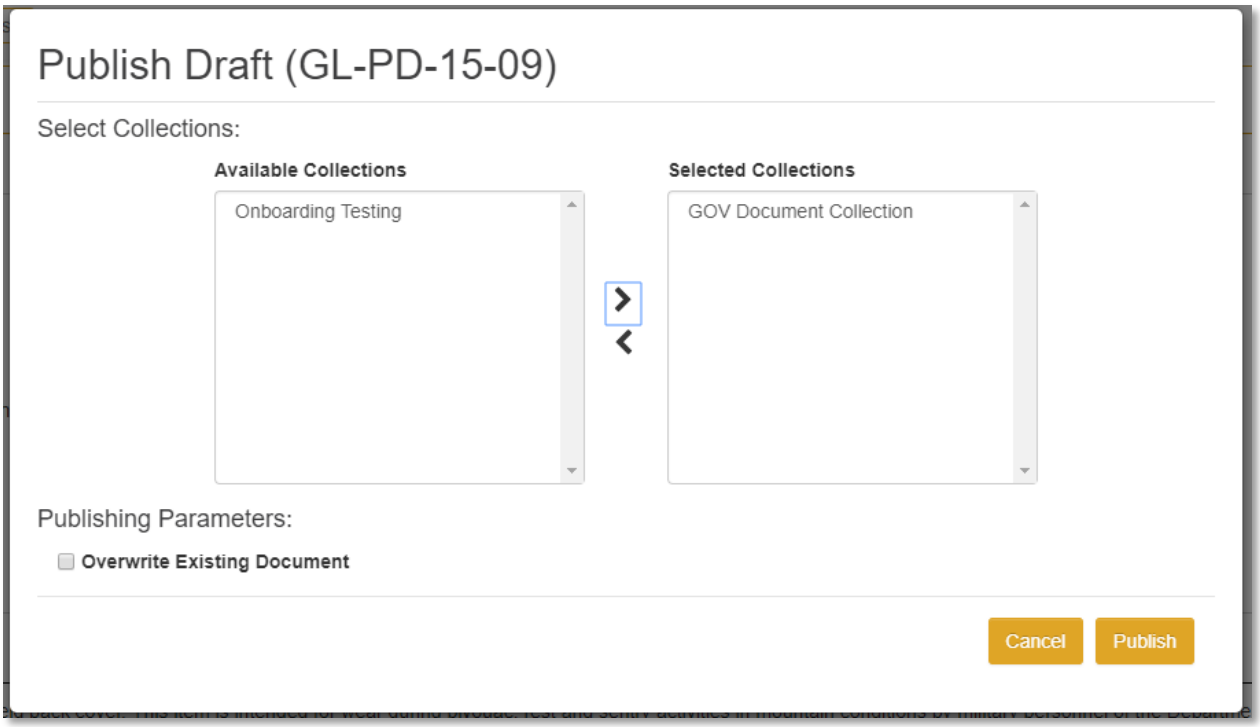
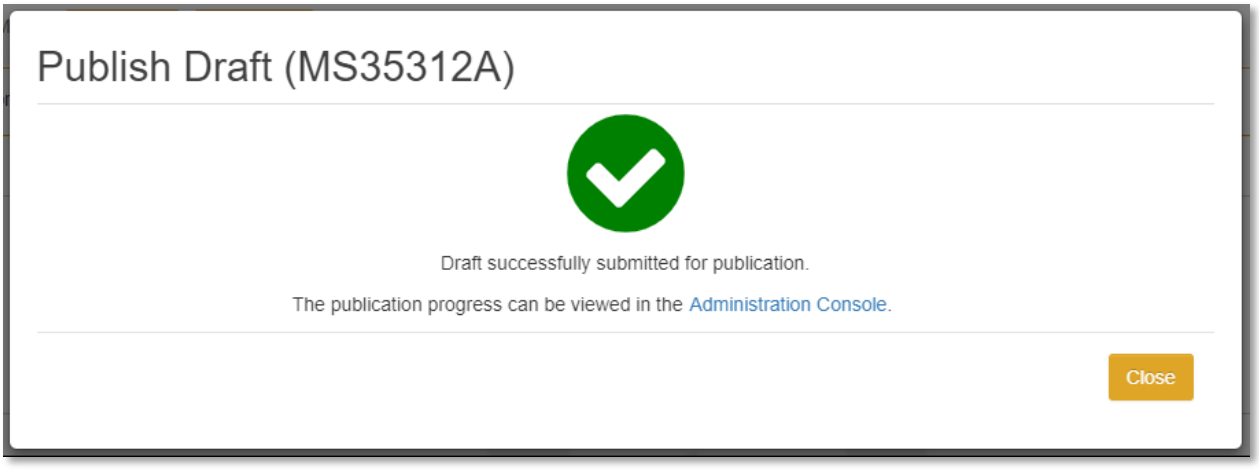
Publish Draft

The publish draft action will open a dialog for publishing the draft as a document. You must select the collections the document will be published to and if existing documents should be overwritten.



Clicking the publish button will submit your draft for publication. The progress of the publication can be viewed in the MKB Administration Console. Once the modal is closed the draft will be reloaded and will display in the publishing state.



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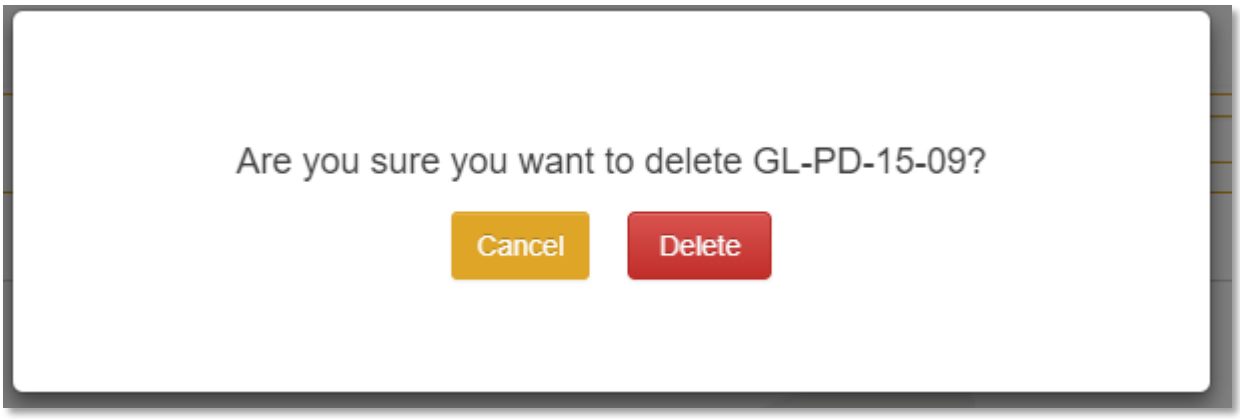
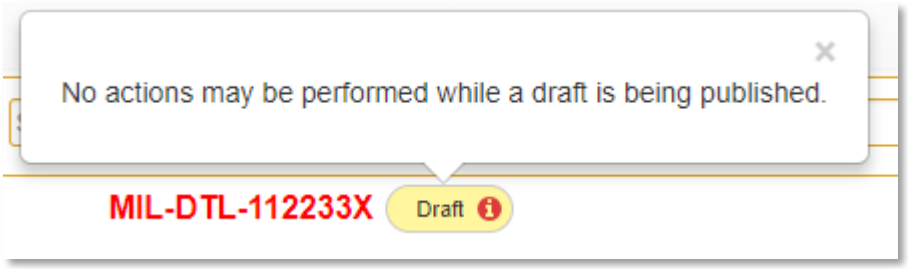
Delete Draft

The delete draft action will open a dialog confirming the deletion of your draft. The draft will be delete upon clicking the delete button and cannot be recovered.



Publishing Draft

A draft that is currently submitted for publishing will display with a yellow draft chip and no actions may be performed on the draft. If publishing succeeds, then the draft will be deleted and will be available in the system as a document. Upon failure, the draft will return to its original state and will display a purple chip.



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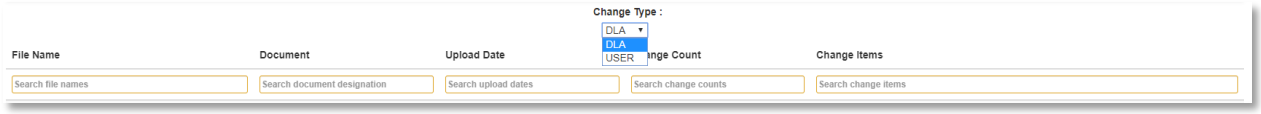
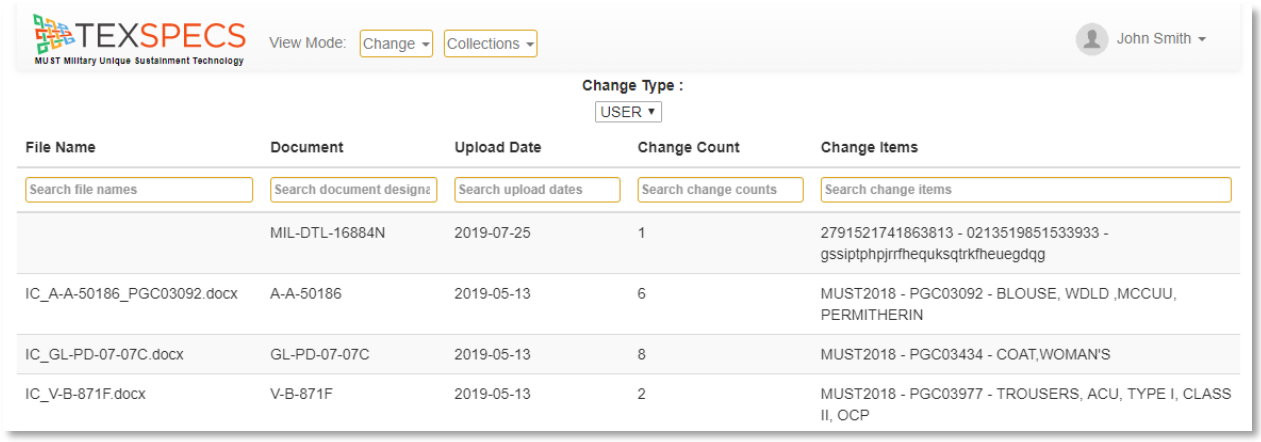
View Mode: Interim Change

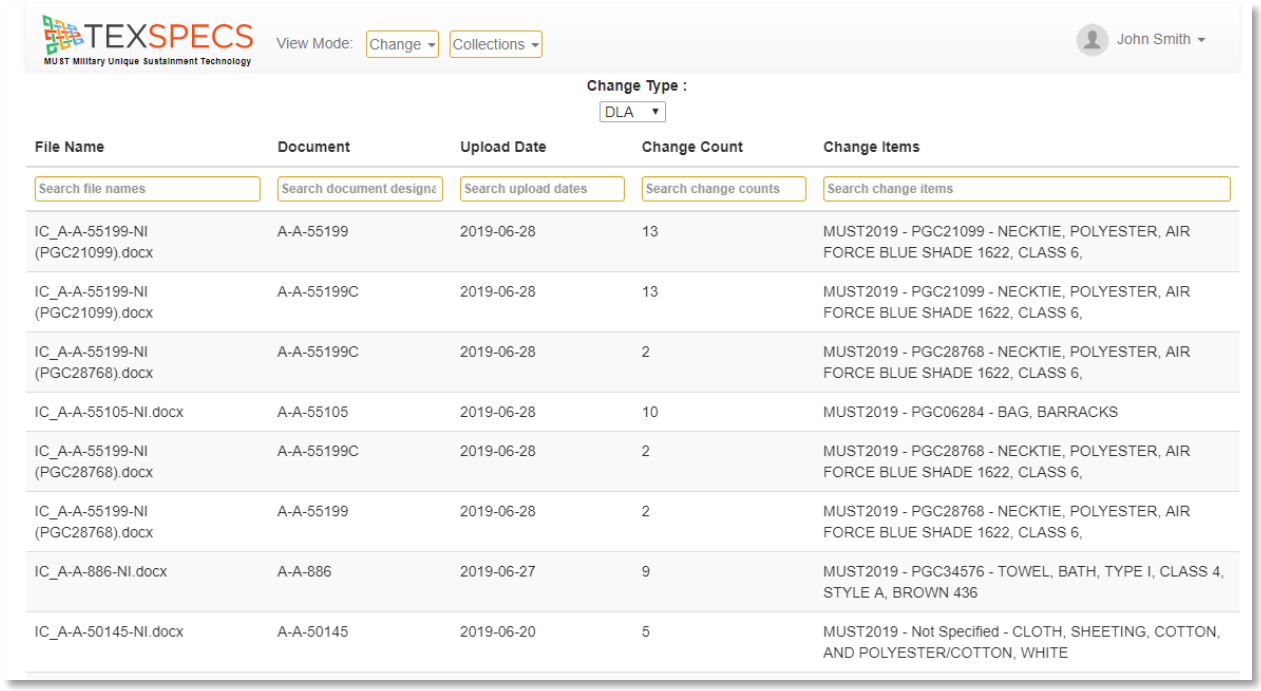
This page allows the user to view User and DLA interim changes. The interim change type can be changed by selecting type from the Change Type drop down. User type are changes manually added by the user. DLA type are changes uploaded and then published by the DLA.



User Type:



DLA Type:



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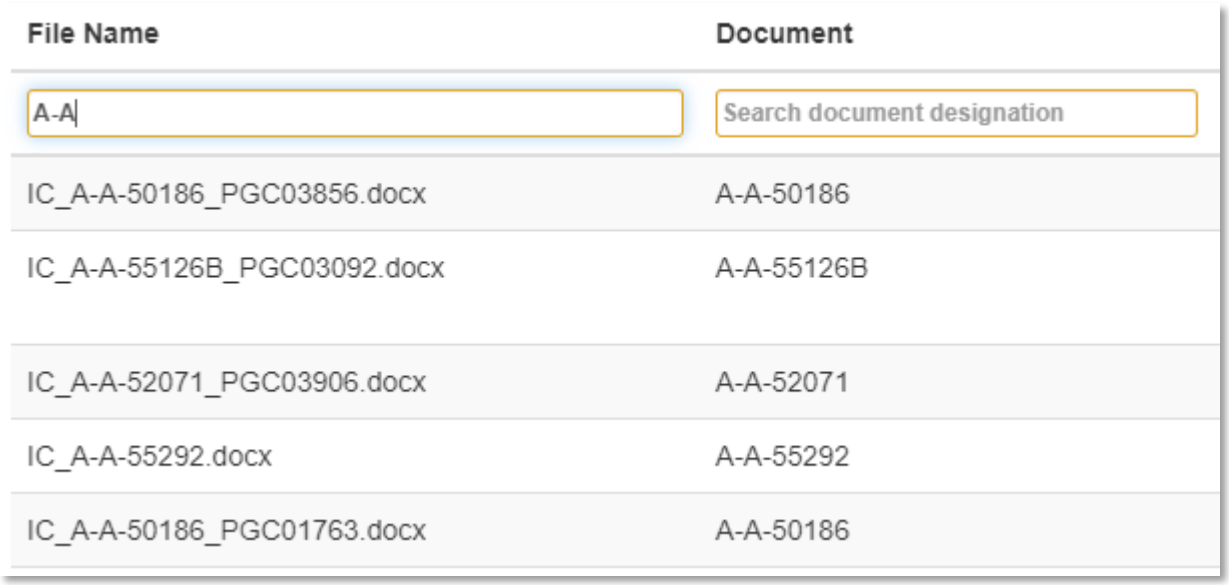
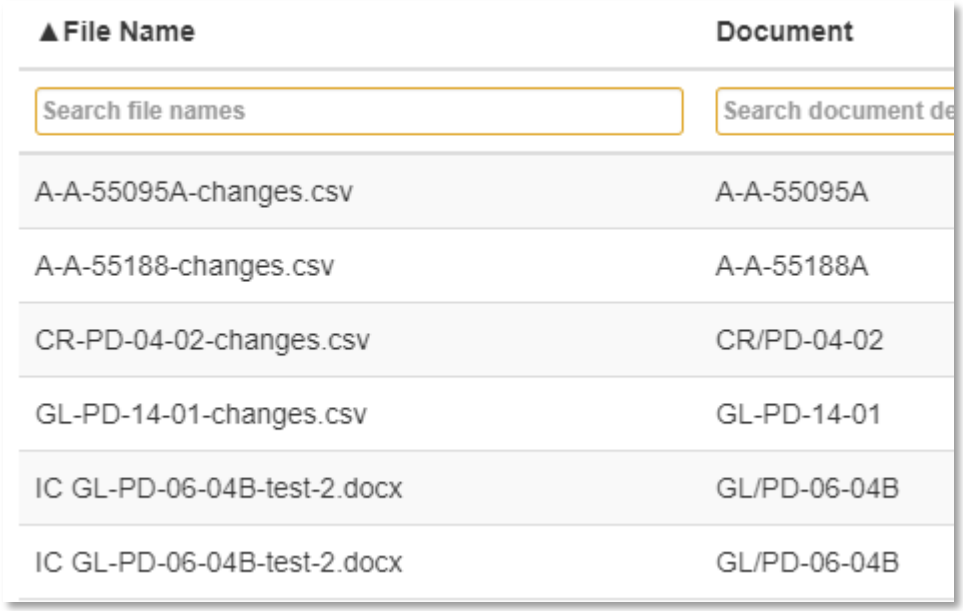
Each column can be filtered by entering text in the text box below the header for that column.



IC entries can be sorted by clicking on the column header. Clicking again will reverse the sort order.



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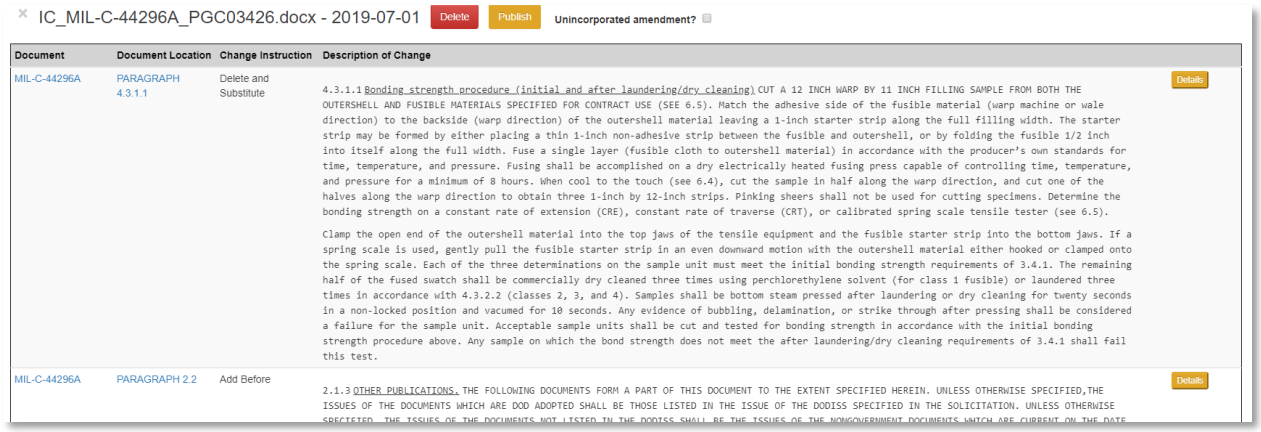
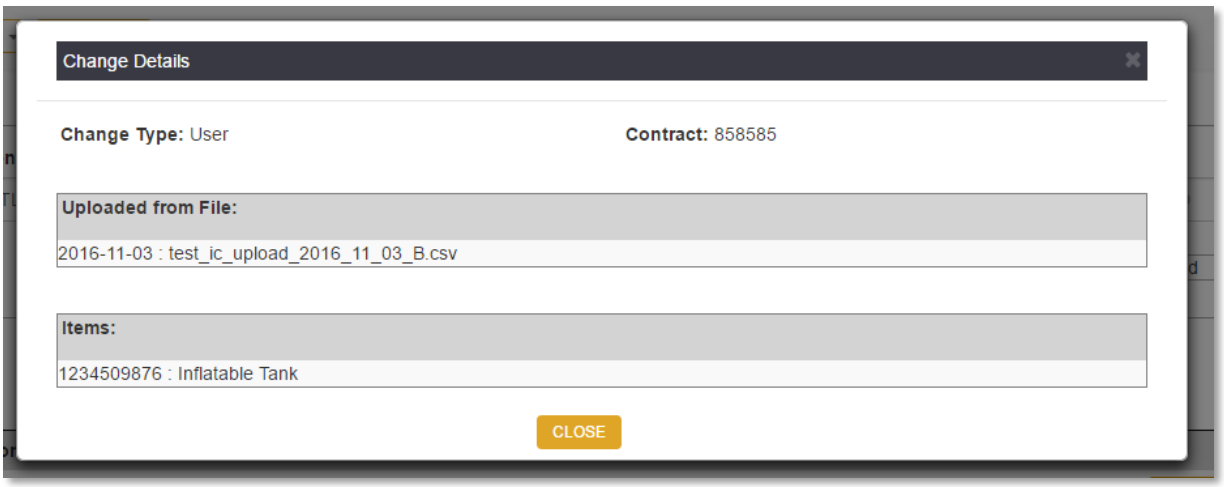
Clicking on a user interim change will bring up the interim change upload details. If you have the appropriate user permissions, a delete and/or publish button will appear at the top of the page. Additional permissions are required to publish a user interim change as an unincorporated amendment. Deleting the interim changes is permanent and you will not be able to recover them. Publishing the interim changes will change their type to DLA by default and an unincorporated amendment when the check box is selected. Upon a successful deletion or publish, you will be returned to the list of uploads and your interim change upload will no longer appear in the list.



The document and document location are links to documents if they are in our library and specific locations in the document if the location was specified in the interim change. The details of the items associated with each change can be displayed in place by clicking the 'Details' button. The information displayed depends on the change type of the interim change.

Change Type User Details:



View Mode: Collection Manager

Collections are groups of resources that are used for quick navigation to data that the user accesses frequently. Resources include compositions and specifications. There is a Collections menu in the navigation bar. The collection manager may be used to create a new collection, remove a collection, or remove items from an existing collection. It can also be used to change the title and/or description of a collection. Items displayed in the collection manager may be clicked to navigate to that resource.

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TexSpecs ADMINISTRATION CONSOLE USER GUIDE

December 2019 Release

swiss-support@xsb.com

Contents

TexSpecs Administration Console User Guide

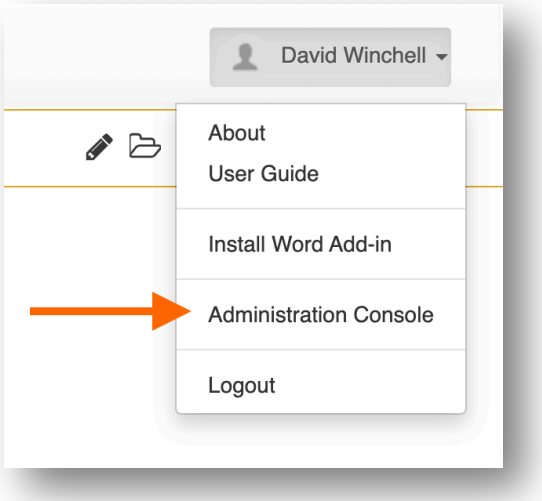
TexSpecs Administration Console is a user interface (UI) for the administration of the MUST/TexSpecs Knowledge Base (MUST KB). It is designed for performing all administration tasks for TexSpecs. Currently, its main functionality is to allow onboarding (adding) new specifications and standards to TexSpecs.

Document Onboarding consists of three steps. These steps are “Select Documents”, ”Select Document Collections”, and ”Onboard Documents”. Each step needs to be completed to add new documents to TexSpecs. You can navigate between the steps by clicking the Step number and title at the top of the page or by clicking Next or Back buttons on the bottom of the page.

TexSpecs Administration Console User Interface

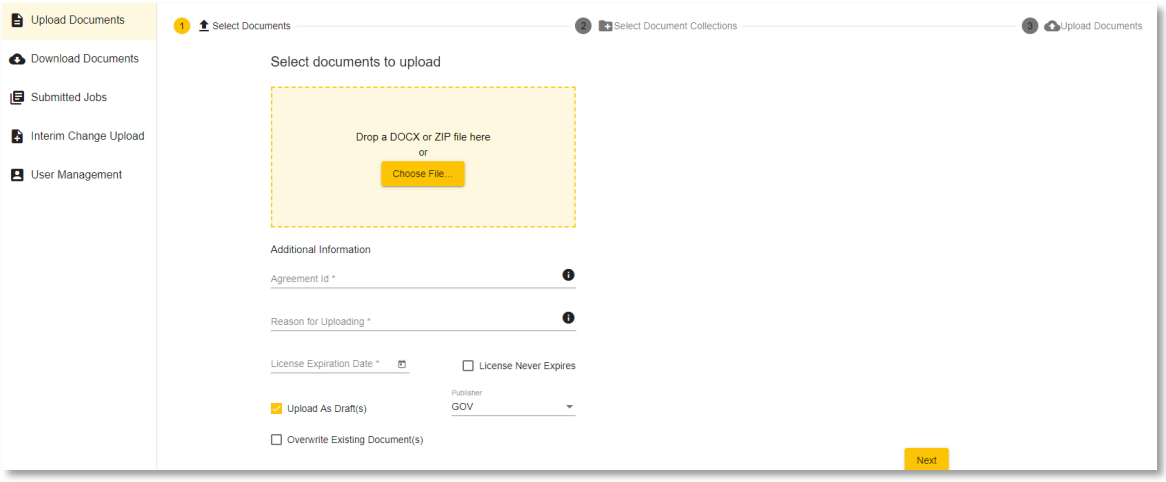
Accessing the console

The console can be accessed from the user menu in the upper right corner of the main TexSpecs window as shown below.



Document Uploading

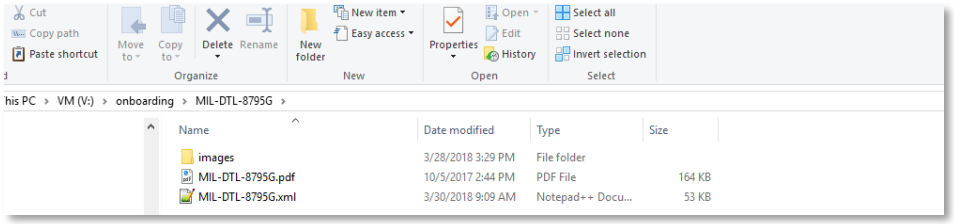
After successfully logging in, a page will be displayed which contains a tab for Document Uploading. The Document Uploading tab contains three steps.



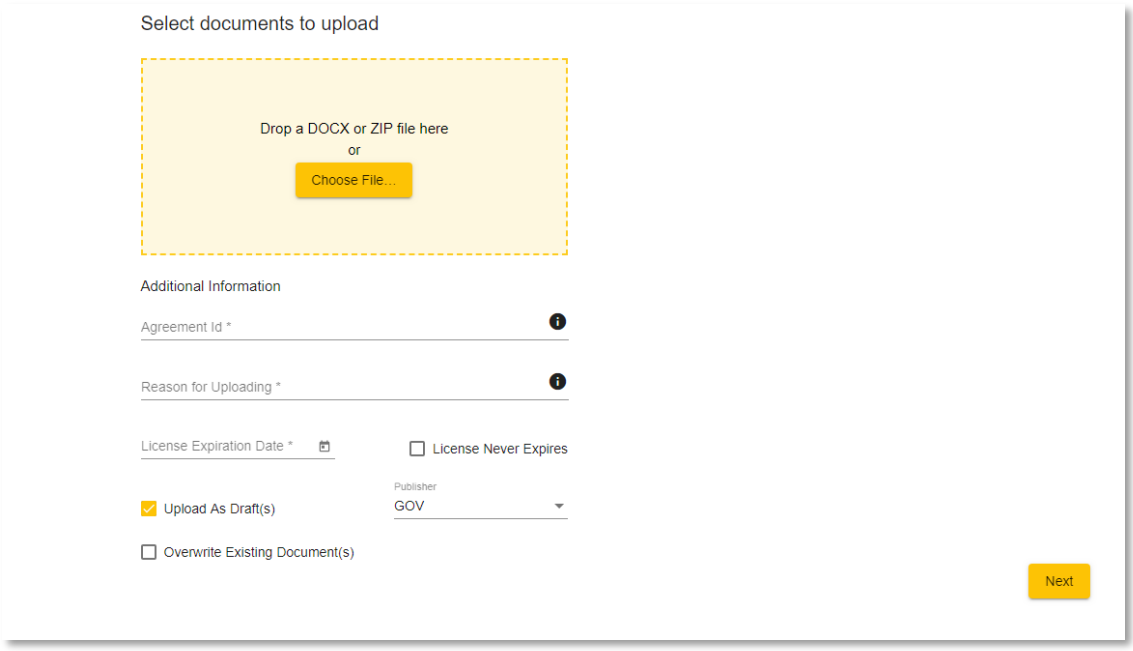
Prepare files to be uploaded

You can upload ZIP files containing DOCX and XML files or you can upload DOCX files directly.

If uploading ZIP files, the documents in the ZIP file must be contained in their own directory within the Zip file. Each document directory shall contain the document as ISOSTS XML or DOCX. Each document directory may contain the document as a PDF file and a sub directory called “images” that contains the documents images. A sample document directory follows.

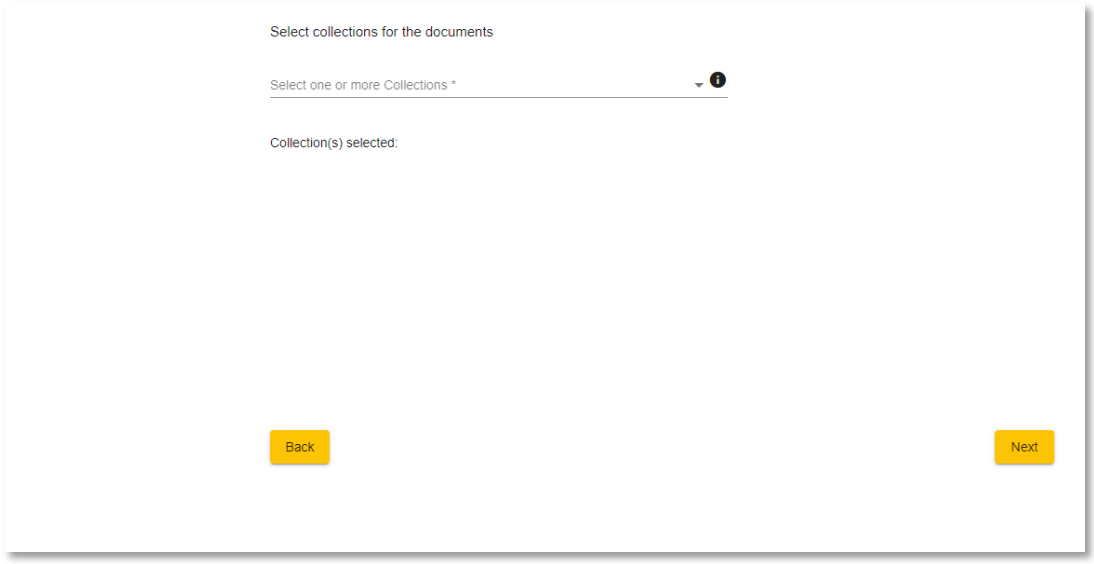


Step 1 – Select Documents

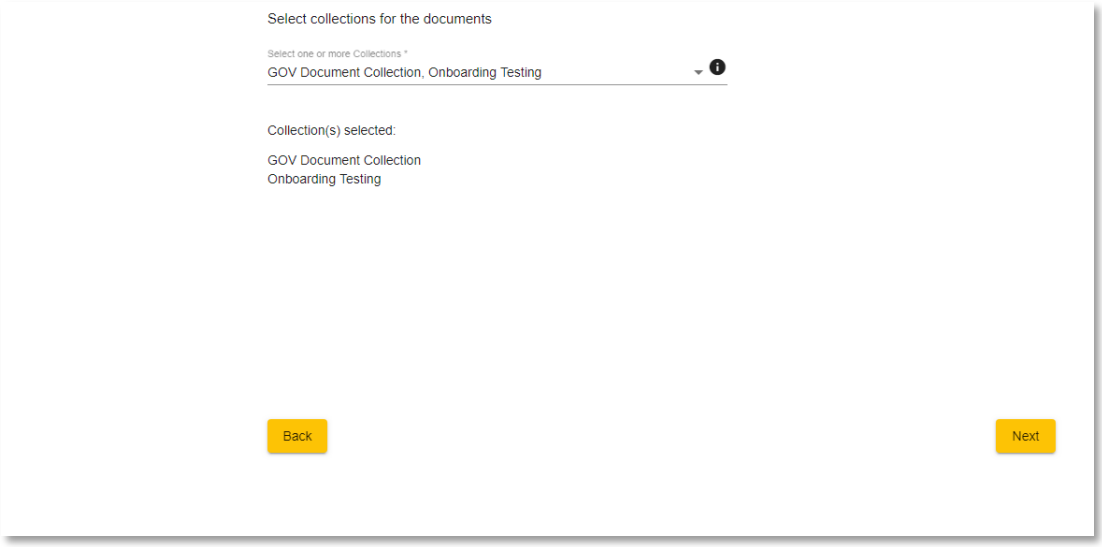


The first step “Select Documents” is shown. You may click choose File button or drag a file into the “Drop a ZIP file here” box. Additionally, enter in the required field “Agreement Id”. The Agreement Id is the license agreement under which the new Documents are provided. Enter the required field “Reason for Uploading” which is a brief description of why these documents are being added. Enter the “License Expiration Date” or check that the “License never expires” check box. If this document uploading is to overwrite previously uploaded documents, check the “Overwrite Existing Documents” check box. Unchecking “Upload As Draft(s)” will skip the draft stage and immediately publish documents into TexSpecs. Publishing documents directly requires the Onboarding and Publishing user permissions. After choosing if the document should be a draft, select the publisher the document belongs to from the dropdown. When this is complete click next or select step 2 on the top of the page.

Step 2 – Select Document Collections

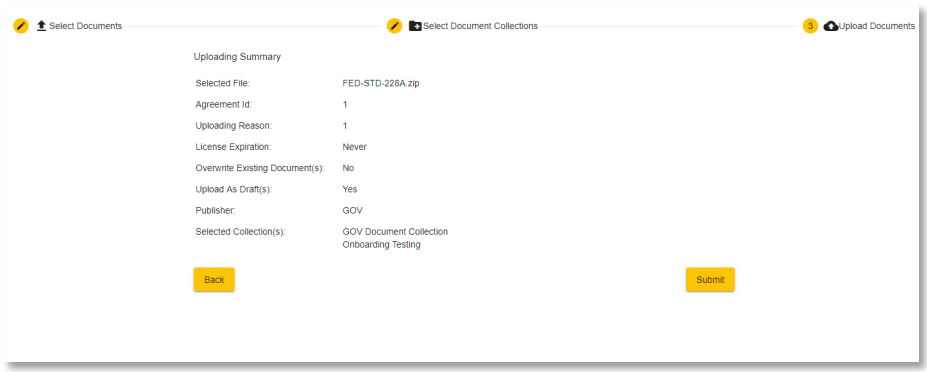


Choose the document collection(s) these documents should be added to. Document collections control what Roles users must have to view these documents.



This shows two document collections were chosen. It is possible to select one or many document collections. When this is complete go on to step 3.

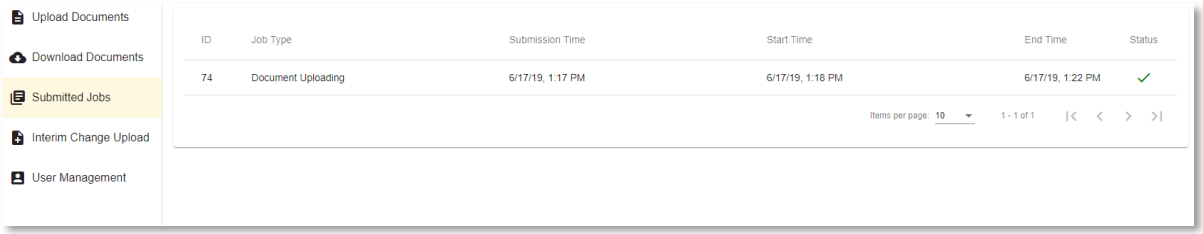
Step 3 – Upload Documents



In this step the Uploading Summary is displayed so it can be reviewed, and the user may go back and modify information before they click the submit button and start the upload. After submitting the job, the submitted job status page will open.

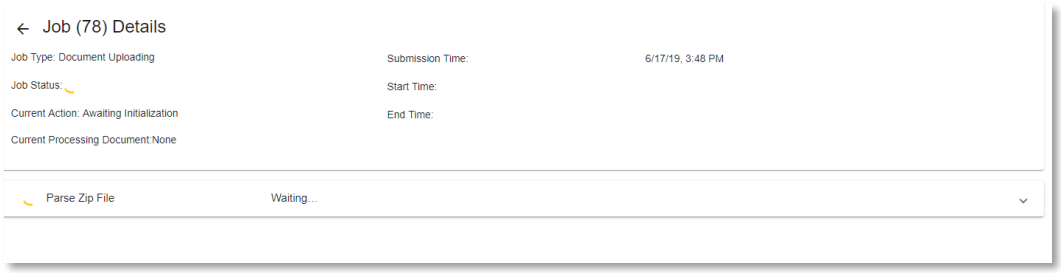
Submitted Jobs

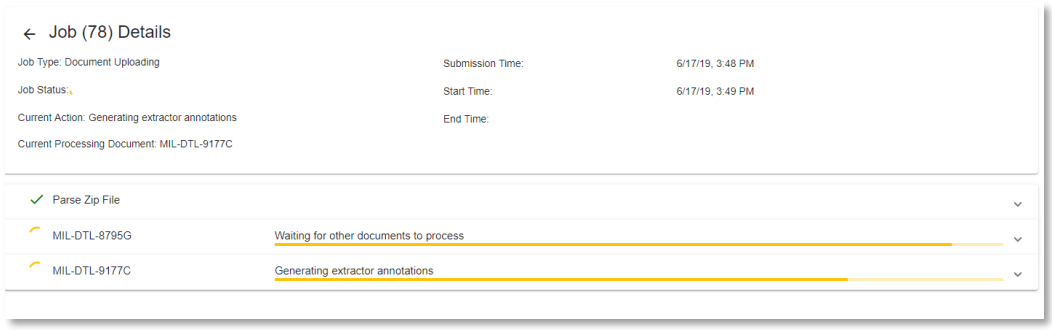
Selecting the Submitted Jobs menu item displays all upload jobs that have been submitted. The status column shows the status of the job. The refresh icon indicates the job is waiting to be processed or currently being processed. A red exclamation indicates that the job failed. The green check mark is for success. Use the controls at the bottom to navigate between pages of submitted jobs. Clicking on a job will display its status.

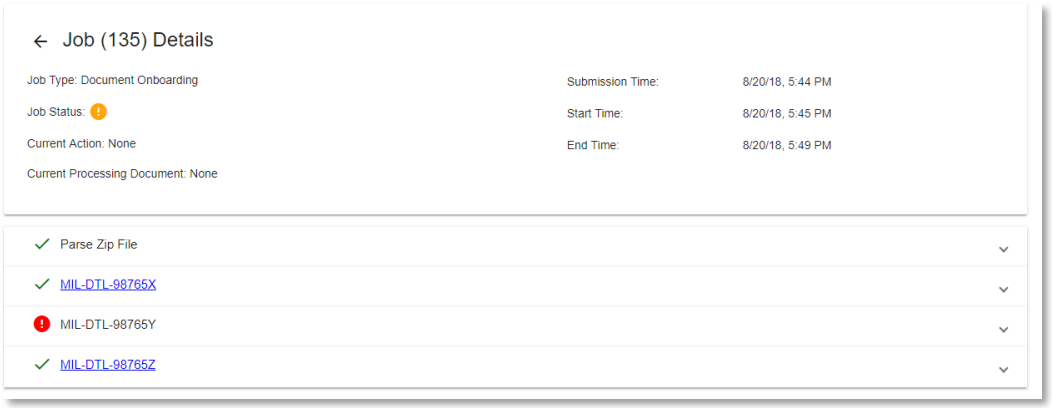


Submitted Job Status

The submitted job status page provides updates on the progress of your job. It will periodically refresh with the current status while your job is running.



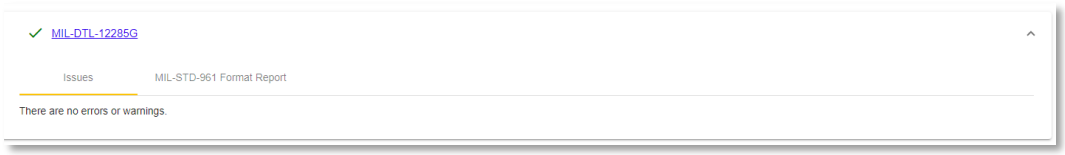




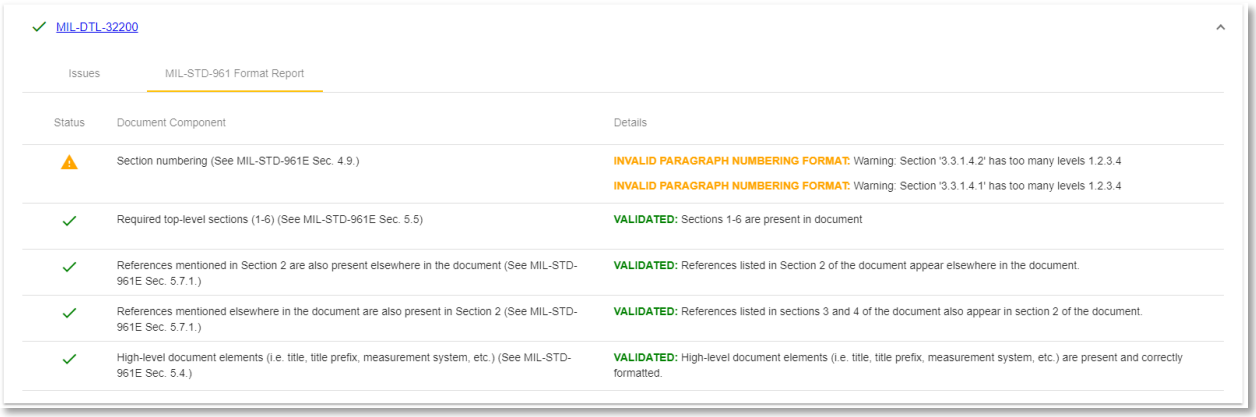
When uploading is successful, links to the uploaded documents appear. Clicking the link will take you to the document in Spectacle. Failed documents will have a red status and documents with just warnings will have an orange status. A document may have warnings, but still successfully uploaded.

Clicking on a document's row displays additional information about the upload job.

The first tab displays warnings and errors encountered while uploading the document.

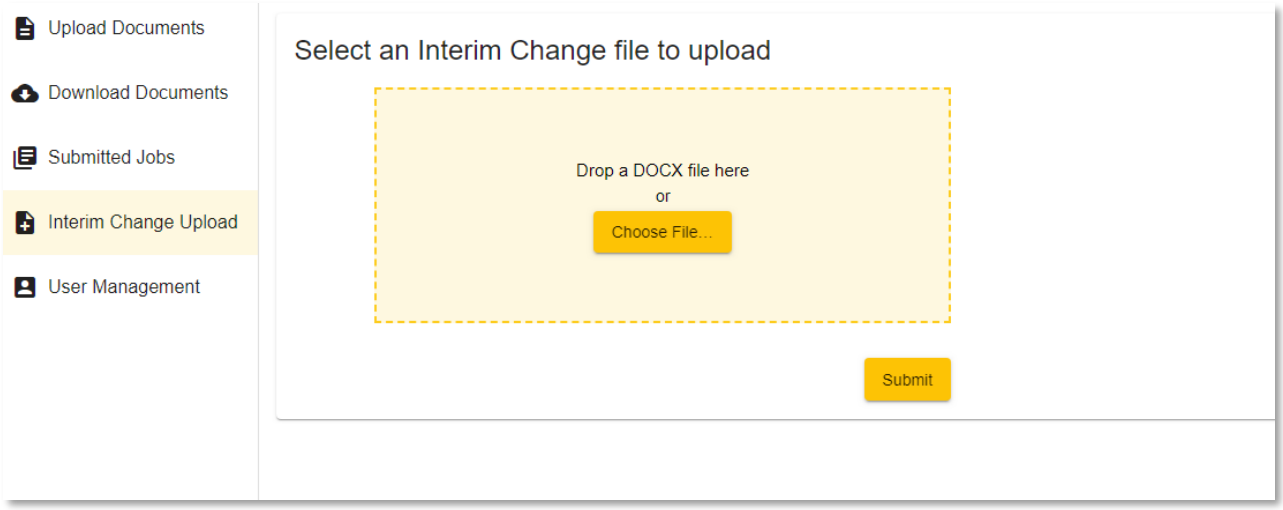


The second tab displays a MIL-STD-961 format report for the document if applicable.

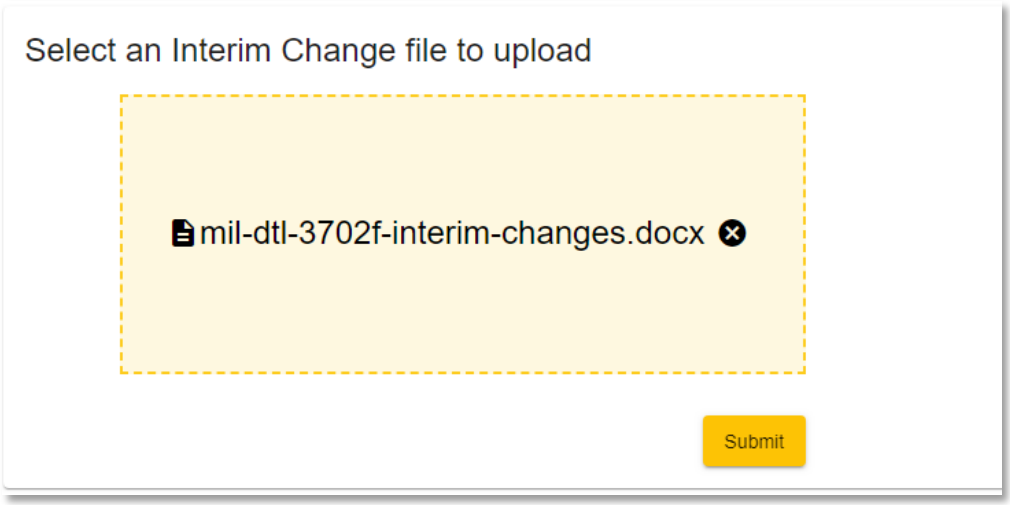


Uploading Interim Changes

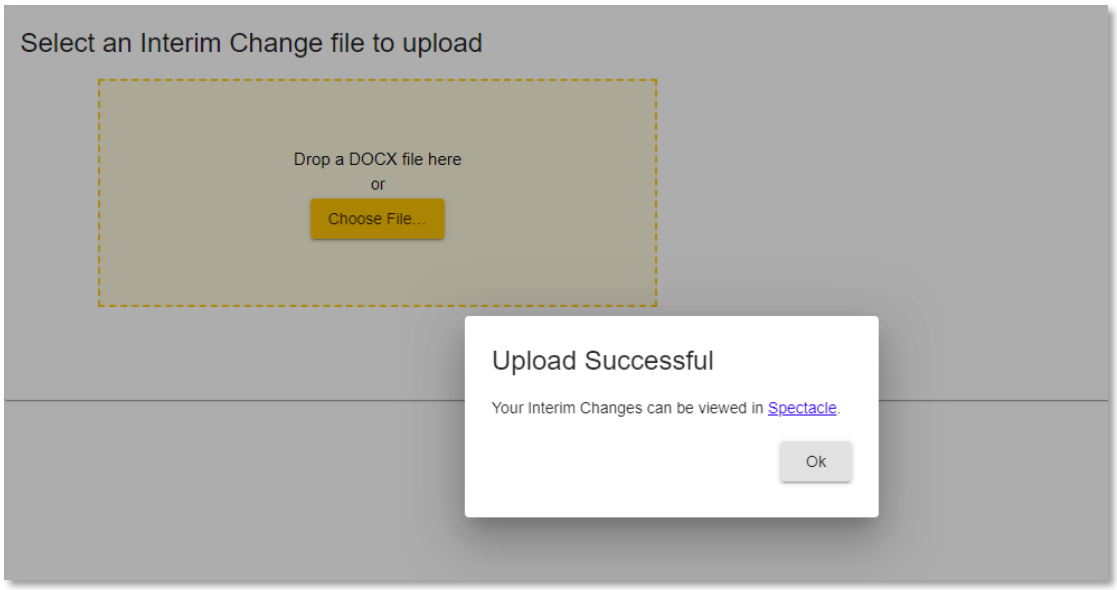
Selecting the Interim Change Upload menu item displays an upload form for user interim changes.



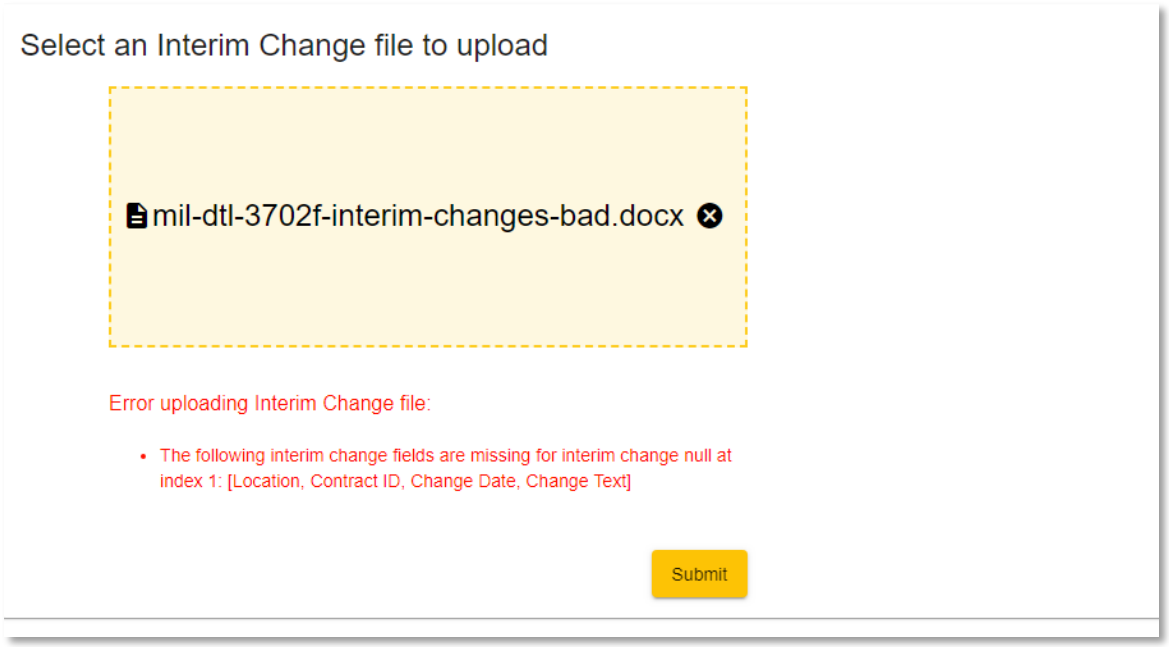
The upload accepts Interim Change files in the MS Word format. To upload your file, select your file via the Choose File button or drag and drop your MS Word file into the box. Click Submit to upload your file.



If your submission is successful, you will see a dialog box with a link to Spectacle to view your Interim Changes.

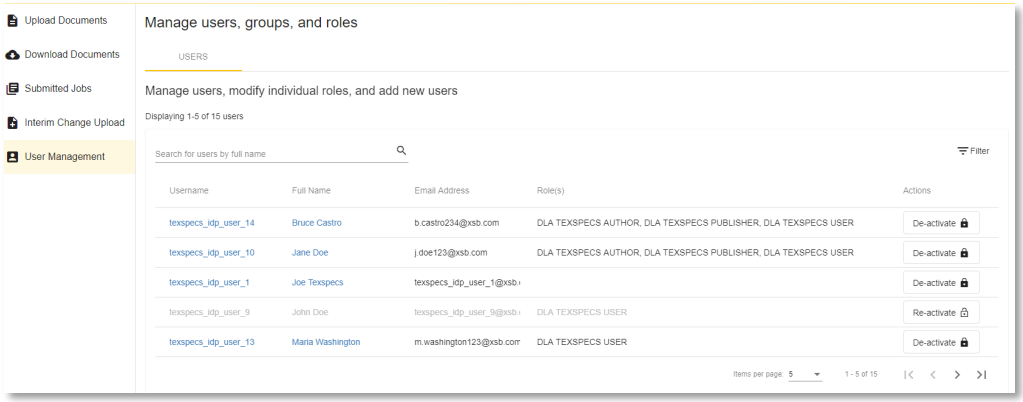


If your submission is unsuccessful, the encountered errors will display on the screen.

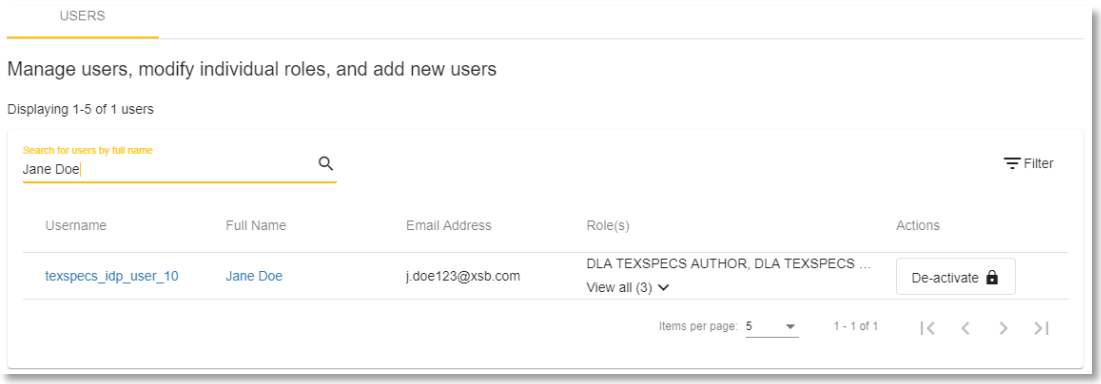


User Management

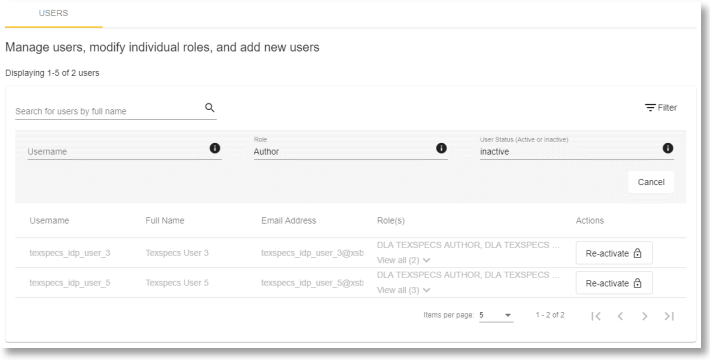
Selecting the User Management menu item displays a list of users you can manage.



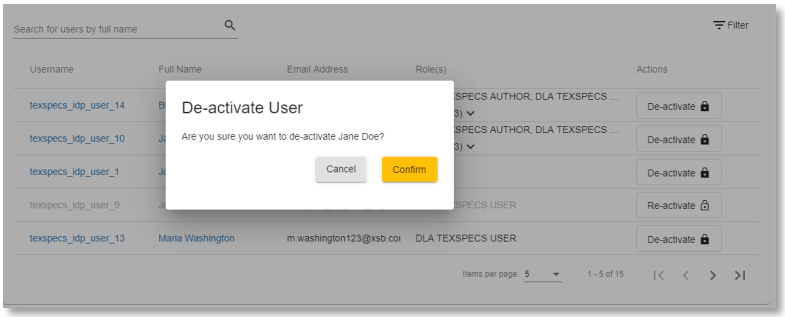
You can search for users by typing their name in the text box.



Additional filters are available by pressing the Filter button. Your filters can be cleared by pressing Cancel.

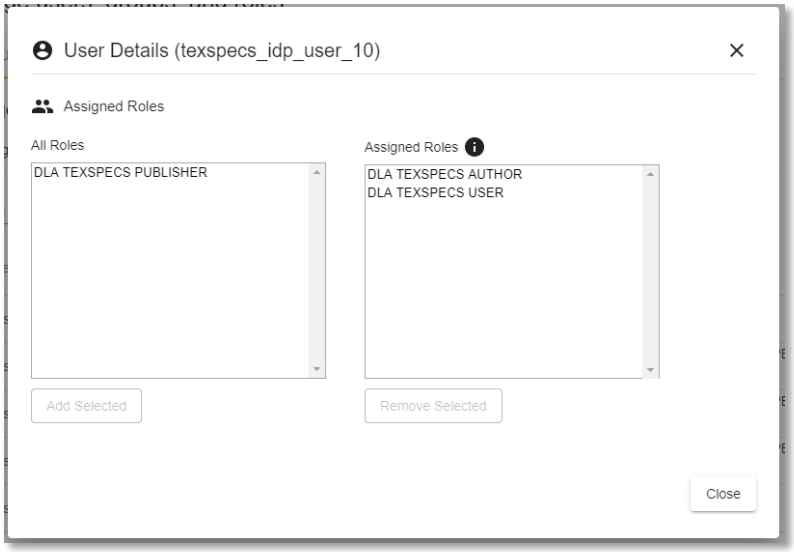


Press the button in the Actions column to de-active or re-active a user. A confirmation will display and the action will take effect once confirmed.



User Details

Click on an active user's name presents his or her details.

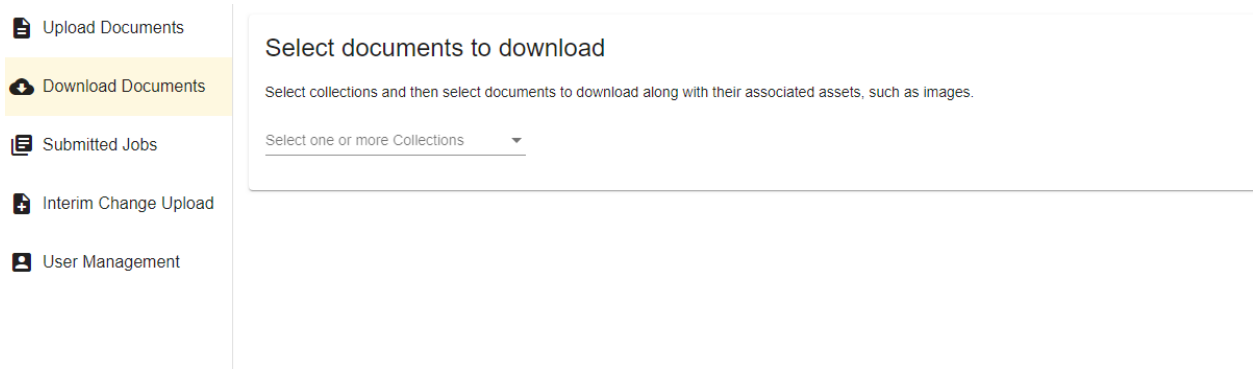


Editing User Roles

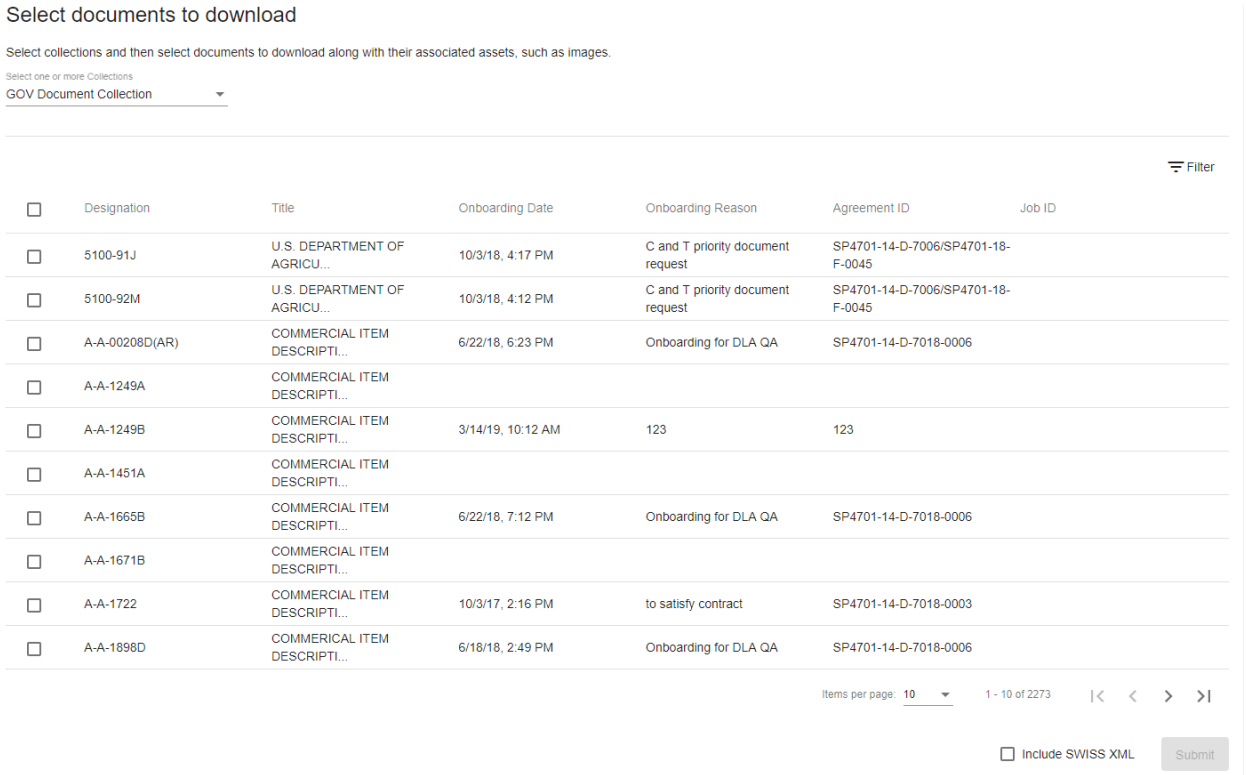
Roles can be added to the user by selecting roles in the “All Roles” list and clicking “Add Selected”. Roles can be removed by selecting roles in the “Assigned Roles” list and clicking “Remove selected”. Gray roles in the “Assigned Roles” list are roles implied by other roles and can’t be removed directly. All roles that imply a role must be removed in order to remove an implied role.

Downloading Documents

Selecting the “Download Documents” menu item displays a form for downloading documents.

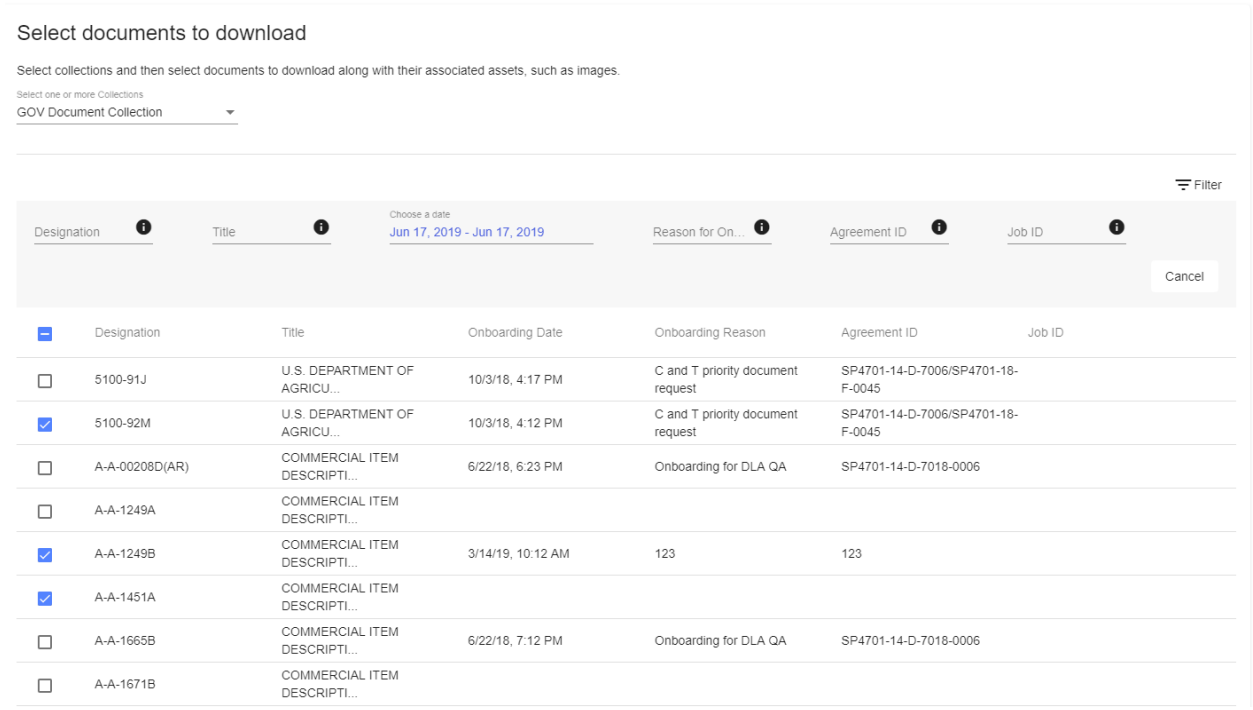


The form initially displays a dropdown containing document collections that you have access to. Select one collection, some collections or all collections, and a table will be displayed which lists the documents in those collections that you have access to.

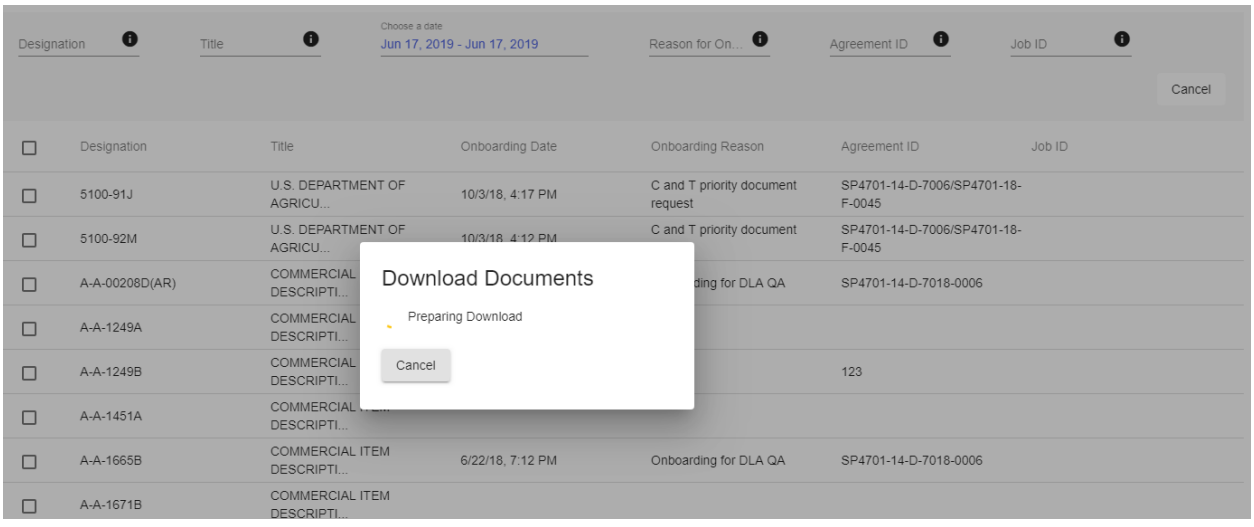


The checkboxes in the leftmost column are used to choose which documents to include in the download. The “Include SWISS XML” checkbox determines what assets will be included. If checked, then assets that were generated by TexSpecs during uploading will be included along with the originally provided documents.

Additional filters are available by pressing the Filter button. Your filters can be cleared by pressing Cancel.



Once documents have been selected, click the Submit button to prepare the download. The “Download” will be prepared and downloaded as a zip file containing your requested documents.



Formatting Best Practices for MS Word Import/Onboarding

September 2019

Best Practices

We recommend the following approaches to formatting specific elements and types:

- Section Labeling
    - Use paragraph numbers as outlined in MIL-STD-961E, section 4.9, underlining titles immediately following the section number.
        - Use consecutive numbering with subsections separated by a period.

- Manual cross reference links (Note: As of September 2019 some but not all internal cross references are added without manual tagging, as part of on-boarding.)
    - Where section, table, and figure references are present:
        - Mark the element to be linked to using Insert→Bookmark.
        - Highlight the reference text and select Insert→Link, select "Place in This Document" and select the Bookmark.
    - Where a Section header is present and formatted as a Heading style, the Bookmark step may be skipped
    - The same Bookmark can be used for multiple Link references.

- Specification Links
    - Use fully qualified specification designations whenever possible to facilitate correct linking.
        - IE : "ASTM A1234" instead of "A1234"

Supported Import Elements

The following is a list of supported elements in the MS Word import. Any special rules used to identify the element are put in a sublist under the element.

- Front Matter -
    - A standard doc ordering is expected for this information. The expected order of elements, as well as their required/optional status is:
        - Measurement System - OPTIONAL
            - The text is in a textbox at the beginning of the document, or a table cell.
            - The valid values for Measurement System are constrained to one of :
                - METRIC
                - INCH-POUND
                - NOT MEASUREMENT SENSITIVE
                - N/A
            - Note that values not precisely matching the above options may be misinterpreted as a Designation and may cause import failure.
    -

- Designation - REQUIRED
  - The letters on the end of the designation are generally detected as the revision of the document, but this may vary based on the designation format.
  - Some designation formats may be normalized by SWISS extraction processes.
  - Note that underscores in a designation will be replaced with spaces in the final format.
  - This element is typically left-justified or contained within a table cell leading the first page.
- Release Date - REQUIRED
  - Most formats are accepted and normalized by the import process, but a format of DD MONTH YYYY (IE: 20 January 1987) is preferred.
  - While generally underlined in government specification documents, this formatting is not required.
- Superseding - OPTIONAL
  - Indicates which document this document supersedes or replaces. A Superseding element consists of three parts, on individual lines. Omission of one or more parts will cause document onboarding failure.
  - Superseded revisions are preceded by the line "SUPERSEDING"
  - Superseded Designation
    - As with the Designation element above :
      - The letters on the end of the designation are generally detected as the revision of the document, but this may vary based on the designation format.
      - Some designation formats may be normalized by SWISS extraction processes.
      - Note that underscores in a designation will be replaced with spaces in the final format.
  - Release Date for superseded document
    - As with the Release Date element above :
      - Most formats are accepted and normalized by the import process, but a format of DD MONTH YYYY (IE: 20 January 1987) is preferred.
      - While generally underlined in government specification documents, this formatting is not required.
- Title - REQUIRED
  - Titles have the Title Word style.
  - The first element after the final Release Date for the document or superseding documents must be the title. No intervening text or notes will be recognized and will cause document onboarding failure.
- Subtitle - OPTIONAL

        - Subtitles have the Subtitle Word style.
        - The element immediately after the title will be recognized as a subtitle element for the document if properly formatted. If not, it will be added to the Notes section of the document below.
    - Notes - OPTIONAL
        - Additional text elements following Title and Subtitle elements will be incorporated into the front matter as Notes
        - Elements styled as a section header will terminate recognition of additional elements as Notes and will begin document body processing.
        - Notes contained within a Text Box will retain that format when onboarded.
    - Cage code - OPTIONAL
        - Text starting with "CAGE Code" within or following the initial Notes text elements, and preceding Section headers will be recognized and categorized as the Cage Code for the document
    - Additional front matter elements from First Page Footer - OPTIONAL
        - The following elements may be present in the first page footer and will be recognize as such:
        - ASMC
        -
            -
            - Text starting with the "AMSC" in the footer of the first page.
        -
        - FSC/AREA
        -
            -
            - Text starting with "FSC" or "AREA" in the footer of the first page.
        - Comments Box
            - Text within the footer of the front page will be recognized as a special comments field if it begins with "Beneficial Comments" or "Comments".
            - This text may be contained within a Text Box for clarity.
        - Distribution Statement
            - Text starting with "Distribution" in the footer of the first page.
        - Additional Notes
            - Styling rules for Notes above applies with additional text in the first page footer.
- Main Body Content
    - The following content types are supported and identifiable:
        - Sections
            - Documents are expected to be organized with content in Sections.
            - The following Section formats are supported:

        - Text with a heading optionally with numbering
        - Text sections (1. Section Title or 1.2 Subsection Title or 1.3 Subsection Title)
        - Government style subsections (1.2.3 Section Title Section text)
- Captions
    - Captions have the Caption Word style and precede OR follow graphics or tables.
        - Multi-line captions are supported, but all lines must have the Caption word style
    - Alternatively, Captions with the Caption Word style may immediately follow a graphic, separated by a "soft return" or line break, rather than placing them in a new paragraph .
        - To perform a "soft return", use the shift-enter key combination in MS Word.
    - Caption labels are extracted based on MS Word numberings (The SEQ field added when inserting a Word caption).
        - Everything before and including the numbering creates the label.
        - Everything after the numbering is put into the caption title.
- Graphics
    - Currently we only support in-line graphics. Graphics on a separate layer may be ignored or appear in odd locations in the text. It is recommended that absolutely-positioned elements not be used at this time.
- Lists
    - All MS Word list types are technically supported, but many are currently converted to standard formats. Seamless support is currently available for:
        - No leading element (simple lists)
        - Round bulleted lists
        - Upper- and Lower-case lettered lists with a period
        - Upper- and Lower-case Roman Numerals lists with a period
        - Numeric lists with a period
    - Indented, or multi-level lists are supported as well under the same parameters.
    - Support for additional MS Word default list types is in the process of being added.
- Paragraphs
    - Paragraphs as defined in MS Word will be recognized and imported as individual elements that can be referenced or transcluded individually.
- Boxed Text
    - Paragraphs with all outside borders.
    - Text boxes.

- Ref lists (i.e. from "Applicable Documents" section)
  - The following table types are specifically recognized as reference lists.
    - 2 column table with no borders.
    - 3 column table with no borders and the middle column only contains "-".
    - One or more elements with leading tabs that have :
      - A single tab separating identifier and description
        - EX : <tab>MIL-XXX-99999<tab>Specification description.
      - A tab, dash, and additional tab separating identifier and description
        - EX : <tab>MIL-XXX-99999<tab>-<tab>Specification description.
- Tables
  - Tables are supported with specific formatting for title elements as created per the process below:

    How to add title

    Select table

    Go to references Ribbon

    Click Insert Caption

    If the Table number isn't correct:

    Select the number

    Right click and select edit field (Seq should be selected) Click the Options menu and modify the formatting.

    If that isn't enough while in Edit field:

    Change the Field Name to Title and modify the title value to what you want.

  - Table elements such as row spanning cells, column spanning cells, borders, and colors (background and font) are all supported.

-
  -
- Cross-references
  - References to sections, tables, and figures are supported.
- Hyperlinks (cross-references only, not links to index entries, etc)

        - Bookmarks links to sections, tables and figures are also supported.
- Font styling
    - The following styles are supported:
        - bold
        - italic
        - underline
        - strike-through
        - subscript
        - superscript
    - Font color or highlighting is not currently supported.
    - Specific fonts or unusual character sets are not currently supported.
- Footnotes
    - Text starting with alphanumeric characters and a /. (Example: 1/ This is a footnote).
    - Footnotes occurring directly after a table will be considered table footnotes.
    - To create links to footnotes, create a bookmark in the footnote text and use hyperlinks to link to the footnote.
- Illegible Text
    - The text "[illegible text]" with a character border and a shade with a "#CCCCCC" fill.
- Non-normative Notes
    - Non-normative notes are identified as text starting with the word "note(s)" where the "s" is optional and the case doesn't matter.
        - If there is white space and a numbering after the word "note(s)" then a label will be extracted up to that number including a ":" if it appears after the numbering.
            - Example labels: Note 1, Note 2:
        - Everything after the label is included as a paragraph in the note.
    - Lists after a non-normative note are included in the note.
    - Non-normative notes after a table are included in the table-wrap-foot of the table.
- Math formulas
    - Should use Word's equation editor.
    - Labels can be added to equations by adding a "soft return" (shift+enter) after the equation and typing your label.
- Where list
    - Adding "Where:" (the ":" is optional) before a list will create a where list.
- Custodian Table
    - The first cell of a custodian table must contain one of the following keywords:
        - activities
        - activity

        - agent
        - civil agencies
        - custodian
        - industry associations
        - project
    - The rest of the table may contain anything.
- Floating or absolutely positioned elements are not currently supported.
- Word Art is not supported at this time.

TEX-290 Student Training Notes

Clothing and Textile Specification Modernization Training

February 5, 2019

Performing Organization:

XSB, Inc.

21 Bennetts Road- Suite 100

Setauket, NY 11733

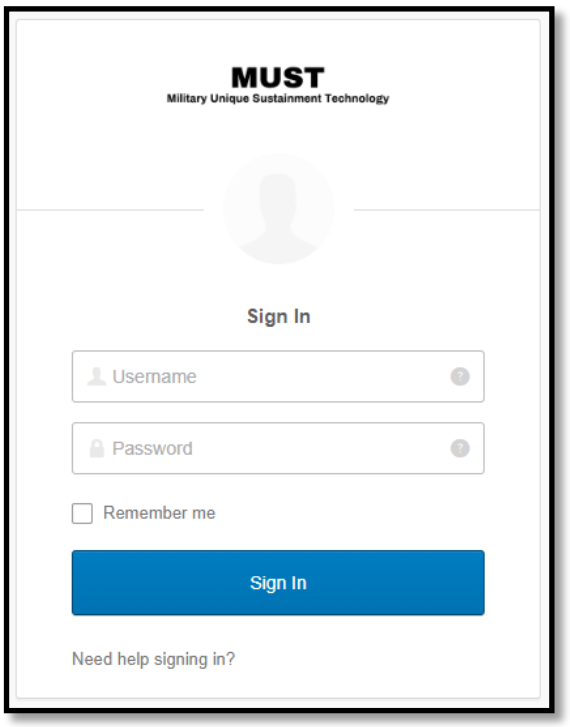
UNCLASSIFIED

Table of Contents

1 Log into TexSpecs

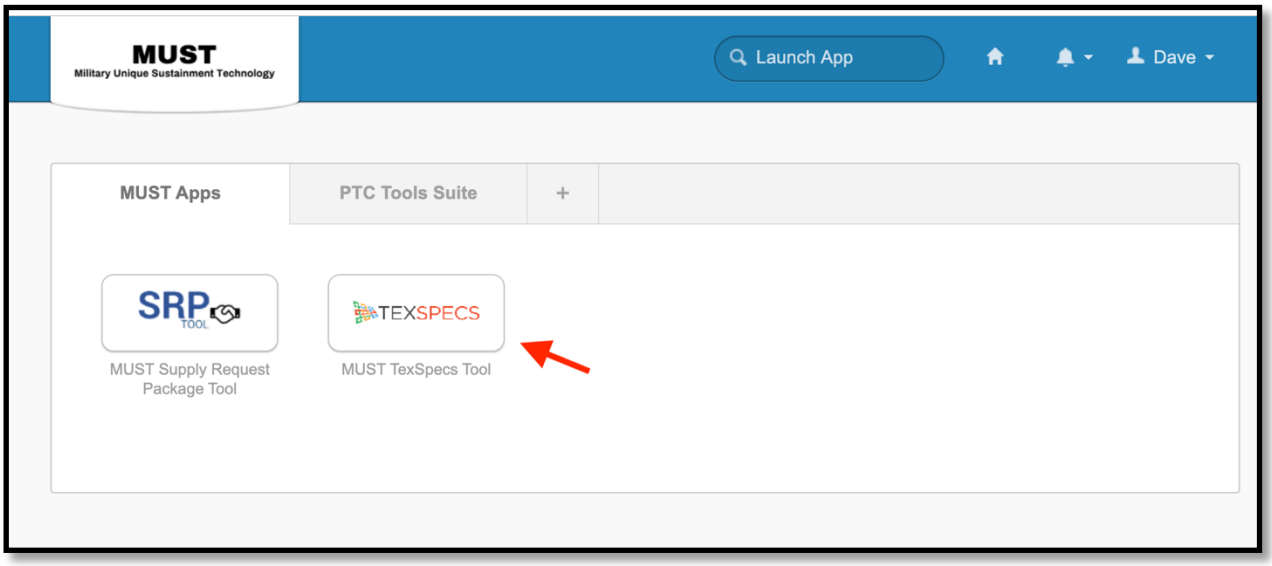
1.1 Single Sign-On Login

Login to the MUST Prototype tool at https://mustprototype.okta.com



1.2 Load TexSpecs

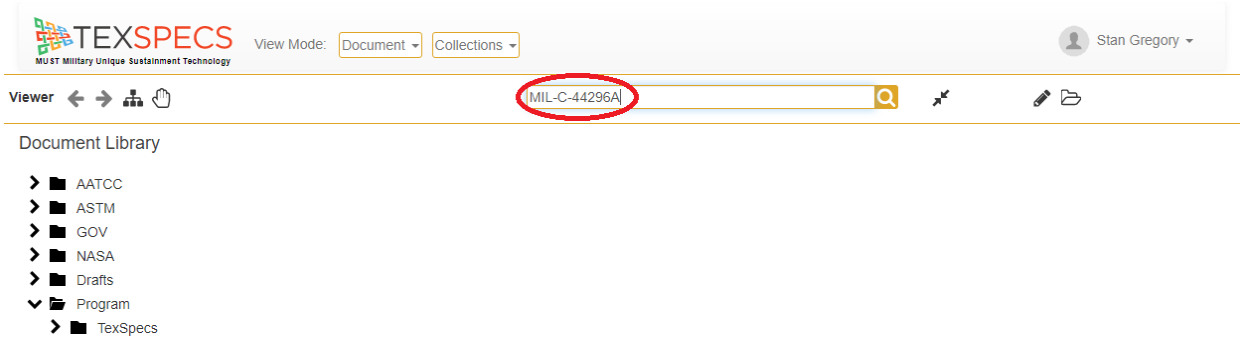
Select the link for MUST TexSpecs Tool on the MUST Prototype page to navigate to TexSpecs.



2 Load Document and Interim Changes

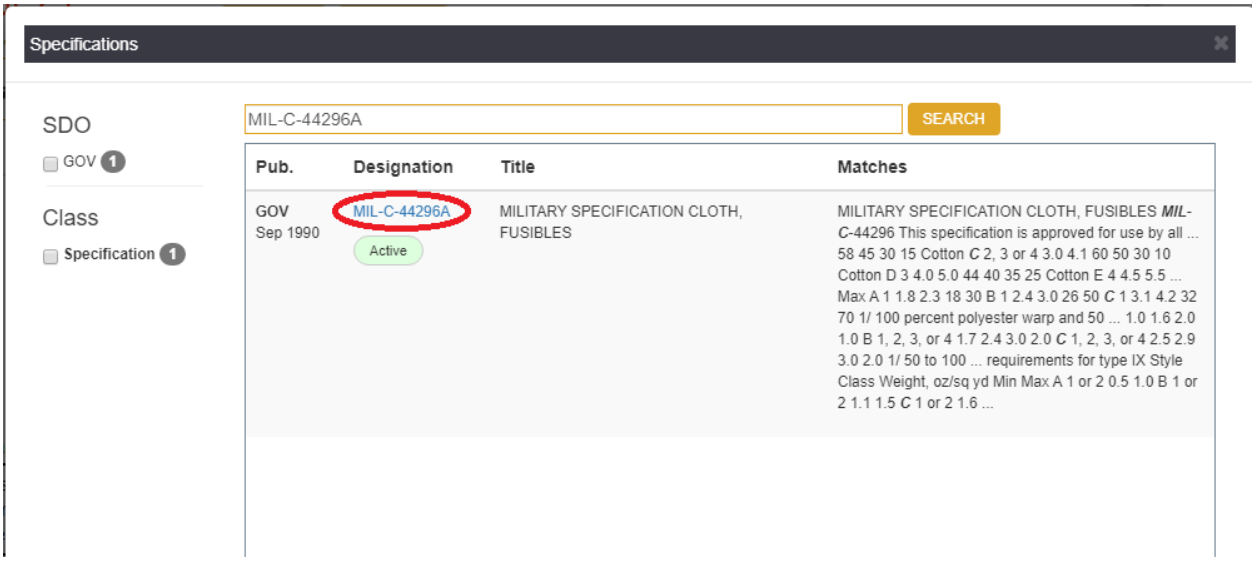
2.1 Search for Document

In TexSpecs search for the document to integrate changes into. This can be done by typing the document ID into the search box and pressing ENTER or clicking the "magnifying glass" icon. For this example, we will search for “MIL-C-44296A”.



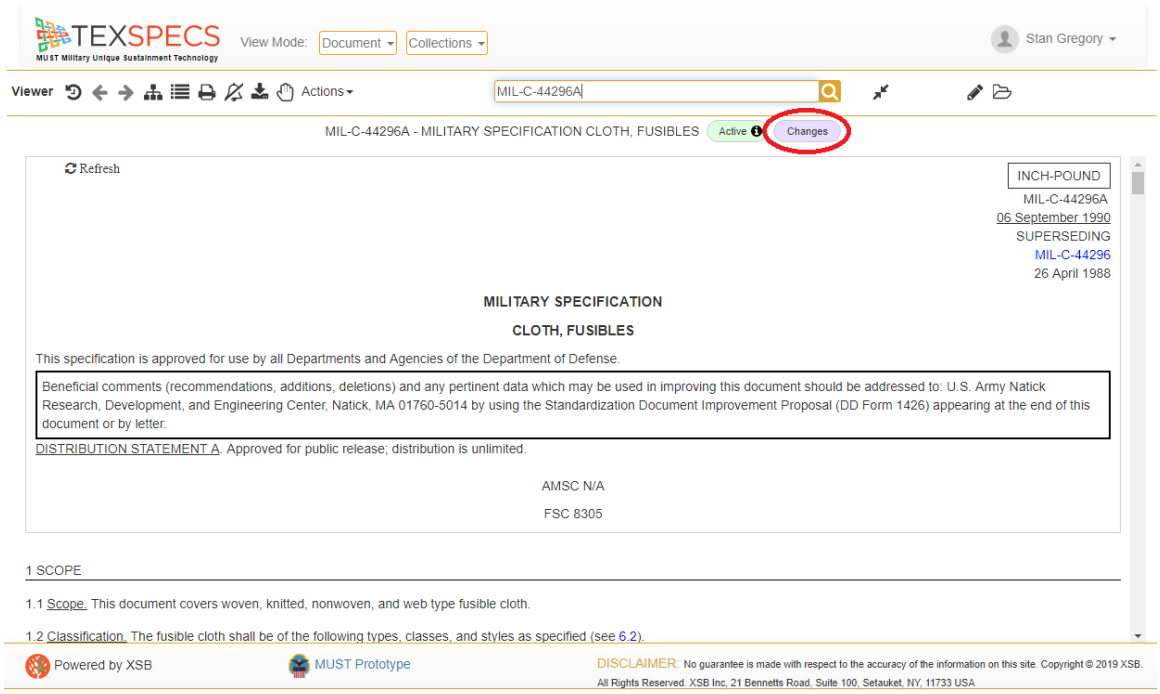
2.2 Load Document

Select the document from the search results and click on the designation link to load it.

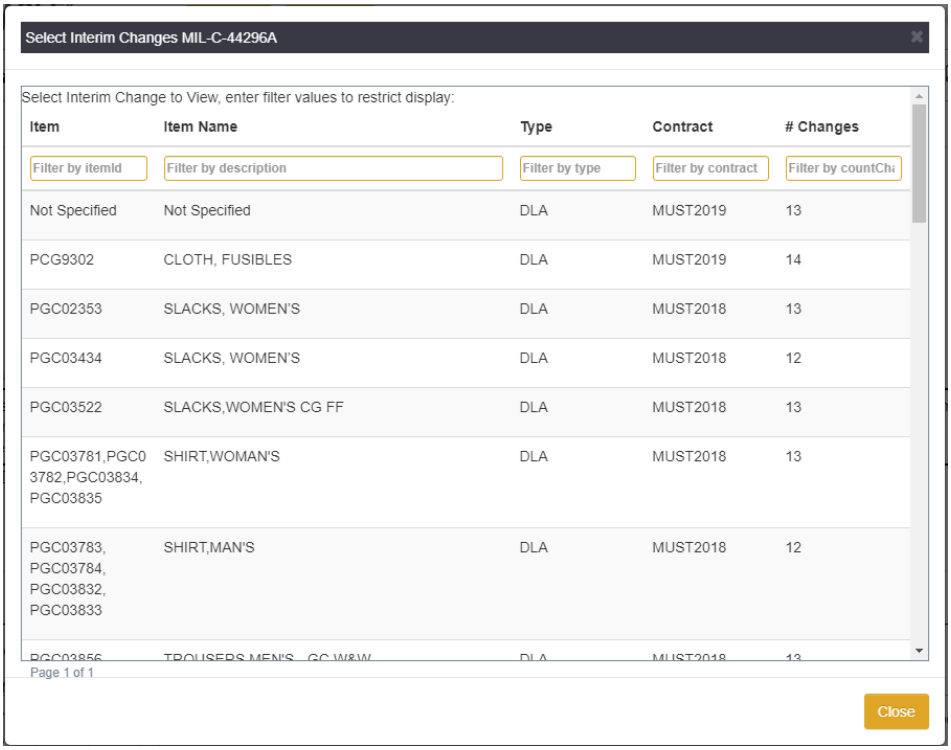


2.3 View Interim Changes Associated with Loaded Document

Once the document is loaded, click the “Changes” chip:



which will bring-up the interim changes dialog:



2.4 Load Interim Change

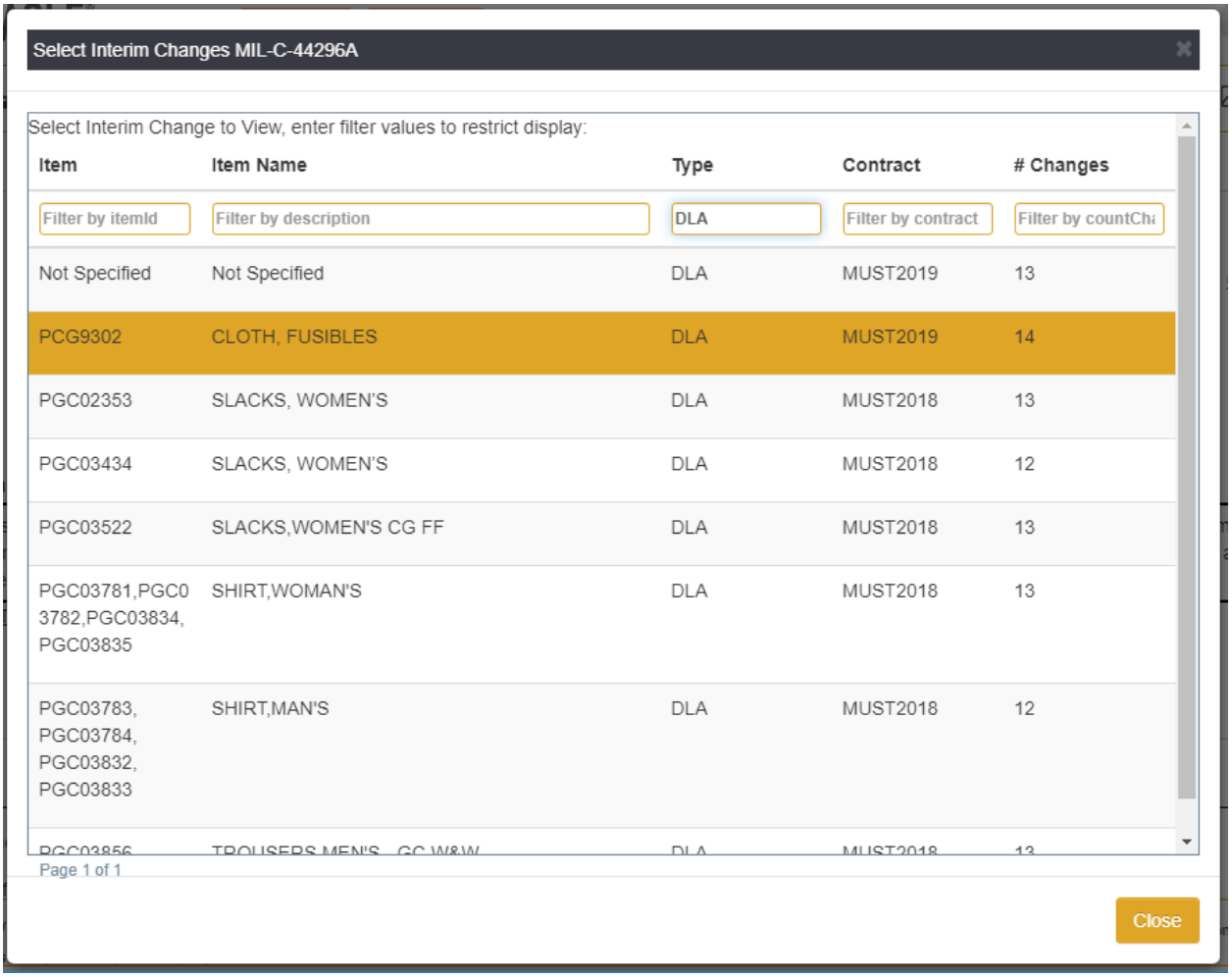
There are three types of interim changes that may appear: DLA, User, and EFOIA. The different types of interim changes are as follows:

- DLA: Interim changes supplied by C&T for the C&T documents.
- User: Only visible to the user that added the change.
- EFOIA: From public sources, available to everyone.

For document modernization, we want to use the "DLA" type. The interim change list can be filtered to show only these by typing "DLA" in the "Filter by type" box.

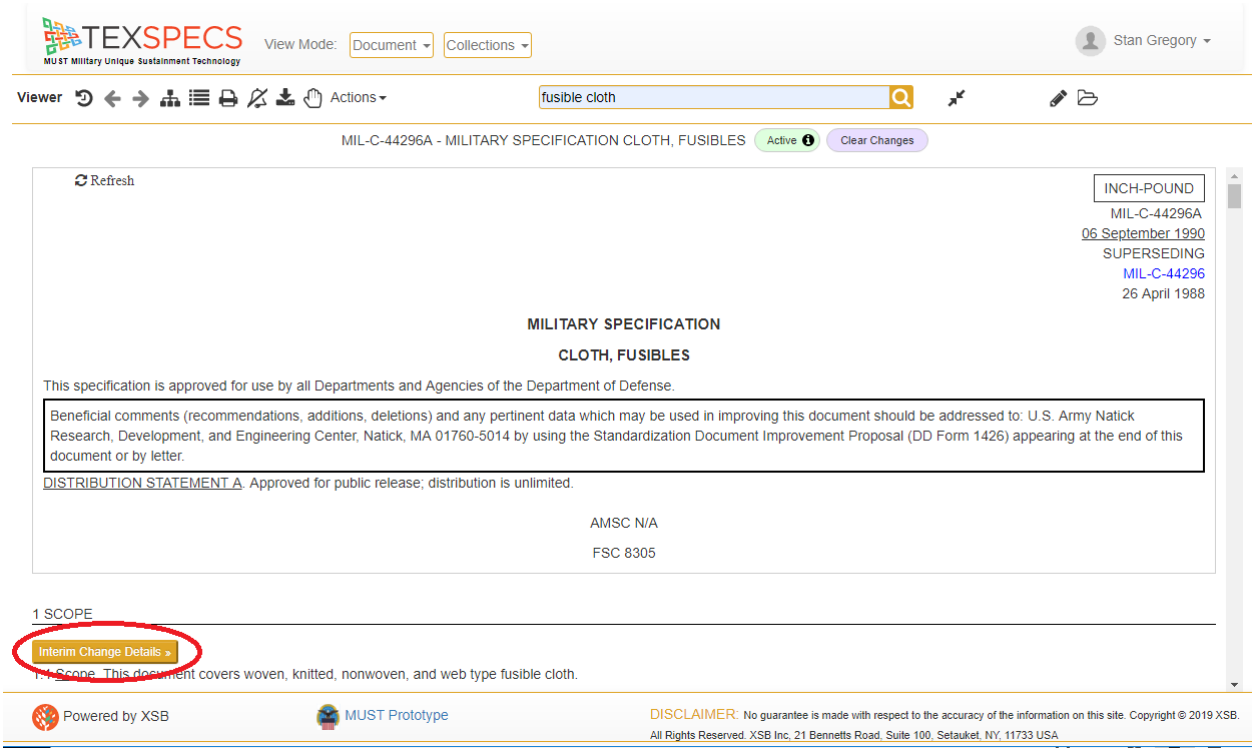
Select a set of interim changes to apply to the document by clicking on the corresponding row.

It is up to the product specialist to choose the appropriate IC when modernizing a specification. For this example select the interim change highlighted below (for PGC9302):



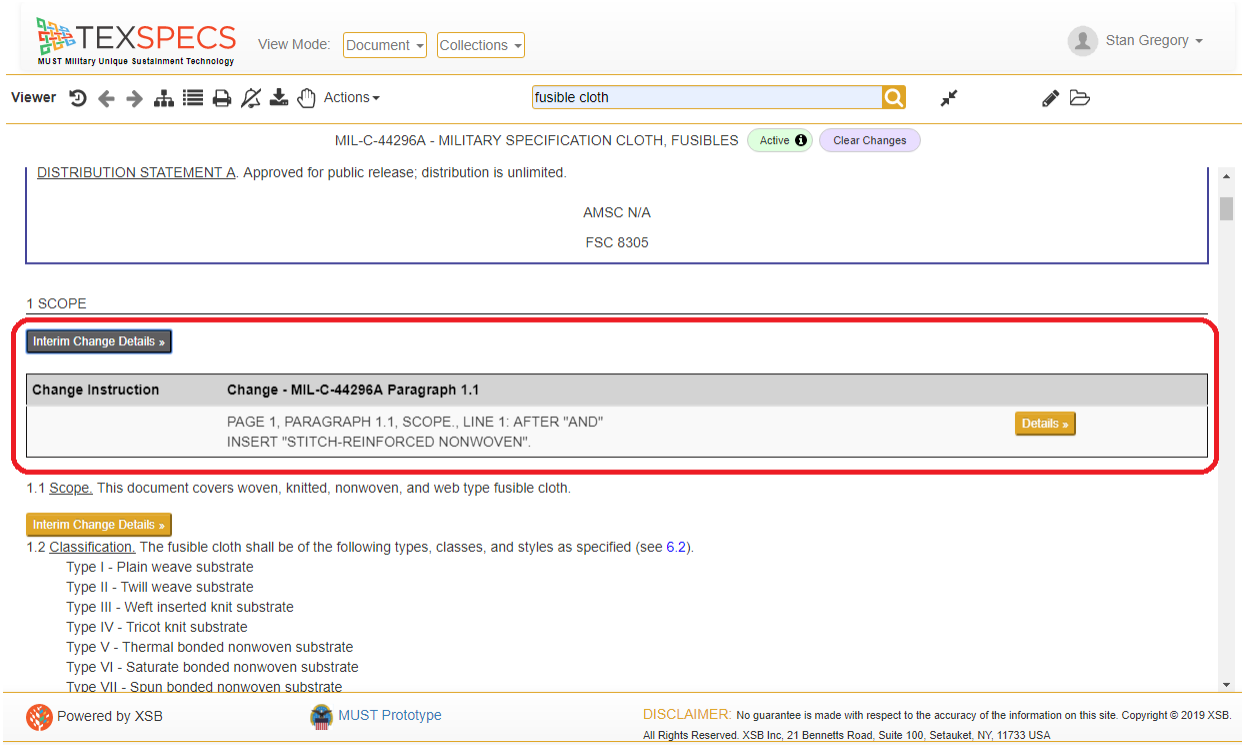
2.5 View Interim Changes

Once the changes are selected, they will show up as yellow buttons (labeled “Interim Change Details”) next to the relevant document element, with one button per interim change. You may need to scroll the document to see these interim change buttons.



2.6 View Interim Change Details

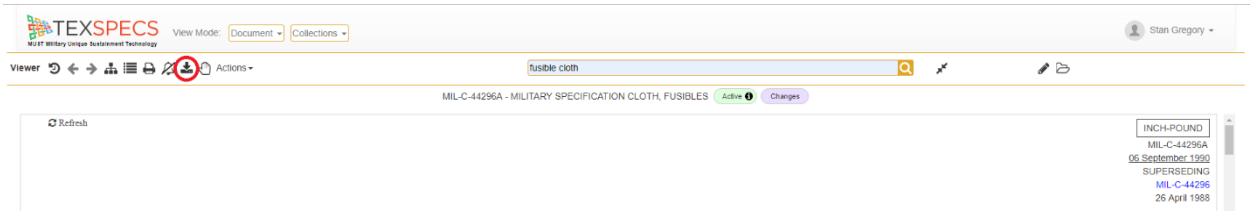
Clicking these interim change buttons will open a box containing the change information (see circled below).



3 Export the Interim Changes with the Document

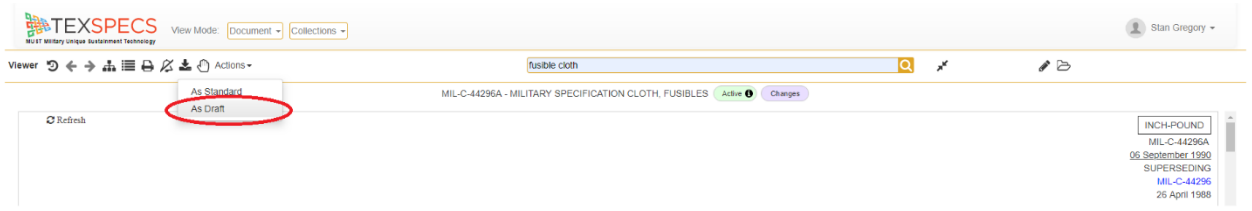
3.1 Export Document with Interim Changes

After loading interim change data to the document (as done in the previous steps), export the document to MS Word using the export button:



Choose "As Standard" for the download until you know you are exporting the final version of the document:

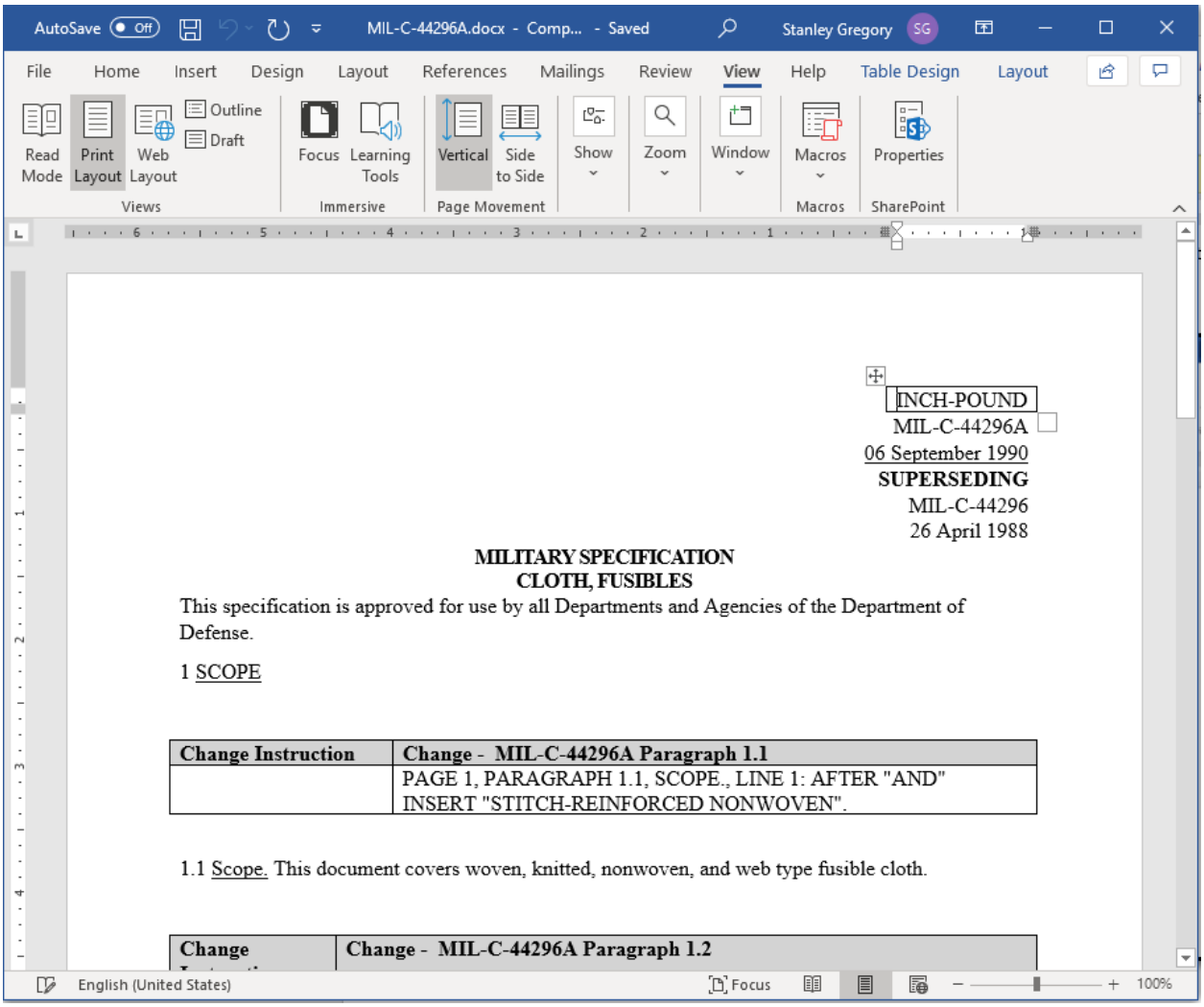
For the *final* version (once you verified that all interim changes have been applied correctly, and all MIL-STD-961 issues have been addressed) chose “As Draft” to insert the Draft notice at the beginning of the document:



4 Integrate the Interim Changes with the Document

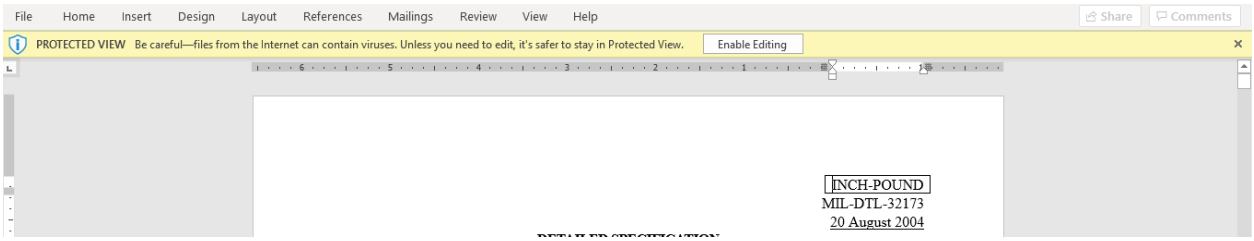
4.1 Open Exported MS Word Document

Open the document that was exported from TexSpecs.



4.2 Enable Document Editing if in Read-Only Mode

You may need to click the “Enable Editing” button before making changes, when first opening the exported document in MS Word:

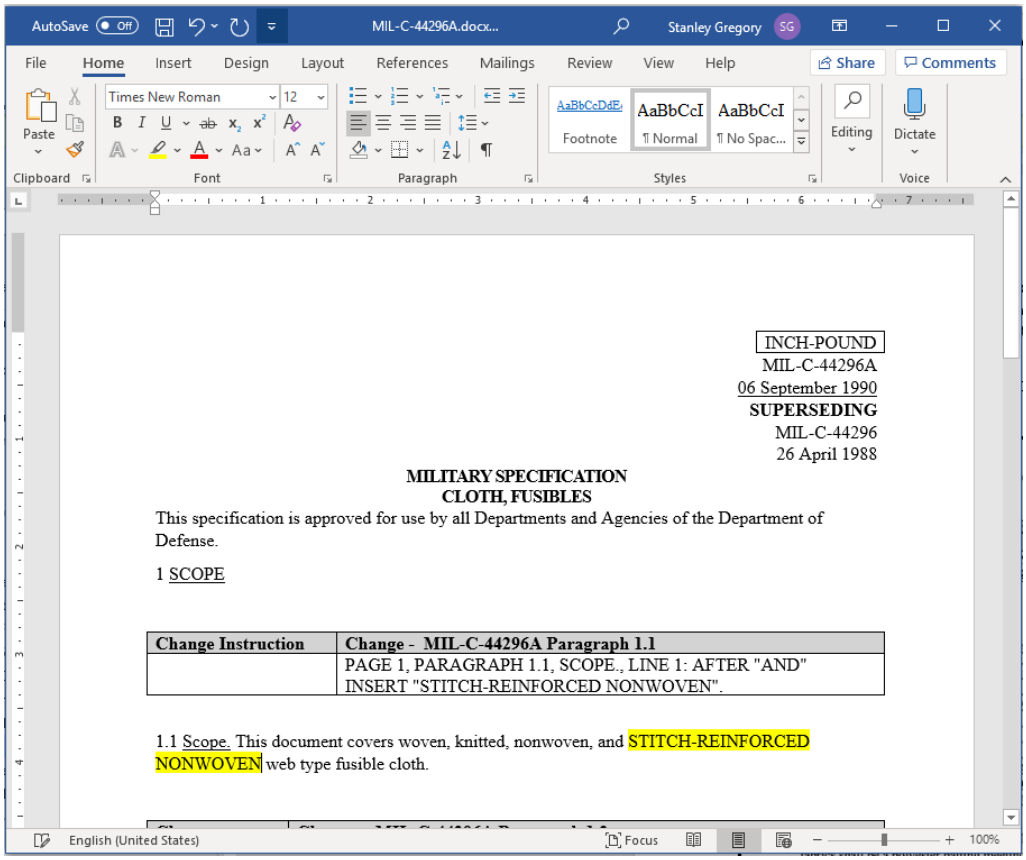


4.3 Integrate Interim Changes

Integrate the interim changes that were added to the document that was exported from TexSpecs. Scroll through the document to each section with a change (the change will be shown in a table with a grey background under its header, adjacent to the related document element), and make the required changes.

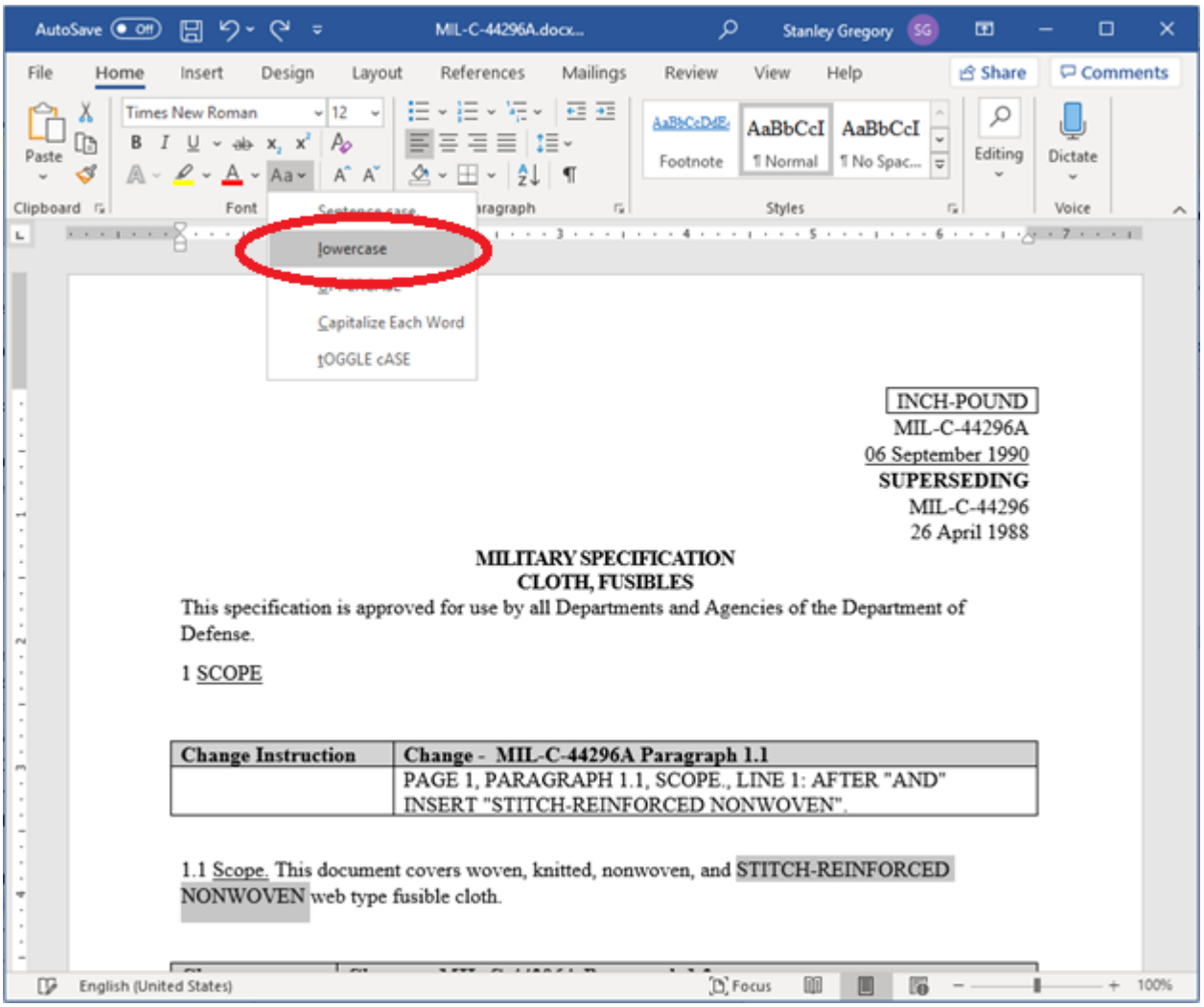
4.3.1 Make Change

In this example, scroll to section 1.1. Note that the change text is telling us to insert “STITCH-REINFORCED NONWOVEN” after the “AND” in section 1.1. First, we will insert that text (note highlighted text) below:



4.3.2 Correct Capitalization, if Needed

Correct the capitalization of the inserted text (interim changes are often given as all uppercase). If appropriate, this can be done manually or by selecting the text, then using the Change Case functionality (circled below) in MS Word:



4.3.3 Remove Non-Integrated Interim Change

To delete the non-integrated interim change table, place you mouse pointer over the interim change table and note the icon that appears next to the upper-left corner of the table (circled in red below):

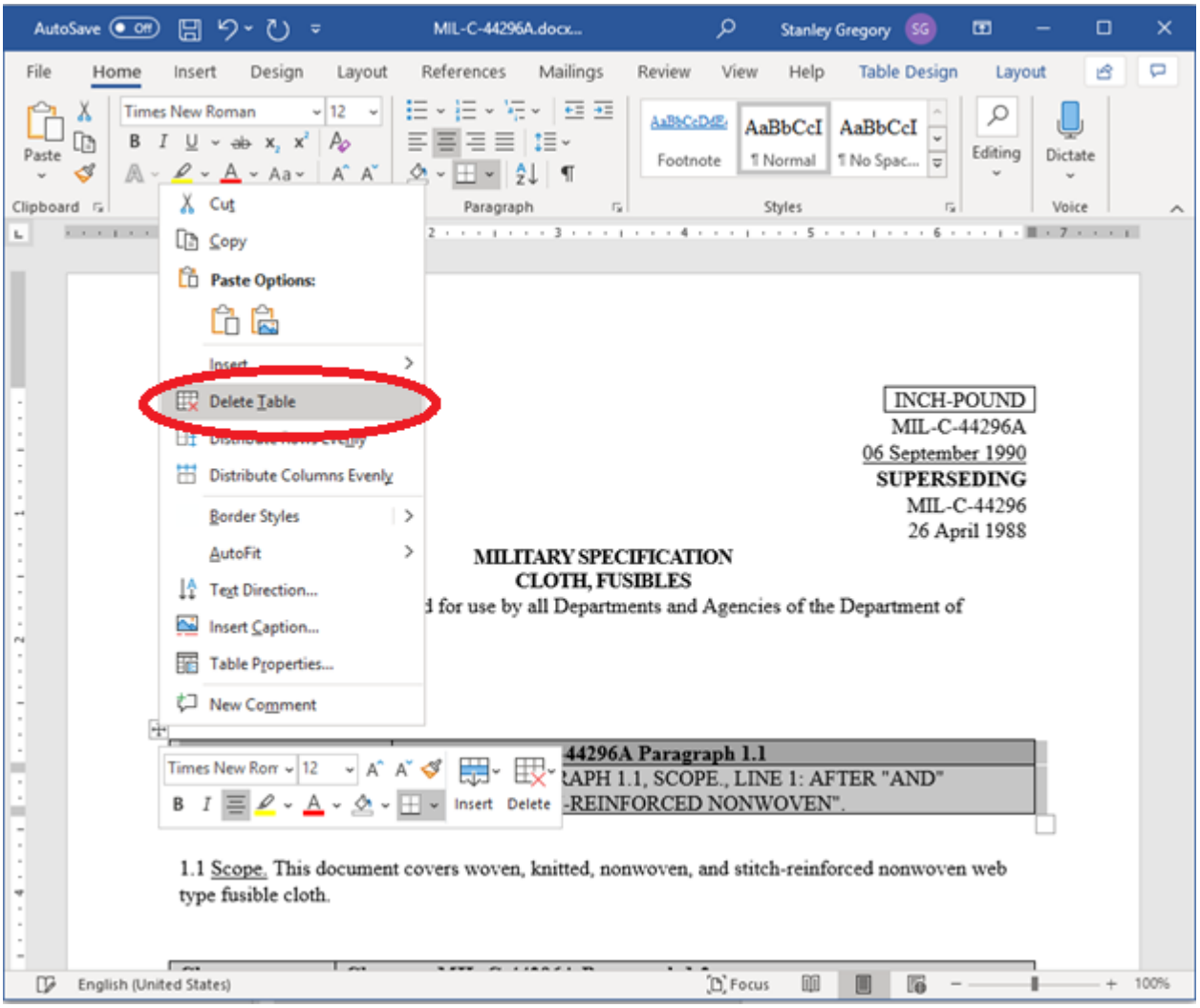
Defense.

1 SCOPE

Change Instruction	Change - MIL-C-44296A Paragraph 1.1
	PAGE 1, PARAGRAPH 1.1, SCOPE., LINE 1: AFTER "AND" INSERT "STITCH-REINFORCED NONWOVEN".

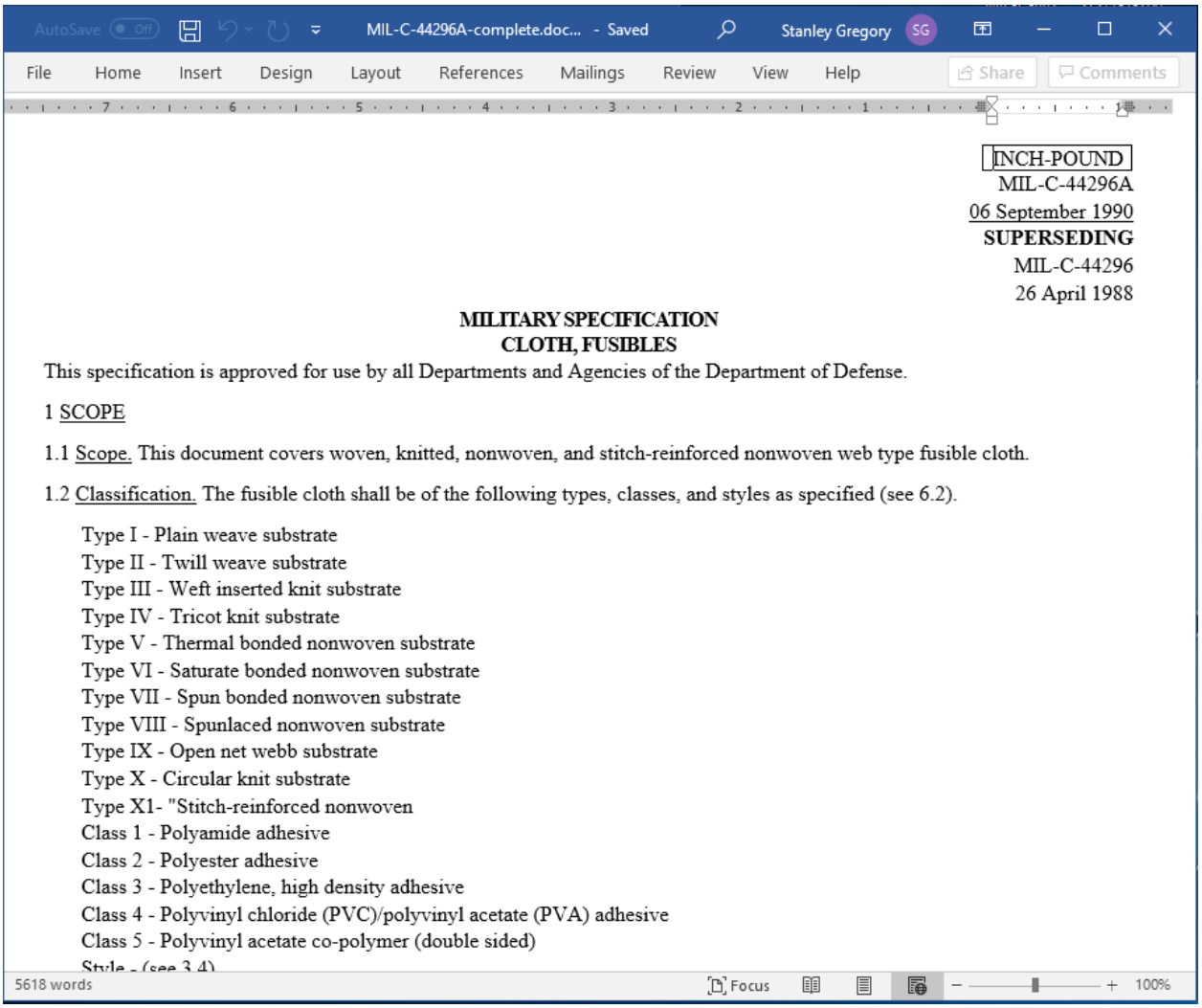
1.1 Scope. This document covers woven, knitted, nonwoven, and stitch-reinforced nonwoven web type fusible cloth.

Then right click on the icon and choose "Delete Table":



4.4 Repeat for all other Interim Changes

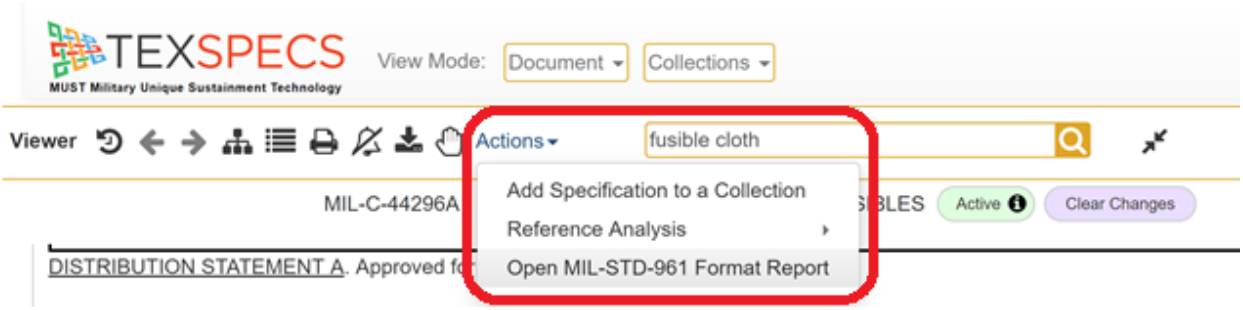
Similar actions should be taken for other changes throughout the document. If a change involves removing a paragraph, then following paragraphs may need to be renumbered. This is a manual process by the product specialist editing the document.



5 MIL-STD-961E Format Report

MIL-STD-961 is a specification which details the content and structure for U.S. Government standards documents. When viewing a document in TexSpecs, you may view the MIL-STD-961 format report to see how closely the current document adheres to a subset of requirements from the MIL-STD-961 standard. TexSpecs makes the MIL-STD-961 Format report available for MIL-DTL, MIL-PRF, and MIL-(single letter) documents. It is not available for CIDs.

Click Actions -> Open MIL-STD-961E Format Report.



As of 11/2019, the following MIL-STD-961E items are checked:

- Flag suspect phrases (MIL-STD-961E Paragraph 4.6.6 k, l, & m)
- Paragraph numbering - Checks for consecutive numbering and number of levels (4.9)
- Check paragraph heading (existence and format) (4.10)
- Check table numbering (4.13.1)
- Check figure numbering (4.14.1)
- Check for references to cancelled specs (4.19.b)
- Check for erroneous internal (figure/table/section) references (4.19.d)
- Check for DID references (4.19.f)
- Document number - Checks for valid document designation (5.4.1)
- Date - Checks for valid document date (5.4.2)
- Measurement system - Checks for valid field (5.4.3)
- Supersedes date – Check that superseded document date is earlier than current document date (5.4.4) (note - this is not strictly a 961 requirement, just a sanity check)
- Heading - Checks for "DETAIL SPECIFICATION" or "PERFORMANCE SPECIFICATION" (5.4.5)
- Preamble - Checks for valid preamble (5.4.8)
- FSC/FSG - Checks for presence of value (5.4.10)
- AMSC - Checks for presence of value (5.4.11)
- Sectional arrangement - Checks for existence of Sections 1-6, checks section titles (5.5)
- Listing of applicable documents - Checks that documents listed in Section 2 appear in section 3 or 4; checks that documents referenced in sections 3 and 4 appear in Section 2. (5.7.1)

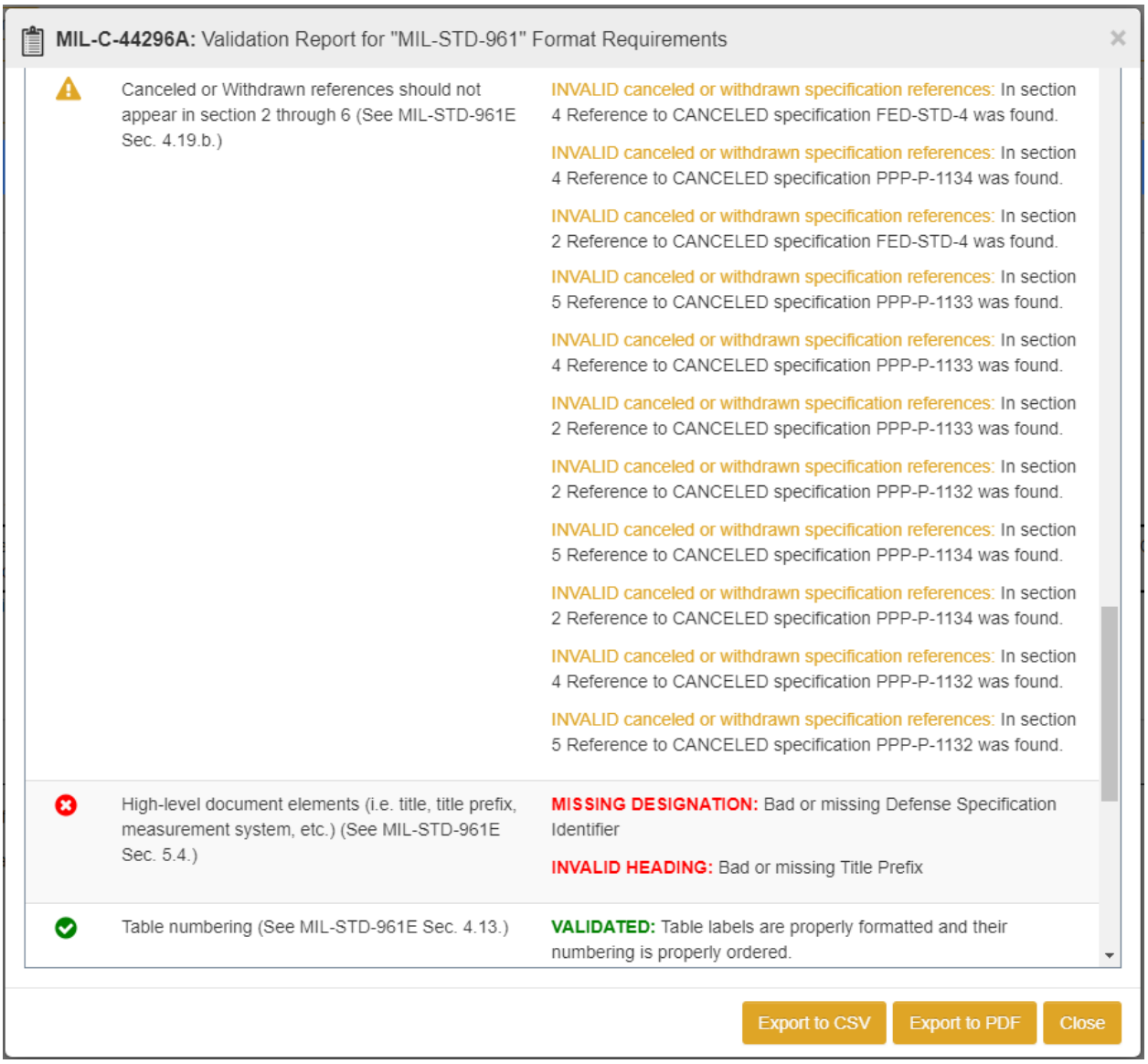
You will need to perform the checks not listed above manually.

5.1 View MIL-STD-961 Format Report

The MIL-STD-961E Format Report will open a dialog showing the results of the report.

There are three types of results returned:

- Green check box (no issues found): The document passed this part of the test.
- Yellow exclamation points (warning): Issues found that MIL-STD-961E indicates should be avoided, but are not outright not-permitted.
- Red X (error): Issues that are not permitted by MIL-STD-961E.



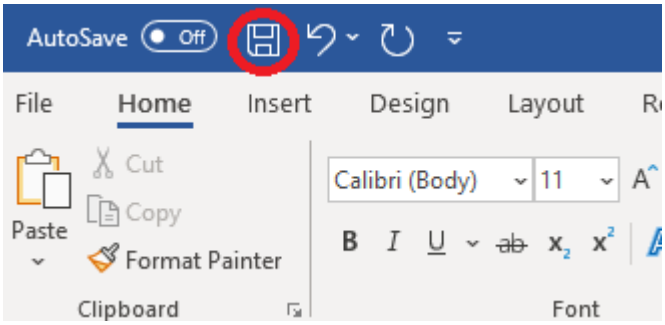
Then click “Export to PDF” to save the report for reference while correcting the document in MS Word.

5.2 Make the MIL-STD-961E Corrections

Review the MIL-STD-961E PDF that you exported earlier (or simply go back into TexSpecs and view it again) to go through the list of errors, making corrections for the errors and warnings to your exported MS Word document.

5.3 Save the MS Word Document

When finished processing all the changes, save the word document, by clicking the circled icon.

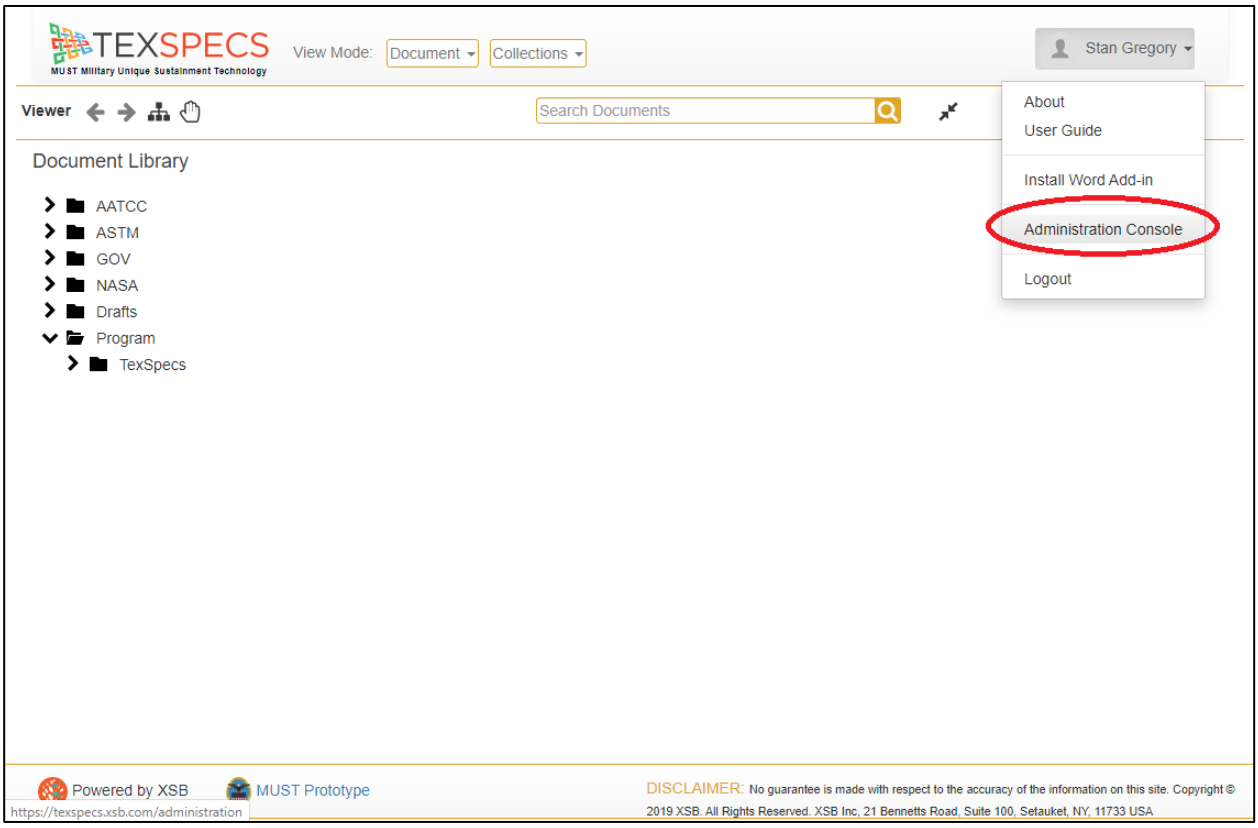


6 Import New Document as “Draft”

You should now import the new version of the document that you have made as a “draft” into TexSpecs. This will allow you to re-run the MIL-STD-961 compliance check to verify that all issues have been addresses and that the document does not have any obsolete references in it.

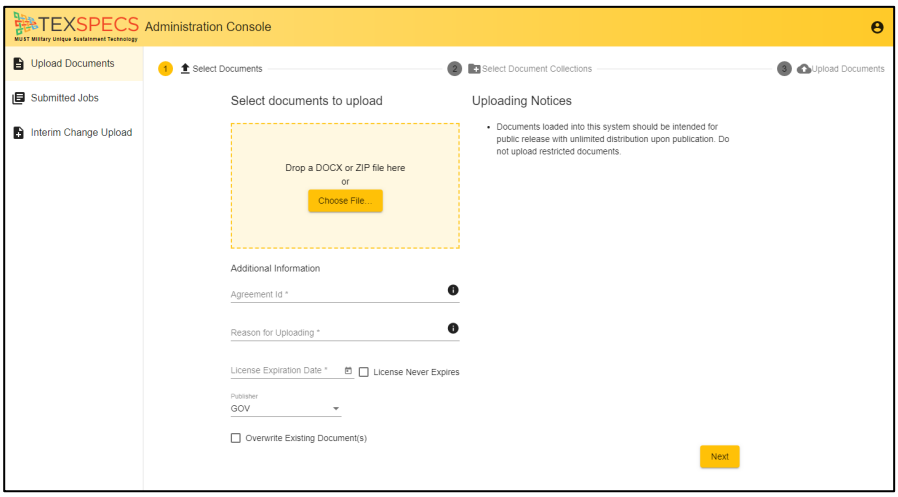
6.1 Open the Administration Console

Click on you name in the upper right of the screen and select “Administration Console” to open the application we will be using to import the “draft” document back into TexSpecs:



6.2 Import New DOCX Document – Select File and Settings

You should see a screen allowing you to import files into TexSpecs:



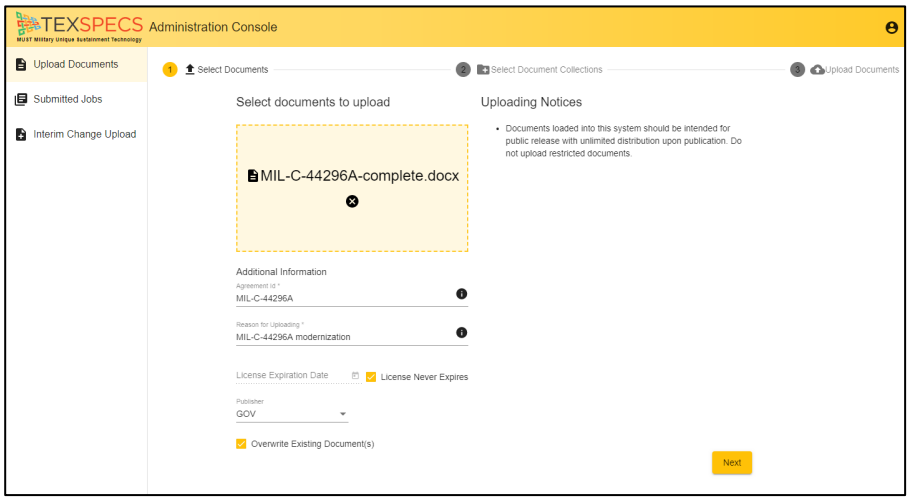
Drag-and-drop the DOCX file that you have edited onto the peach-colored box on the screen.

Fill-in the “Agreement ID,” “Reason for Onboarding” fields. You can simply enter the designator of the document.

Select the “License Never Expires” checkbox, and choose “GOV” for the “Publisher.”

If you see a checkbox to upload the document as a draft (depends on your permissions in TexSpecs), make sure that it is checked.

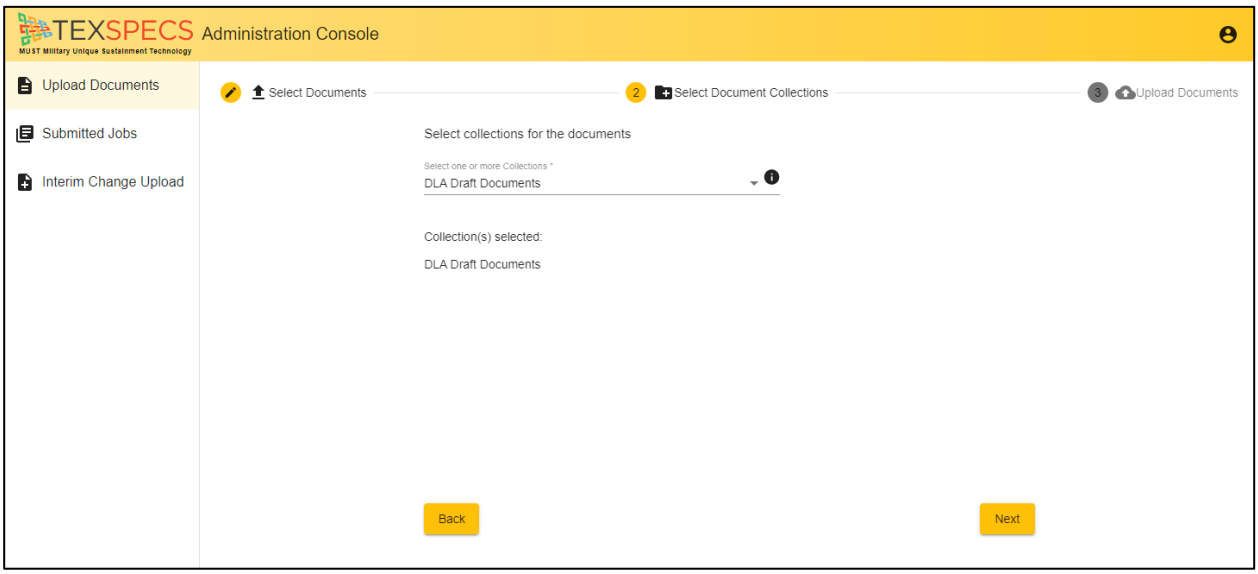
The “Overwrite Existing Document(s)” checkbox is a safety feature. If this revision of the document you are uploading should not be in TexSpecs already, let it unchecked If you are trying to overwrite a previous upload of this revision of the document, select the checkbox.



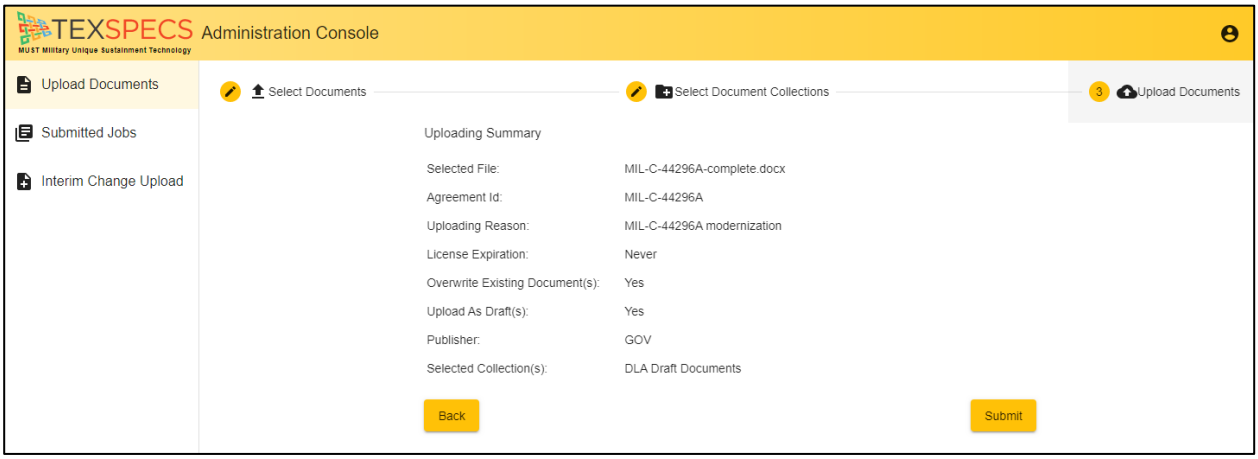
Click “Next” at the lower-right of the screen (you may need to scroll down to see it).

6.3 Import New DOCX Document – Choose Users that can see the Document

Select the "DLA Draft Documents" collection to load your document into:



6.4 Import New DOCX Document – Upload the Document



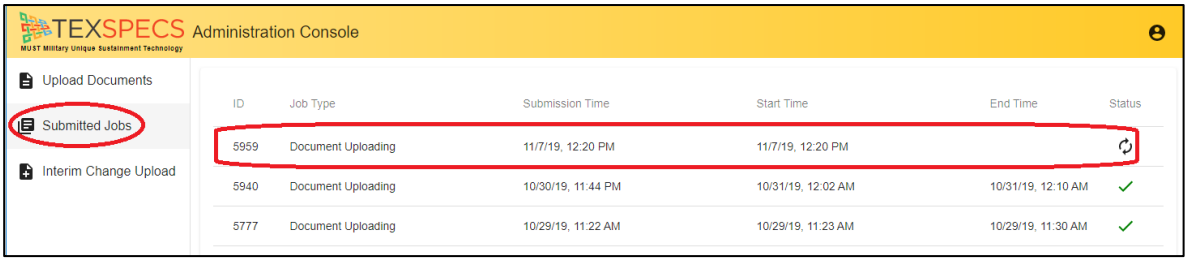
In this step the Uploading Summary is displayed so it can be reviewed, and the user may go back and modify information before they click the submit button and start the upload. After submitting the job, the submitted job status page will open.

6.5 Viewing Uploaded "Draft" Document Progress

Selecting the Submitted Jobs menu item on the left of the screen (circled below) displays all upload jobs that have been submitted. The status column shows the status of the job:

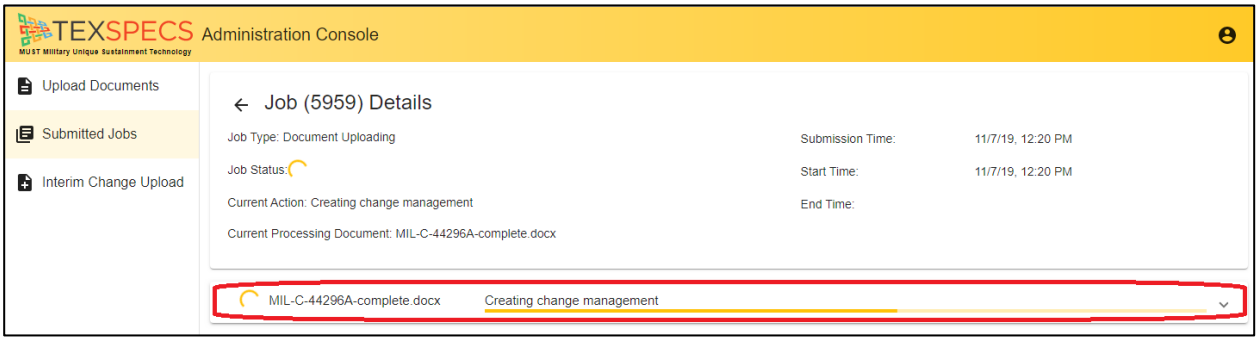
- The refresh icon (two arrows in a circle) indicates the job is waiting to be processed or currently being processed.
- The green check mark indicates success.
- A red exclamation indicates that the job failed.

The highlighted row shows the upload that you just performed (circled below).



Click the line for the document that you submitted.

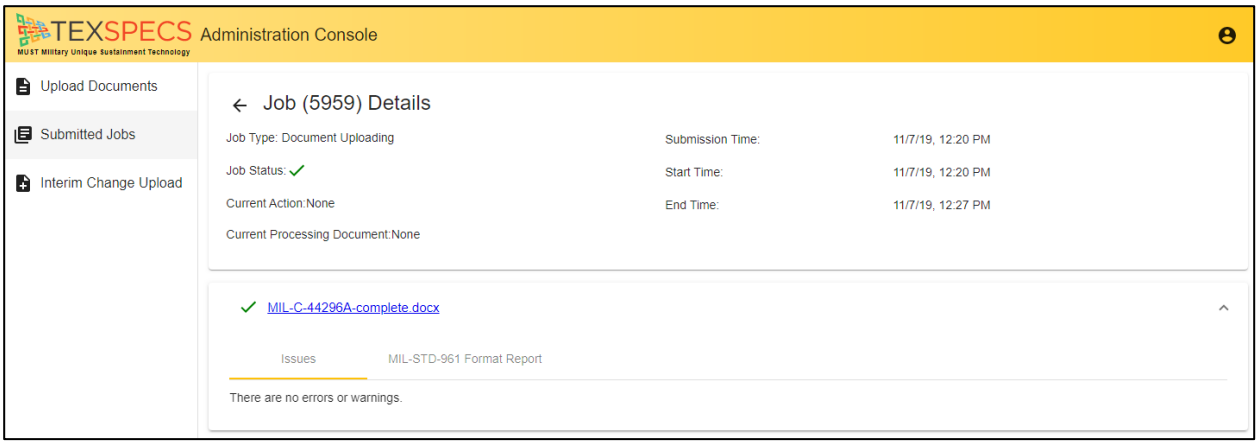
The submitted job status page provides updates on the progress of your job. It will periodically refresh with the current status while your job is running. Clicking the line showing the onboarding status will show you more detailed information. Click the line for your document (circled below):



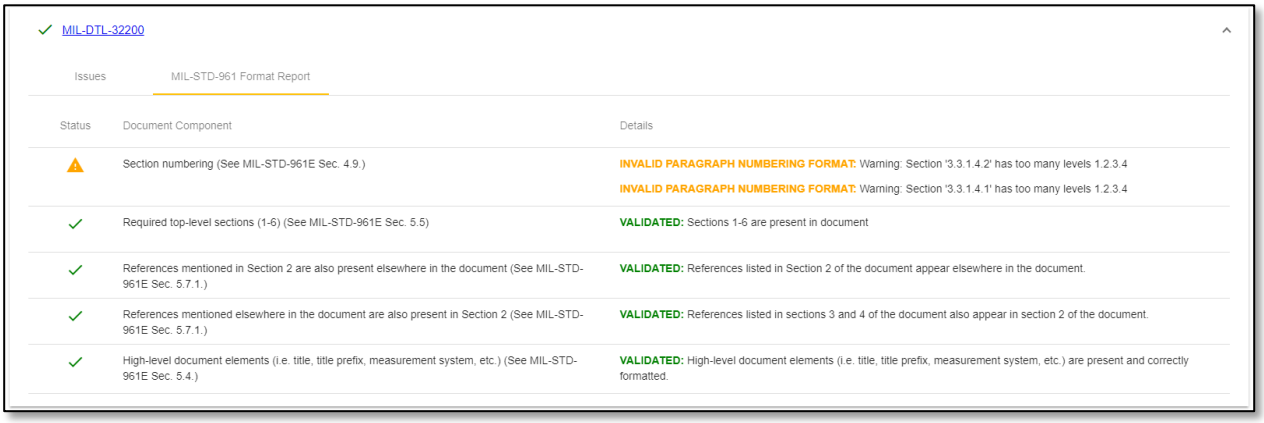
When uploading is successful, links to the uploaded document(s) appear.

Failed documents will have a red status and documents with just warnings will have an orange status. A document may have warnings, but still successfully uploaded.

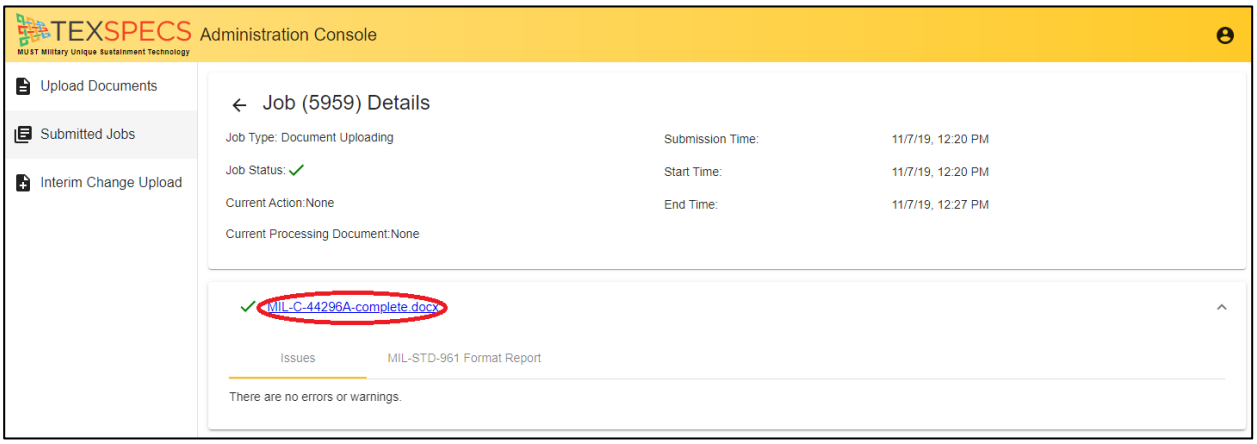
The first tab displays warnings and errors encountered while uploading the document.



The second tab displays a MIL-STD-961 format report for the document if applicable.

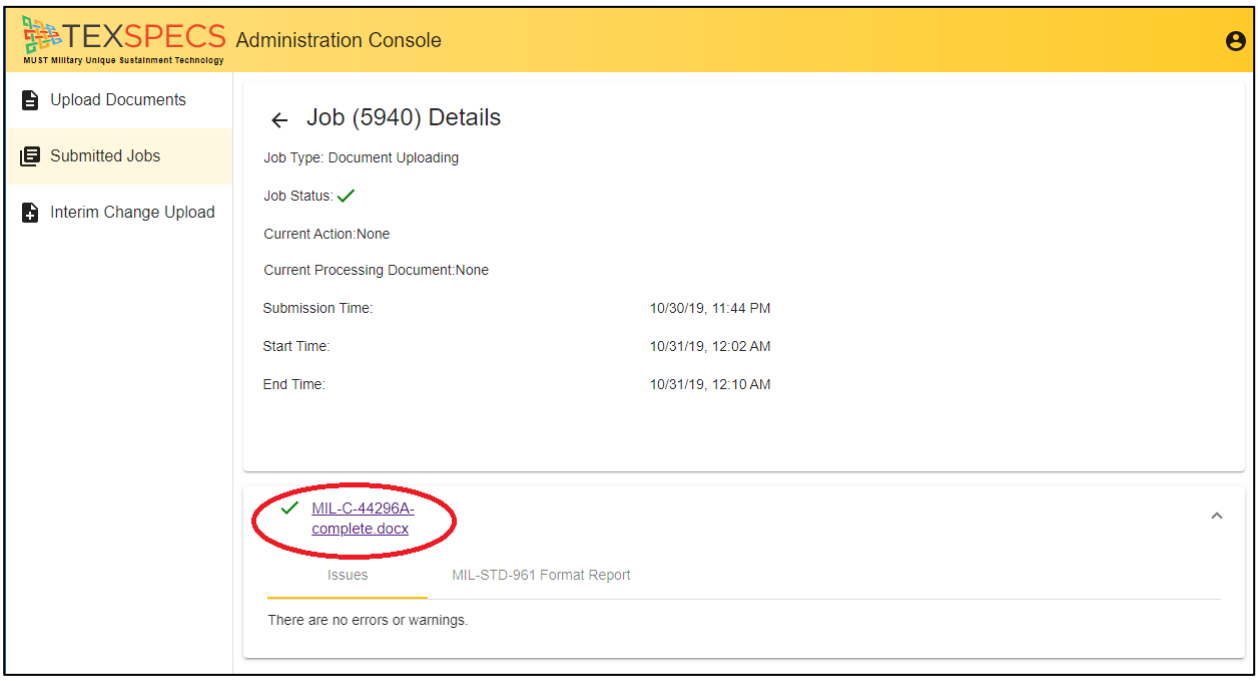


Clicking the link (circled below) will take you to the document in TexSpecs:



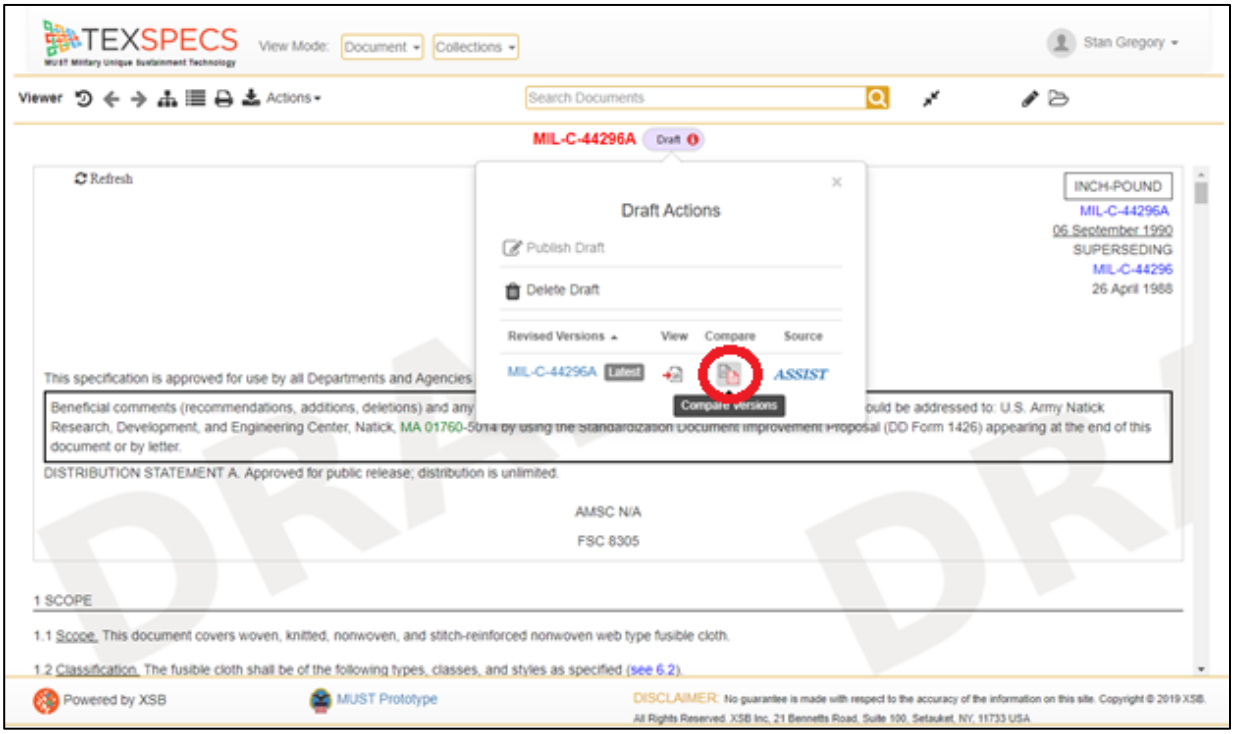
6.6 Viewing Uploaded "Draft" Document in TexSpecs

Click the link that is the name of the uploaded file to load the document in TexSpecs (see circled below):

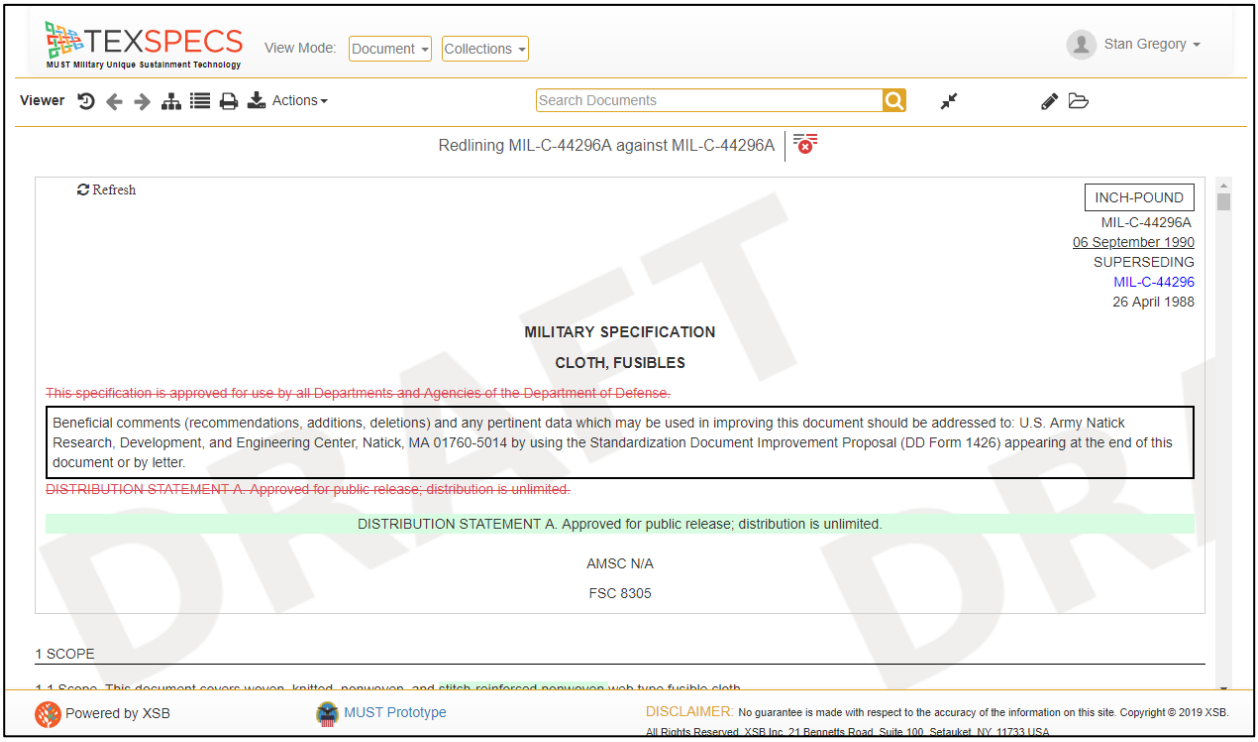


6.7 Verify Integrated Changes

Once you have the document loaded in TexSpecs, you can use the redline functionality in TexSpecs to view your changes. Click the "Draft" chip, and then click the icon showing overlapping documents (circled below):



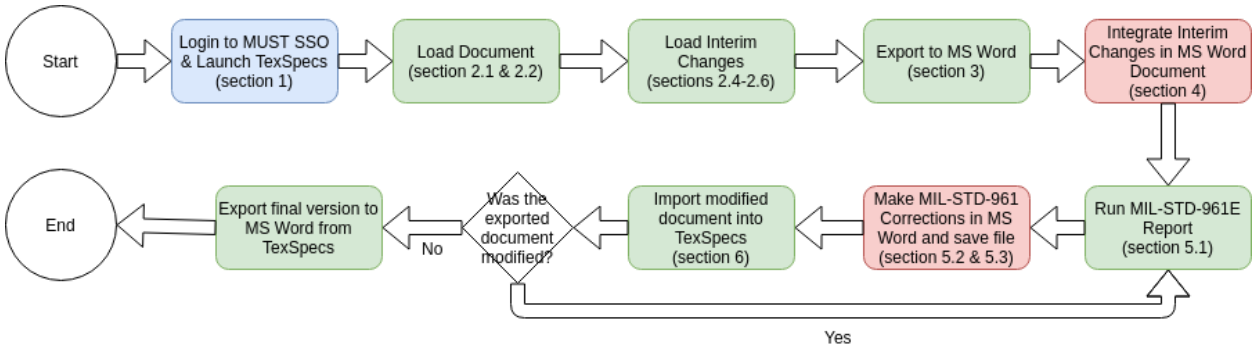
This will show text removed in red with a strikeout through it, and added text highlighted in light green:



6.8 Repeat Steps Until Finished

Go back to the “5 MIL-STD-961E Format Report” step until the document is correct, remembering to export the final version of the document “As Draft” in order to include the header information required for ASSIST coordination.

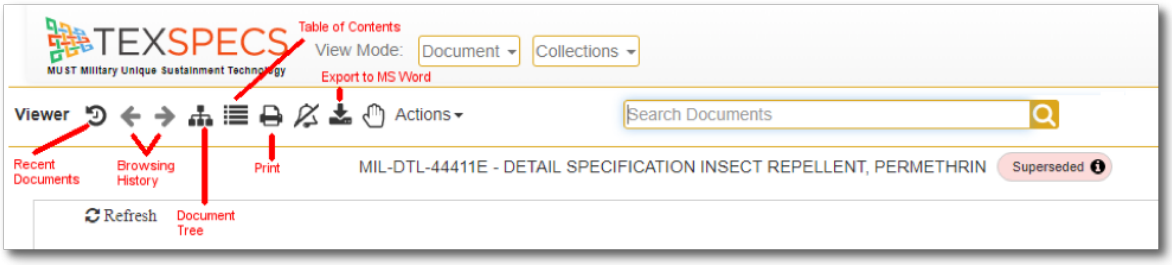
7 Appendix A – Specification Modernization Workflow



Key
Blue: MUST SSO
Green: TexSpecs
Red: MS Word

8 Appendix B – TexSpecs Toolbar

There are several controls available in the 'Document' mode, as shown here:



8.1 Recent Documents

Display a list of documents viewed in this session allowing for easy navigation to a document, and area within document that has been recently viewed.

8.2 Browsing History

The back and forward buttons allow navigation back and forth between documents in the viewer that have been opened and links that have been followed (both inter-document links and intra-document links).

8.3 Document Tree

Opens the Document Tree dialog which displays a list of all documents that are available.

8.4 Table of Contents

Displays table of contents as links that allow for navigation directly to document contents.

8.5 Print

The print button will print the document that is currently open in the viewer.

8.6 Export to MS Word

The button will allow the document to be downloaded as a Microsoft Word document. The option to generate an exported document with draft formatting is provided as an additional option.

9 Student Notes

Date	Notes

Date	Notes

Date	Notes

Date	Notes