

# Requirements Analysis

## Smarter Balanced Assessment Consortium Test Delivery System

### Component: Test Registration Level II Requirements

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Revision History

| Revision Description             | Author/Modifier | Version | Date       |
|----------------------------------|-----------------|---------|------------|
| Initial working version          | Paul Krumrei    | 0.1     | Aug 7 2013 |
| Added 508 Compliant Requirements | Paul Krumrei    | .02     | Mar 6 2014 |
|                                  |                 |         |            |
|                                  |                 |         |            |
|                                  |                 |         |            |

## I. Introductions

### 1. Terms and Definitions

| Term | Definition |
|------|------------|
|      |            |

## II. Component Description

The following description is provided in the Architecture Document.

This component registers the student(s) for assessments and interacts with the Student Information System (SIS) to gather the student information and the

accessibility profile, used by the Test Administration component. It must also manage staff identification for managing the assessment event.

NOTE: It is quite understandable if the Test Registration and Test Administration components need to be merged into a single component as the features of the registration component can be seen as administration functions.

## SUMMARY OF CAPABILITIES:

The Test Registration component will provide the web services and repository for registration functionality. The Test Administration component will provide the user interface (UI) for this functionality so this component is limited to APIs and automated data exchange interfaces. The registration component provides data exchange interfaces for students, users, rosters, schools, and districts.

## III. Key Functions

The following are the key functions of the Test Registration component are:

1. Browse Permissions for role information
2. Provide a user interface for management of information
3. Provide the means for appropriate users to upload information
4. Provide information and a synchronization function with or without Identity Information to a Consortium and/or a locally deployed data warehouse
5. Provide information and a synchronization function to Single Sign-On
6. Provide a scalable REST interface to provide just-in-time student information to Test Delivery

The Architecture Report describes the Test Registration component as follows:

*This component registers the student(s) for assessments and interacts with the Student Information System (SIS) to gather the student information and the accessibility profile, used by the Test Administration component. It must also manage staff identification for managing the assessment event.*

*NOTE: It is quite understandable if the Test Registration and Test Administration components need to be merged into a single component as the features of the registration component can be seen as administration functions*

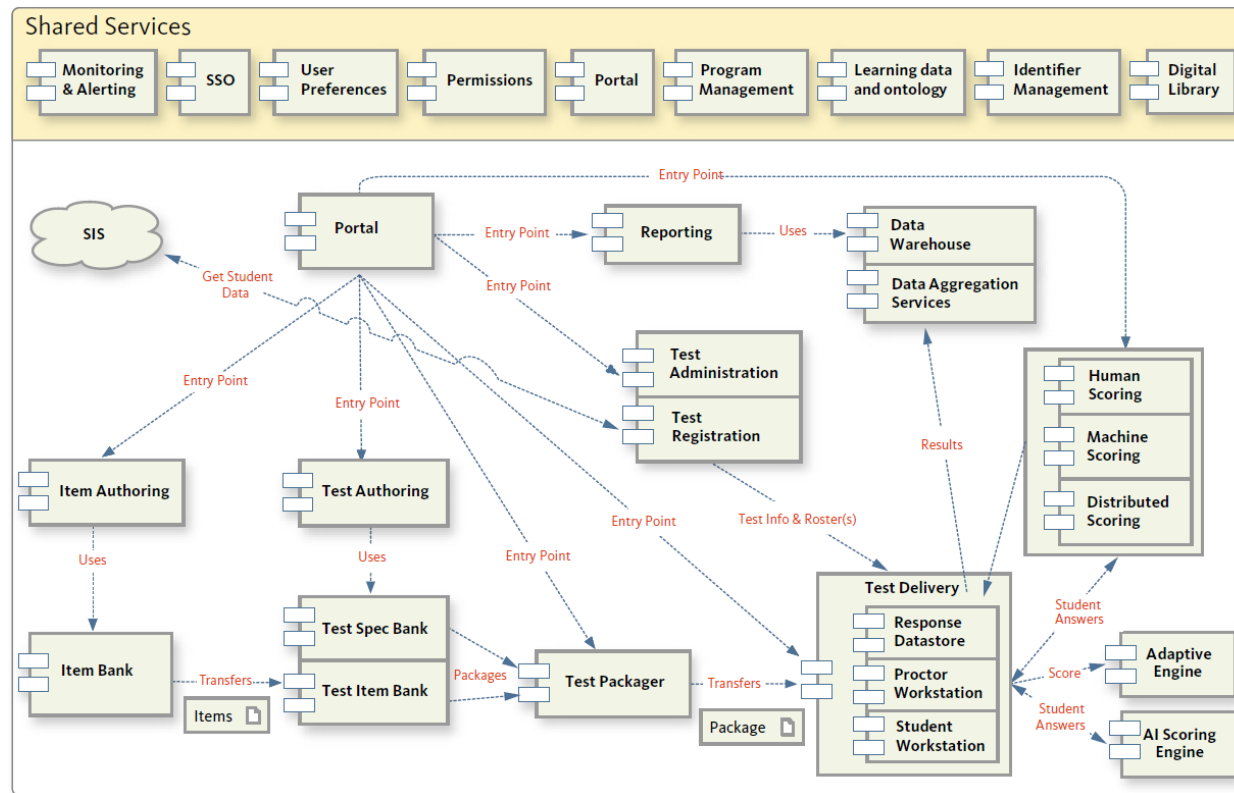


Figure 1. Component Logical Interfaces (Figure 4.3) in Architecture Report

The following process flow diagram from the Architecture Report illustrates Test Registration's function in the process flow from Item Bank to Test Delivery.

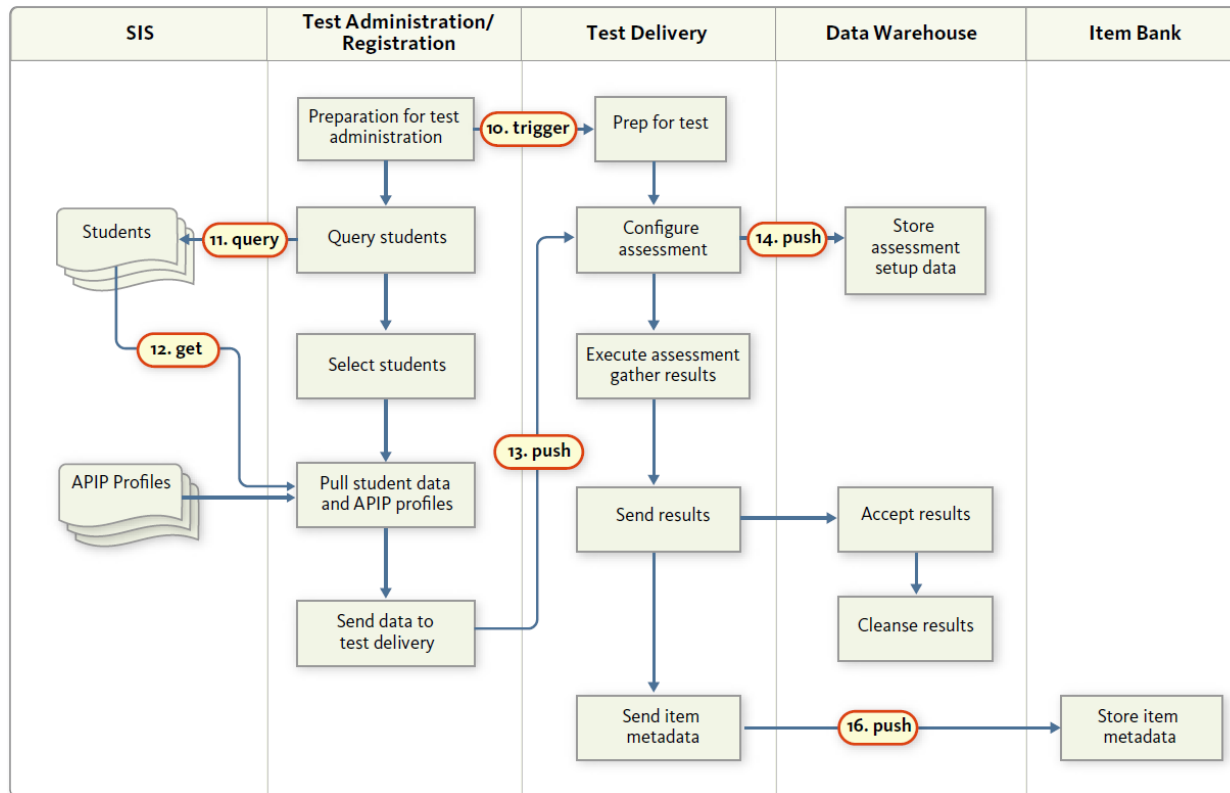
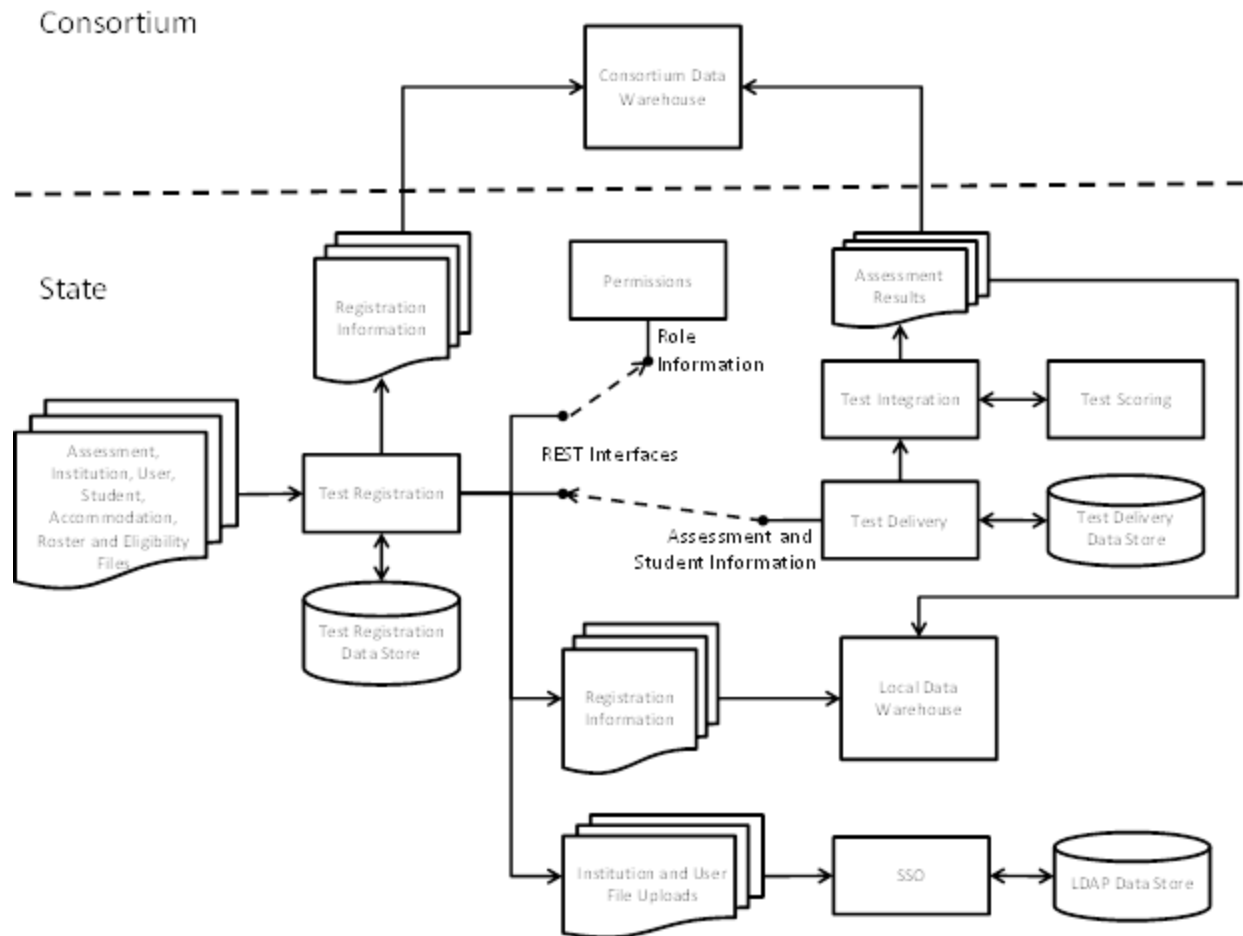


Figure 2. Architecture Report Figure 8.1.2 Item Bank to Test Delivery



## IV. Technical Direction

The following technical direction applies to the Program Management component:

1. The development language shall be Java
2. The database shall be a relational MySQL database

3. Interfaces shall be RESTful APIs exposed to client components that are querying and retrieving test specifications
4. Test Registration packages shall be XML and follow the format described in *testpackage.dtd*
5. File uploads to Test Registration shall be flat files in CSV, Excel 2003 .xls format or Excel 2007 or later .xlsx format
6. File downloads from Test Registration to other components shall be flat files in CSV format

## V. Assumptions

|  | Assumption | Comments |
|--|------------|----------|
|  |            |          |
|  |            |          |

## VI. Issues/Questions

| Issue  | Status/Status | Response |
|--|---------------|----------|
| Caching of information – Need to discuss the non-use of Cache. | OPEN          |          |
|  |               |          |

Requirements are numbered according to the following convention:

- 1) RFP.## - a requirement from the RFP
- 2) RADTIB.## - a requirement from the detailed requirements from RFP-11 or the Architecture document
- 3) PRTIB.## - a requirement from the Proposal



## VII. Requirements

| Source.ID | Requirement   | JIRA# | Priority | Comments  |
|-----------|---|-------|----------|---|
| RFP.89    | The Test Registration component will provide an interface for querying students that need to be registered for test assessments.  |       |          | The query response will contain the necessary identifiers to be supplied to the Test Delivery component in order to link students to their appropriate test responses. The UI for this function is part of the Test Administration component. |
| RFP.89.1  | <b>Input:</b> SIF compliant XML for student information   |       |          |   |
| RFP.89.2  | <b>Output:</b> SIF compliant XML for student information  |       |          |   |
| RFP.90    | The Test Registration component will interface with the Test Delivery component using SIF compliant XML APIs.   |       |          |   |
| RFP.91    | The Test Registration component will provide an interface for accepting student information that is keyed into the Test Administration component  |       |          | This is for any student(s) that was not uploaded from SIS systems.  |
| RADTIB.1  | <p>The Test Registration component will be built with Open Source Technologies The component will contain:</p> <ul style="list-style-type: none"> <li>• web services,</li> <li>• business logic,</li> <li>• any repositories to implement the registration functionality</li> </ul> |       |          |   |
| RADTIB.2  | The Test Registration component will communicate with student information systems   |       |          | The bulk of the data will be uploaded through SIF compliant APIs.   |

## Test Registration – Level II Requirements

|            |  |  |  |  |
|------------|--|--|--|--|
|            | prior to registering students for test sessions  |  |  |  |
| RADTIB.2.1 | <b>Input:</b> SIF compliant XML for student information  |  |  |  |
| RADTIB.2.2 | <b>Output:</b> Simple XML response meta data (success, error, etc.)  |  |  |  |
| RADTIB.3   | The Test Registration component will supply student identifiers to the Test Delivery component.                                      |  |  |  |
| RADTIB.7   | The Test Registration component will provide a repository and interfaces for user access   |  |  | This will include site information that allows the system to determine which users will have access to particular student information and details during the registration process. |
| RADTIB.8   | The Test Registration component will support an interface allowing states to send student information in a non-SIF-compliant format. |  |  | The Test Registration component will not transform data to this CSV format.  |
| RADTIB.8.1 | The format will be a CSV file created based on the SIF student structure.  |  |  |  |
| RADTIB.8.2 | Non-SIF-compliant data files should be translated to SIF-compliant XML for use with the other components of the overall system.      |  |  |  |
| RADTIB.9   | The Test Registration component will provide performance metrics, error logging, and work flow                                       |  |  | This will use the framework specified in the alerts and monitoring component details in a later section of this document.  |

|           |   |  |  |   |
|-----------|---|--|--|---|
|           | alerts to the monitoring and alerting component.  |  |  |   |
| RADTIB.10 | <b>Student data:</b> The student data represent the SIF-compliant XML data.   |  |  |   |
| RADTIB.11 | <b>Status and linking data:</b> The status and linking data represent the information required to link students to the test sessions.   |  |  |   |
| RADTIB.12 | Test Registration requires knowledge of roles.  |  |  | Users are assigned one or more roles. Roles, in concert with associated entities, provides components with information they require to grant access to particular component features to users, and to carry out other business rules based on a particular user's assigned roles. |
| RADTIB.13 | <p>Test Registration is responsible for providing entity information to downstream components. The following is the hierarchy of entities from top to bottom:</p> <ol style="list-style-type: none"> <li>1. CLIENT</li> <li>2. GROUPOFSTATES</li> <li>3. STATE</li> <li>4. GROUPOFDISTRICTS</li> <li>5. DISTRICT</li> <li>6. GROUPOFINSTITUTIONS</li> <li>7. INSTITUTION</li> </ol> |  |  |   |
| RADTIB.14 | <p>User file uploads will contain:</p> <ul style="list-style-type: none"> <li>● user's name</li> <li>● email</li> </ul>   |  |  |   |

|             |   |  |  |  |
|-------------|---|--|--|--|
|             | <ul style="list-style-type: none"> <li>• address</li> <li>• phone number</li> <li>• identifier</li> <li>• role</li> <li>• associated entity, the level of the associated entity</li> <li>• entity chain for the associated entity.</li> <li>• grade, demographic information</li> <li>• state</li> <li>• district</li> <li>• institution identifiers</li> </ul> |  |  |  |
| RADTIB.14.1 | There should be one row for each role-entity combination that applies to the user   |  |  |  |
| RADTIB.14.2 | The user's information should be the same from row to row.  |  |  |  |
| RADTIB.14.3 | If the user information varies, the rule is that the "last row wins" rule applies and the user information stored is that of the last row.  |  |  |  |
| RADTIB.14.4 | User file upload includes an Action column that indicates to Test Administration that this is an addition, a deletion or a modification of this user's information.   |  |  |  |
| RADTIB.15   | <p>Accommodation upload files contain the student's</p> <ul style="list-style-type: none"> <li>• SSID,</li> <li>• the assessment subject for which the accommodations apply</li> <li>• various accommodation codes.</li> </ul>  |  |  | No Action column is required because uploading a student's accommodations either add or update the student's accommodation. The student identified by the SSID in the Accommodation file upload must already exist |

## Test Registration – Level II Requirements

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|             |  |  |  | in the system or a validation error will result.  |
| RADTIB.16   | <p>Roster information will identify the roster by:</p> <ul style="list-style-type: none"> <li>• name,</li> <li>• email address of the user that owns the roster,</li> <li>• state</li> <li>• district</li> <li>• school IDs</li> <li>• SSID</li> </ul> |  |  | The Action column indicates whether this student record is to be added to or deleted from the roster by containing “ADD” or “DEL.”        |
| RADTIB.17   | <p>The Eligibility will contain:</p> <ul style="list-style-type: none"> <li>• SSID</li> <li>• administration name,</li> <li>• subject</li> <li>• name of the assessment</li> <li>• Action column</li> </ul>  |  |  | No update feature is provided; the student eligibility should be deleted from one assessment and added to another.                        |
| RADTIB.17.1 | User interface in Test Registration will be able to add the following information to the assessment for eligibility:   |  |  |   |
| RADTIB.17.2 | Implicit Eligibility   |  |  | If implicit eligibility is selected, administrative users must also provide eligibility rules via the Assessment UI in Test Registration. |
| RADTIB.17.3 | Explicit Eligibility   |  |  | A student is eligible to take an assessment configured for explicit eligibility only if an Eligibility record in an Eligibility           |

## Test Registration – Level II Requirements

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|             |   |  |  | file upload explicitly registers the student for the assessment.   |
| RADTIB.17.4 | Test Windows  |  |  | Administrative users must add start and end dates for test windows for particular assessment   |
| RADTIB.17.5 | Number of Opportunities   |  |  | Number of opportunities is entered by the administrative users into the Test Registration user interface for a given assessment.                   |
| RADTIB.17.6 | Delay Rule  |  |  | A configurable number of days are provided so that a student must wait at least that many days between test opportunities                          |
| RADTIB.18   | Download Files to the Data Warehouse  |  |  | Registration records are sent to the Data Warehouse as soon as Test Registration determines that a student is eligible for a particular assessment |
| RADTIB.18.1 | <p>The registration record that is sent to the Data Warehouse consists of concatenation of the same fields contained in the following file upload formats:</p> <ul style="list-style-type: none"> <li>• Student</li> <li>• Eligibility</li> </ul> |  |  |  |

## Test Registration – Level II Requirements

|             |  |  |  |   |
|-------------|--|--|--|---|
|             | See Table 3.   |  |  |   |
| RADTIB.18.2 | <p>Test Registration sends one record to the Data Warehouse for each assessment the student is eligible to take.</p> <p>See Table 4</p>  |  |  |   |
| RADTIB.18.3 | <p>Data Warehouse is configured in Program Management to receive de-identified student information, the registration information sent to the Data Warehouse needs to generate with blank fields for:</p> <ul style="list-style-type: none"> <li>• FirstName,</li> <li>• LastName,</li> <li>• MiddleName</li> <li>• BirthMonth</li> <li>• BirthDay,</li> <li>• BirthYear</li> <li>• SSID</li> <li>• ExternalSSID</li> </ul> |  |  | <p>Reply from David Hi Paul, you are correct, there is only one role per row in the import file, but there can be multiple rows. Yes, the UI should permit the assignment of any arbitrary number of roles, each associated with an allowable entity. Permissions, who is the owner of roles, also provides an enumeration that indicates the level of the allowable entities to associate with that role. TR should only offer users entities at those levels.</p> <p>For example, if “Test Author” can only be associated with CLIENT and STATE, then TR should only off those and not any other level.</p> |
| RADTIB.18.4 | The format of the file downloaded to the Data Warehouse is documented in the Data Warehouse tab in: SBAC 11 Operational System Test Registration File Formats.xlsx.  |  |  |   |
| RADTIB.19   | The Data Warehouse will perform validations on students registration data  |  |  | One form of validation is to ensure that student demographics are consistent for the same student from year to year. The demographics for a given student may change,   |

## Test Registration – Level II Requirements

|             |  |  |  |   |
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|             |  |  |  | but the Data Warehouse may also (for example) check that demographics from multiple students from the same school are consistent from year to year. The results of these validations are transmitted back to Test Registration. |
| RADTIB.19.1 | Provide Identifier Management as the Data Warehouse is allocated the responsibility for tracking students that move from one Smarter Balanced state to another.  |  |  | The Data Warehouse should provide interfaces for such notifications, and Test Registration provides the user interface for administrative users to enter this information.  |
| RADTIB.20   | Use Single Sign-On (SSO) that is provided with user files.   |  |  | The format of the file downloaded to the Data Warehouse is documented in the SSO tab of <a href="#">1. SBAC 11 Operational System Test Registration File Formats.xlsx</a> .   |
| RADTIB.21   | <p>Allow Test Reg to interface with Test Delivery that requires the following information:</p> <ul style="list-style-type: none"> <li>• Assessment information is required for presentment to the Proctor to select from available assessments to start a test session</li> <li>• Institution information is required to assess business rules that match students to proctors by school</li> <li>• Eligibility information to determine whether students are eligible to take assessments selected by a proctor in a test session</li> <li>• Accommodations information to Test Delivery can provide the appropriate</li> </ul> |  |  |   |



## Test Registration – Level II Requirements

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|             | tools and accommodations to the student   |  |  |  |
| RADTIB.22   | Allow Test Reg the Use of Permissions   |  |  | <p>The Permissions component provides REST interfaces to browse for roles, component permissions and the mapping between these.</p> <p>Components cache this information so that authorization and tenancy can be determined when a user is authenticated.</p> |
| RADTIB.23   | Data synchronization procedures are to be provided by Test Registration for the Data Warehouse and SSO where Test Registration generates master download files tailored for each of these components    |  |  |  |
| RADTIB.24   | Create communication channels between Test Registration and the Data Warehouse  |  |  |  |
| RADTIB.24.1 | Test Registration and the Data Warehouse should communicate over REST interfaces to initiate a file download,   |  |  | Should provide the means for the Data Warehouse to respond with validation results and completion data when the Data Warehouse has finished consuming the download file provided by Test Registration  |
| RADTIB.24.2 | Identifier Management: Test Registration should use REST interfaces provided by the Data Warehouse to communicate information regarding a former student registration in another Smarter Balanced state |  |  |  |

|             |   |  |  |  |
|-------------|---|--|--|--|
|             |   |  |  |  |
| RADTIB.24.3 | Synchronization: REST interfaces are required to initiate and manage synchronization procedures between Test Registration and the Data Warehouse                              |  |  |  |
| RADTIB.25   | Test Registration will provide two REST APIs for Test Delivery to browse assessment data  |  |  |  |
| RADTIB.25.1 | Test Delivery will call this API to retrieve a list of configured assessments when a proctor wishes to open a test session  |  |  |  |
| RADTIB.25.2 | The list of available assessments is presented to the proctor, and the proctor selects from this list to open a test session  |  |  |  |
| RADTIB.25.3 | Authentication, authorization and Information about the proctor is provided by SSO and not by Test Registration prior to calling this API to retrieve the list of assessments |  |  |  |
| RADTIB.26   | Use the REST API to retrieve a Student Package  |  |  |  |
| RADTIB.26.1 | Test Delivery calls this API when a student provides their credentials to the Student application   |  |  |  |

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|-------------|--|--|--|---|
| RADTIB.26.2 | The API looks up this students information and returns student attributes, demographics, institution chain, accommodations, and information about the assessments the student is eligible to take  |  |  | This information is used to assess business rules in Test Delivery, and determine which of the assessments on this test session to make available for the student to select |
| RADTIB.26.3 | Interface should be accessed using Single Sign On (SSO)  |  |  |   |
| RADTIB.26.4 | Interface should also validate Permissions   |  |  |   |
| RADTIB.27   | Test Registration provides user access based on five roles:<br>See Table 5   |  |  |   |
| RADTIB.28   | Model features of Test Registration on the TIDE model.   |  |  |   |
| RADTIB.28.1 | <p>TIDE can be used as a model for the following features of Test Registration that are common between various entity types.</p> <ol style="list-style-type: none"> <li>1. Landing page and icons displayed</li> <li>2. Navigation</li> <li>3. Search functions</li> <li>4. Search results</li> <li>5. File upload (specifically the four-step file upload model: choose file, preview file, validate file, confirmation)</li> </ol> |  |  | Using TIDE as a model is desirable because Smarter Balanced personnel, states, districts and schools are familiar with TIDE features.                                       |

|           |   |  |  |  |
|-----------|---|--|--|--|
|           |   |  |  |  |
| RADTIB.29 | SB requires that when changes are made to a student file, ADD/EDIT/DELETED that this action be captured and the older file be saved in order for users to audit any changes made to files.  |  |  |  |
| RADTIB.30 | System requires that interface is compliant with Federal 508 requirements with those who have a sight or hearing disability   |  |  | See both 508 requirements sections below |
| RADTIB.31 | <p>(UI) Create CRUD UI for student group data<br/>A UI needs to be created to manage CRUD functionality for Roster data. Also include search, export, and print capability.</p> <p>Testing Information:</p> <p>CRUD only. This does not cover business rules or validations. To test simply do the three things we do (create, update and delete) through UI and verify the information is persisted to the database.</p> |  |  | TESTREG-31 has been created              |

## VIII. User Interface Components

As described above, the Test Spec Bank is a repository of test specifications and does not require a user interface. It only exposes REST APIs to client components.



## 1.1 Summary of User Interface Functions

The following table summarizes the user interface features of the Test Registration system and indicates the roles that are applicable to each function.

|             |                       |                                    |                       |   | Role                     |                                       |                                       |                                       |            |
|-------------|-----------------------|------------------------------------|-----------------------|---|--------------------------|---------------------------------------|---------------------------------------|---------------------------------------|------------|
| Category    | Function              | Feature                            | TIDE Manual Reference | Description   | Admin                    | State Coord                           | District Coord                        | School Coord                          | Test Admin |
| Assessment  | View/Edit Assessment  | Search for Assessment              | N/A <sup>1</sup>      | User searches for assessments; search results are presented in a <a href="#">tabular search results page</a>  | <input type="checkbox"/> |                                       |                                       |                                       |            |
| Assessment  | View/Edit Assessment  | Delete Assessment                  | N/A <sup>1</sup>      | User selects one or more assessments from <a href="#">tabular search results page</a> and deletes them  | <input type="checkbox"/> |                                       |                                       |                                       |            |
| Assessment  | View/Edit Assessment  | Export Assessments                 | N/A <sup>1</sup>      | User selects particular assessments from the <a href="#">search results page</a> for export OR chooses to export all assessments in the search results in Excel or CSV format   | <input type="checkbox"/> |                                       |                                       |                                       |            |
| Assessment  | View/Edit Assessment  | Print Assessments                  | N/A <sup>1</sup>      | User selects particular assessments from the <a href="#">search results page</a> for print OR chooses to print all assessments in the search results                            | <input type="checkbox"/> |                                       |                                       |                                       |            |
| Assessment  | Upload Assessment     | Upload Assessment file             | N/A <sup>1</sup>      | User uploads an assessment XML package from the Test Packager; this can only add a new assessment or modify an existing assessment  | <input type="checkbox"/> |                                       |                                       |                                       |            |
| Institution | View/Edit Institution | Create Institution                 | N/A <sup>2</sup>      | User creates a state, district or school entity   | <input type="checkbox"/> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> |            |
| Institution | View/Edit Institution | Search for Institution             | N/A <sup>2</sup>      | User searches for state, district or school entities; search results are presented in a <a href="#">tabular search results page</a>   | <input type="checkbox"/> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> |            |
| Institution | View/Edit Institution | Update Institution                 | N/A <sup>2</sup>      | Users selects a particular institution from a <a href="#">tabular search results page</a> and updates it  | <input type="checkbox"/> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> |            |
| Institution | View/Edit Institution | Delete Institution <sup>3</sup>    | N/A <sup>2</sup>      | User selects one or more institutions and deletes them  | <input type="checkbox"/> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> |            |
| Institution | View/Edit Institution | Export Institution                 | N/A <sup>2</sup>      | User selects particular institutions from the <a href="#">search results page</a> for export OR chooses to export all institutions in the search results in Excel or CSV format | <input type="checkbox"/> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> |            |
| Institution | View/Edit Institution | Print Institution                  | N/A <sup>2</sup>      | User selects particular institutions from the <a href="#">search results page</a> for print OR chooses to print all institutions in the search results                          | <input type="checkbox"/> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> |            |
| Institution | Upload Institution    | Download Institution File Template | N/A <sup>2</sup>      |   |                          | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> |            |
| Institution | Upload Institution    | Upload Institution File            | N/A <sup>2</sup>      | User uploads an institution file containing states, districts and/or schools  | <input type="checkbox"/> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> |            |
| Student     | View/Edit Student     | Create Student                     | 24                    | User creates a new student and supplies demographic, institution, accommodation and eligibility information   | <input type="checkbox"/> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> | <input type="checkbox"/> <sup>3</sup> |            |

<sup>1</sup> This is a new function not available in TIDE: TIDE does not have a user-accessible means of configuring assessments

<sup>2</sup> This function is not available in the TIDE user manual, but refer to the Student Search, Update, Delete, Export, Download, Upload or Print for a UI pattern reference

<sup>3</sup> Visibility of data is limited by role to state, district or school level

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|         |                       |                                       |                  |   |                          |                          |                          |                          |                          |
|---------|-----------------------|---------------------------------------|------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Student | View/Edit Student     | Search for Student                    | 17               | User searches for students; search results are presented in a tabular search results page   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Student | View/Edit Student     | Update Student                        | 20               | User selects a student from the tabular search results page and updates student information including demographic, institution, accommodation and eligibility information   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| Student | View/Edit Student     | Delete Student                        | 18               | User selects one or more students from the tabular search results page and deletes them   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| Student | View/Edit Student     | Update Identifier Management          | N/A <sup>1</sup> | User selects a student from the tabular search results page and selects to update Identifier Management information; this can be a different identifier from the same state or from a different state   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| Student | View/Edit Student     | Export Student                        | 19               | User selects particular students from the search results page for export OR chooses to export all students in the search results in Excel or CSV format   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| Student | View/Edit Student     | Print Student                         | 20               | User selects particular students from the search results page for print OR chooses to print all students in the search results  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Student | Upload Students       | Download Student File Template        | 30               | User downloads an empty template file to facilitate providing student information in the correct format   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| Student | Upload Students       | Upload Student file                   | 30-35            | User uploads a student file; this can add, delete or modify students and student and demographic information  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| Student | Upload Accommodations | Download Accommodations file Template | 30               | User downloads an empty accommodations template file to facilitate providing accommodation information in the correct format  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| Student | Upload Accommodations | Upload Accommodations file            | 31-35            | User uploads an accommodation file that creates student accommodations for particular subjects  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| Student | Upload Eligibility    | Download Eligibility File Template    | N/A <sup>2</sup> | User downloads a student eligibility template file to facilitate providing eligibility information in the correct format  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| Student | Upload Eligibility    | Upload Eligibility file               | N/A <sup>2</sup> | User uploads an eligibility file that makes students eligible for assessments where explicit eligibility is required  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| User    | View/Edit User        | Create User                           | 41               | User creates a new user and assigns one or more user roles and an associated entity for each user role  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| User    | View/Edit User        | Search for User                       | 37               | User searches for user; search results are presented in a tabular search results page   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| User    | View/Edit User        | Update User                           | 37               | Users selects a particular user from a tabular search results page and updates it, including changing user information, adding or deleting roles and associated entities, deleting roles and associated entities, or changing roles/entities or reassigning new entities to existing role | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| User    | View/Edit User        | Delete User                           | 38               | User selects one or more users from the search results page and deletes them  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| User    | View/Edit User        | Export User                           | 39               | User selects particular users from the search results page for export OR chooses to export all users in the search results in Excel or CSV format   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| User    | View/Edit User        | Print User                            | 37               | User selects particular users from the search results page for print OR chooses to print all users in the search results  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| User    | Upload Users          | Download User File Template           | 42               | User downloads a user template file to facilitate providing user information in the correct format  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |

<sup>4</sup> Read-only: Test Administrators can only view and not modify student information

## Test Registration – Level II Requirements

|                 |                               |   |      |   |                          |                            |                            |                            |  |
|-----------------|-------------------------------|---|------|---|--------------------------|----------------------------|----------------------------|----------------------------|--|
| User            | Upload Users                  | Upload User file                                | 42   | User uploads a User file that can add, delete or modify users and user information  | <input type="checkbox"/> | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ |  |
| Roster          | View/Edit Roster              | Create Roster                                   | N/A² | User creates a new roster and assigns an owner and students to the roster   | <input type="checkbox"/> | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ |  |
| Roster          | View/Edit Roster              | Search Roster                                   | N/A² | User searches for rosters; search results are presented in a tabular search results page  | <input type="checkbox"/> | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ |  |
| Roster          | View/Edit Roster              | Update Roster                                   | N/A² | User selects a particular roster from a tabular search results page and updates it  | <input type="checkbox"/> | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ |  |
| Roster          | View/Edit Roster              | Delete Roster                                   | N/A² | User selects one or more rosters from the search results page and deletes them  | <input type="checkbox"/> | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ |  |
| Roster          | View/Edit Roster              | Export Roster                                   | N/A² | User selects particular rosters from the search results page for export OR chooses to export all rosters in the search results in Excel or CSV format | <input type="checkbox"/> | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ |  |
| Roster          | View/Edit Roster              | Print Roster                                    | N/A² | User selects particular rosters from the search results page for print OR chooses to print all rosters in the search results                          | <input type="checkbox"/> | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ |  |
| Roster          | Upload Roster                 | Download Roster File Template                   | N/A² | User downloads a roster template file to facilitate providing roster information in the correct format  | <input type="checkbox"/> | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ |  |
| Roster          | Upload Roster                 | Upload Roster file                              | N/A² | User uploads a Roster file that can add or delete students from a roster  | <input type="checkbox"/> | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ |  |
| Synchronization | Download Synchronization Data | Download Synchronization data to Data Warehouse | N/A² | Downloads all available registration records to the Data Warehouse  | <input type="checkbox"/> | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ |  |
| Synchronization | Download Synchronization Data | Download Synchronization data to SSO            | N/A² | Downloads all available User records to SSO   | <input type="checkbox"/> | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ | <input type="checkbox"/> ³ |  |

Table 5. Summary of User Interface Functions





## Data Transfer Listing

The Test Spec Bank interfaces consume and provide test specifications that conform to the accompanying DTD called *testpackage.dtd*.

| Component Providing the Interface | Component Consuming the Interface | Input Data | Output Data | Data Format | Data Standard | Transfer Method | Notes/Description |
|-----------------------------------|-----------------------------------|------------|-------------|-------------|---------------|-----------------|-------------------|
|                                   |                                   |            |             |             |               |                 |                   |
|                                   |                                   |            |             |             |               |                 |                   |
|                                   |                                   |            |             |             |               |                 |                   |

## IX. Data and Data Relationships

| File Upload Format | Description  |
|--------------------|--|
| Student            | all student attributes, demographics and attributes contained in the Student file upload |
| Eligibility        | all assessment eligibility information contained in the Eligibility file upload          |

**Table 3. Data Warehouse Registration Record Components**

| Trigger                        | Description   |
|--------------------------------|---|
| Update of student information  | Any time student information is updated via user interface input or file upload, the Data Warehouse needs to be notified of the change. A full registration record is sent for each assessment the student is eligible for.   |
| Update of eligibility criteria | If eligibility criteria for an assessment is changed such that eligibility changes for a one or more students, a file is downloaded to the Data Warehouse with a record for each student whose eligibility changed (became eligible or ineligible)  |
| Addition of a new assessment   | If a new assessment is added and implicit eligibility rules are configured such that some number of students become eligible for that assessment, then a file is downloaded to the Data Warehouse with a record for each student that became eligible for the new assessment as a result of assessing the eligibility rules |
| Update of explicit eligibility | Any time a student's explicit eligibility for an assessment is updated by means of upload of an Eligibility file, the Data Warehouse must be notified by sending a new eligibility record. Added Information:<br>1. Eligibility rules belong to a particular assessment.  |

|  |  |
|--|--|
|  | <ol style="list-style-type: none"> <li>2. Particular assessments have one and only one subject.</li> <li>3. Eligibility rules are uploaded per subject.</li> <li>4. Eligibility rules that evaluate accommodations should only evaluate accommodations for subjects that match the subject of the assessment.</li> </ol> |
|--|--|

**Table 4. Data Warehouse Registration Resend Triggers**

| Role                 | Description  |
|----------------------|--|
| Administrator        | The Administrator is a global role across components and has unfettered access to all component's features   |
| State Coordinator    | State Coordinators are able to create other State Coordinator accounts as well as District and School Coordinator accounts and Test Administrator accounts. They are able to upload data across all districts and schools within their states. |
| District Coordinator | State Coordinators are able to create other District Coordinator accounts as well as School Coordinator and Test Administrator accounts. They are able to upload data across all schools within their districts.                               |
| School Coordinator   | School are able to create other School Coordinator and Test Administrator accounts. They are able to upload data for their school only.  |
| Test Administrator   | Test Administrators can use the Test Registration user interface to search for and view student and accommodation information in a read-only manner.   |

**Table 5. Test Registration User Roles**

## 1.1 Managed Data

Test Registration is responsible for managing State, District, Institution, User, Student, Accommodation and Roster data. It does so in the

form of upload files provided by authorized users for mass communication of information to Test Registration, and in the form of a user interface provided for one-at-a-time communication of the same information. Test Registration validates the data to ensure that the upload files are properly formatted and consistent. If they are not, the user is informed of validation errors. Validated data is stored by Test Registration and transmitted via download files to the component(s) that are expected to be provided the data.

Test Registration is in turn responsible for providing information to downstream components. The Data Warehouse and SSO are provided with text files placed in a dropbox. SSO provides REST interfaces for Test Delivery to query for specific information.

|                | Test Delivery  | Data Warehouse   | SSO   | Permissions   |
|----------------|--|--|---|---|
| Role           |  |  |   | TR uses a Permissions REST API to obtain a list of roles and permissible entities for each role |
| Assessment     | TD calls a TR REST API to get a list of configured assessments   | TR sends DW a registration file download with a record for each assessment the student is eligible for that includes the student information and demographics and assessment information |   |   |
| State          | TD call a TR Rest interface to retrieve a student “package” that includes the student information and demographics, accommodations, and assessment eligibility information |  | TR sends SSO a file download with institution data              |   |
| District       |  |  |   |   |
| Institution    |  |  |   |   |
| Student        |  |  |   |   |
| Eligibility    |  |  |   |   |
| Accommodations |  |  |   |   |
| User           |  |  | TR sends SSO a file download with user data so it can provision |   |
| Roster         |  | TR sends DW a roster file download   |   |   |

Table 1. Classes of Data Managed by Test Registration

## Overview of 508 Compliant requirements

The Technical Requirements (§1194.21-§1194.26) generally have to do with definitions of how to properly code interface elements to ensure information is properly exported to assistive technologies.

The Functional Performance Criteria (§1194.31) in contrast cover the overall operation of a system by an individual with a particular type of disability. The functional performance criteria require that in addition to coding the system properly the overall system is usable to individuals with disabilities. The types of disabilities we are primarily targeting are:

1. Auditory (generally not applicable here because we do not use sound in any component).
2. Visual (requires screenreader support, as well as browser-based assistive capabilities).
3. Motor control (requires keyboard navigation and accessibility).

The final set of requirements relate to Information, Documentation, and Support (§1194.41) provided with the Smarter Balanced system. They require access to alternative document formats for end user documentation and provision of customer and technical support communications in an accessible fashion.

## Technical Requirements 508 Complaint

From § 1194.22 (*Web-based intranet and internet information and applications*), the following requirements shall be implemented:

| SECTION 508 SUBPART B - TECHNICAL REQUIREMENTS § 1194.22   | SHORT EXPLANATION  | REQUIRED ACTION  |
|--|--|--|
| (a) A text equivalent for every non-text element shall be provided (e.g., via “alt”, “longdesc”, or in element content).                         | Text description of all non-textual must exist (for assistive devices).          | Provide text description of all non-textual elements (add alt text as prescribed in the application-specific Accessibility Recommendation documents)   |
| (b) Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.   | Subtitles etc. for multimedia should be synchronized with the media.             | None - no multimedia exists  |
| (c) Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup. | Don't use color as the only way of conveying/distinguishing action/response etc. | Program Management: configuration history page: color is used as the only representation of changes made (additions/deletions). Action is to add alternate text to differentiate additions from deletions (or use another compatible mechanism). |

## Test Registration – Level II Requirements

|  |   |  |
|--|---|--|
| (d) Documents shall be organized so they are readable without requiring an associated style sheet.   | Documents should be readable (e.g. by a screen reader) without stylesheets          | This requires screen-reader compatibility. Add ARIA tags (and other changes) as prescribed in the application-specific Accessibility Recommendation documents.   |
| (e) Redundant text links shall be provided for each active region of a server-side image map.  | Server-side image maps must include text links                                      | None - no server-side maps are being used.   |
| (f) Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape. | Use client-side image maps wherever possible  | None - no client-side image maps are being used.   |
| (g) Row and column headers shall be identified for data tables.  | Use row/column headers for all data tables  | Program Management: Add row headers to all tables that do not currently have them. MNA: 1) In Search Results table, Header and Rows must be identified: Hidden left column.<br><br>2) Tables has no headers and no scope to define structure, also no summary for the table is provided. |
| (h) Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.             | Use markup to differentiate table header text from table data                       | MNA: Tables have no headers and no scope to define structure, also no summary for the table is provided  |
| (i) Frames shall be titled with text that facilitates frame identification and navigation.   | Use text titles/labels for all frames   | Program Management: Frame titles need to be added.<br><br>MNA: 1) Frame title does not receive focus<br><br>2) Search Filters header does not receive focus<br><br>3) Frame titles are images where an alt attribute is not provided   |
| (j) Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.                                  | No flashing or blinking objects (or page flickering) in the range (2Hz < f < 55 Hz) | None - no flashing of any kind is being used.  |

## Test Registration – Level II Requirements

|  |  |  |
|--|--|--|
| (k) A text-only page, with equivalent information or functionality, shall be provided to make a web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes. | Provide text-only page when no alternative is possible   | None - such pages don't exist in our system.   |
| (l) When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.  | If scripts are used to display content, they should provide alternative text as well                   | see (a) as it applies to dynamically-created content.  |
| (m) When a web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with §1194.21(a) through (l).   | If plugins are required, a text link must be provided to a plugin that is 508 / 1194.21 a-l -compliant | None - no plugins are being used.  |
| (n) When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.                       | Allow access to all form elements via assistive technology   | Ensure proper focus and keyboard navigation is available for all forms. Much of this is identified in the application-specific Accessibility Recommendation documents. |
| (o) A method shall be provided that permits users to skip repetitive navigation links.   | Allow skipping of repetitive navigation links that come before page content                            | Provide a way for screenreader users to skip navigation links and go directly to the main content of the page (e.g. link or keyboard)                                  |
| (p) When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.  | Alert user if timed response required, allow user to indicate more time is needed in sufficient time   | None - no timed response is being used.  |

## Test Registration – Level II Requirements

|   |  |  |
|---|--|--|
|   |  |  |
| SECTION 508 SUBPART C - FUNCTIONAL PERFORMANCE CRITERIA § 1194.31   | SHORT EXPLANATION  | REQUIRED ACTION  |
| (a) At least one mode of operation and information retrieval that does not require user vision shall be provided, or support for assistive technology used by people who are blind or visually impaired shall be provided.  | Screenreader support   | Provide screenreader support. MnA Notification Rule Search: Attribute edit field is not associated with its label; label id is missing.<br><br>MNA Date picker for Start and End Date, when holding Ctrl + arrow, is vocalized improperly: blank, blank... |
| (b) At least one mode of operation and information retrieval that does not require visual acuity greater than 20/70 shall be provided in audio and enlarged print output working together or independently, or support for assistive technology used by people who are visually impaired shall be provided. | Support for ability to enlarge fonts to support vision of up to 20/70, or support for assistive technology. (I think screenreader should cover this) | None - Screenreader and/or built-in browser zoom should cover this requirement.  |
| (c) At least one mode of operation and information retrieval that does not require user hearing shall be provided, or support for assistive technology used by people who are deaf or hard of hearing shall be provided.  | support for deaf / hard-of-hearing.  | None - no audio used in our system.  |
| (d) Where audio information is important for the use of a product, at least one mode of operation and information retrieval shall be provided in an enhanced auditory fashion, or support for assistive hearing devices shall be provided.  | support for assistive devices (none of our apps do audio)  | None - no audio used in our system.  |
| (e) At least one mode of operation and information retrieval that does not require user speech shall be provided, or support for assistive technology used by people with   | alternative for user speech if required. (none of our apps require speech recording or recognition)  | None - no speech input/recording used in our system.   |



## Test Registration – Level II Requirements

|   |  |   |
|---|--|---|
| disabilities shall be provided.   |  |   |
| (f) At least one mode of operation and information retrieval that does not require fine motor control or simultaneous actions and that is operable with limited reach and strength shall be provided. | support for operation that does not require fine motor control (as long as the application is keyboard accessible and doesn't REQUIRE a mouse, we meet this requirement) | Ensure keyboard alternatives exist for all actions. MNA does not receive focus in all pages. Fix this by implementing the alt text / tabindex issues identified in the application-specific Accessibility Recommendation documents. |
|   |  |   |
| SECTION 508 SUBPART D - INFO, DOCUMENTATION, SUPPORT § 1194.41  | SHORT EXPLANATION  | REQUIRED ACTION   |
| (a) Product support documentation provided to end-users shall be made available in alternate formats upon request, at no additional charge.   | Product documentation available in alternate formats free upon request   | n/a   |
| (b) End-users shall have access to a description of the accessibility and compatibility features of products in alternate formats or alternate methods upon request, at no additional charge.         | Free access for end users to accessibility descriptions and compatibility features upon request  | n/a   |
| (c) Support services for products shall accommodate the communication needs of end-users with disabilities.   | Support services should be available for end-users with disabilities (applicable only to those hosting and providing end-user support to this system)                    | n/a   |