



Rhode Island Unified Health Infrastructure Project (UHIP)

Phase 2 Detailed Test Plan

(P2–TestPlan)

Document Control Information

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Distribution of Final Document

The following people are designated recipients of the final version of this document:

State of Rhode Island		Deloitte	
Thom Guertin	Joe Simms	Brian Keane	Mary Ellen Schaefer
Donna Guido		Neil Brown	
Phil Silva		Tamil Balakrishnan	
Art Schnure		Venkatesh Gurumurthy	
George Bowen		Michael McDonough	
Deb Buffi		Geoff Silva	
Deb Florio		Shekar Atmakur	

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1 Introduction

1.1 Purpose

This document describes how the strategy and approach in the Test Management Plan (Plan 06) will be implemented and executed for the Iteration-7 functionality of the UHIP project. The document outlines the scope of the overall testing effort, the types of testing required, the test team organization, the estimated effort needed to plan and execute testing, and the roles/responsibilities of the test team. It will also describe the detailed test/use cases, test scripts, test data, schedule, test resources, planned results, and entrance/exit criteria.

1.2 Scope

The scope of testing is to validate the functionality being delivered in Iteration 7- Integrated Eligibility System (IES)

1.3 References

This subsection provides a list of all documents referenced elsewhere in this file.

Document Title	Document ID	Date	Publishing Organization	Version
Test Management Plan	Plan 06	02-27-2013	Deloitte	2.0
Rhode Island Unified Health Infrastructure Project Contract Bridging Document		01-11-2013	Deloitte	FINAL
System Architecture Design	Plan 10	05-13-2013	Deloitte	FINAL

Table 1: References

1.4 Assumptions

The following assumptions apply to the Iteration-7 Testing of the project:

- Test cases will be created based upon both requirements (Phase2- FuncReq) and design document (Phase2-FuncDesign) content.
- Representatives from EOHHS and DHS will approve entrance and exit criteria prior to moving to the next stage of testing for UAT and Production.
- New functionality outside of what is described in requirements and design document content introduced through the work request management process will require submission of a Change Request that will be processed through the change control process.
- Test data sets will be required for use in testing. This data will be determined prior to the start of testing and created in Test environment. The State will provide test data wherever possible. The testing team will fill gaps in State test data by creating other data that enables testing of application functionality.
- Interfaces will be available for testing as per the planned test schedule and stakeholders will be notified in advance of interface down time.
- State resources will be available during User Acceptance Testing (UAT) to execute test cases.
- State resources will be available to answer design questions and clarify ambiguities identified during test execution.

- State resource involvement early on in the test process is encouraged for UAT preparedness. Ways to achieve this involvement will be discussed with the State.
- Deloitte assumes that the State includes DHS, EOHHS, or a vendor fulfilling State responsibilities such as a legacy vendor.

2 Requirements Planned for Testing

This section documents the high level functional areas that will be verified as a part of the testing effort for Iteration 7 - IES as well as the location for the JAMA requirement extracts. For a detailed list of Iteration 7 requirements, refer to JAMA.

2.1 Requirements

Iteration 7:

Functional Areas:

- **Front Office:**
 - Application Registration
 - Data Collection
 - Assets
 - Expenses
 - Household Information
 - Income
 - Individual Information
 - Non-Custodial Parent
 - Non-Financial Information
 - Compliance
 - Search Inquiry
 - Miscellaneous
 - EDM/Inbox Management
 - MAGI Integration
 - SSP
 - Apply for Benefits
 - Report My Changes
 - Check Fom Benefits
 - Renew My Benefits
 - CCAP Portal
 - EARR Portal
- **Eligibility**
 - Cash (RI Works, Refugee Cash, and GPA Bridge) Eligibility
 - Medicaid Eligibility
 - SSP Eligibility
 - CCAP Eligibility
 - SNAP Eligibility
 - GPA Burial Eligibility
 - SNAP Eligibility
 - Verifications
 - CCAP Services and GPA Burial Services
 - Mass Updates
 - RIteShare
- **Benefit Management**
 - Benefit Issuance
 - Benefit Recovery
 - Provider Management
- **Interfaces**

- Federal Interfaces
- State Interfaces

- **Correspondence**

- **Reports**

- **Support Functions**
 - Alerts
 - Manage Office Resources
 - Reference Tables
 - Scheduling
 - Search Inquiry
 - Security
 - Transactional Logs
 - Work Programs
 - Case Read
 - Quality Control
 - Fraud Management

Requirements for Iteration 7 can be accessed in the UHIP JAMA tool. Within JAMA, navigate to: RI UHIP - SDLC Artifacts - Requirements

Note: This requires access to the RI UHIP JAMA tool. If you do not have access, please contact the UHIP Project Director.

3 Types of Testing

The following Test Types will be planned and executed for Phase 2 Iteration 7.

3.1 Unit Testing

3.1.1 Unit Testing Test Objective

Unit Test will be owned and executed by the Application Development Team. Unit Test is testing that focuses on verifying the smallest testable elements of the software. Unit testing is typically applied to components in the implementation model to verify that control flows and data flows are covered and function as expected. Unit Test is performed as the unit is developed to validate conformance to the documented requirements/design. Unit testing will test logical branches of functionality within the module. Unit test will also include assembly test, which ensures that related components function properly when assembled. Assembly Test is verifies proper business flows (basic, alternate and exception) and that data is passed/shared amongst modules and interfaces.

3.1.2 Unit Testing Test Readiness Criteria

The following criteria should be completed before Unit Testing can begin:

#	Item/Objective	Status / Complete	Comments
1	Completion and signoff of Requirements and Design Documents by appropriate stakeholders.		
2	The required Code components have been developed and are in the development environment.		
3	Unit Test Plan is defined.		
4	A Unit Test environment is available.		
5	A code review has been completed for impacted modules.		

3.1.3 Test Exit Criteria

The following criteria must be completed before unit testing can be considered complete:

#	Item/Objective	Status / Complete	Comments
1	Unit test cases have been documented with expected and actual results.		
2	Testcases are executed and passed.		
3	Screen level validations are working as mentioned in the FDD		
4	Severity 1, 2, and 3 defects are resolved and validated.		

3.2 Integration Testing

3.2.1 Integration Testing Test Objective

The objective of Integration Testing is to verify that the components are functioning as expected when operated individually or as a group. This involves testing the assembled individual components and testing them with other components. This testing will be conducted by the development and testing teams, with SMEs from the Functional team observing the more complex test cases to provide initial validation of the functionality.

3.3 System Integration Testing (SIT)

3.3.1 SIT Test Objective

The objective of SIT is to verify the application's end-to-end business processes as they connect with external functions. SIT confirms that all code modules work as specified, and that the system as a whole performs adequately on the platform on which it will be deployed. SIT is a user based approach for validating the functionality and usability of the product and verifies the readiness for entrance into User Acceptance Testing.

SIT will utilize both new test data created as well as converted data as made available to the test team post mock conversions. The SIT team will test with third parties based on third party readiness and availability, which may occur outside of the defined SIT timeframe, but will occur as feasible prior to UAT testing with the third party. The SIT team will also complete accessibility testing. The SIT team will also complete accessibility and compliance testing.

3.3.2 SIT Test Readiness Criteria

The following criteria must be completed before SIT can begin:

#	Item/Objective	Status / Complete	Comments
1	Exit criteria for unit testing has been met.		
2	Software is available for SIT.		
3	An initial smoke test of the SIT environment has been completed, confirming environment readiness.		
4	Test scenarios, test cases, and test steps have been completed.		
5	Access to the SIT environment and necessary user setup has been completed.		

Table 2: Test Readiness Criteria

3.3.3 SIT Test Exit Criteria

The following criteria must be completed before SIT can be considered complete:

#	Item/Objective	Status / Complete	Comments
1	Mutually agreed upon test cases have been executed and passed (or deferred to a future release, if approved by		

#	Item/Objective	Status / Complete	Comments
	project leadership)		
2	Mutually agreed upon Severity 1-Critical or Priority 1-Critical work requests identified 15 days before the close of SIT have been resolved and/or other remedy action is identified		
3	Mutually agreed upon Severity 2-High or Priority 2-High work requests not fixed during testing have been reviewed and deferred by the UHIP leadership team (i.e. acceptable to begin UAT with these work requests outstanding).		
4	UHIP functionality delivered for Iteration 7 has been validated and signed off by the Deloitte Testing Team		

Table 3: Test Exit Criteria

To allow the State to gauge SIT progress and plan for the start of UAT, Deloitte will report progress towards SIT Exit Criteria with the following timeframe and goals:

- 1) Thirty days prior to the end of SIT: 90% of test cases executed with a 75% pass rate
- 2) Fifteen days before the end of SIT: 95% of test cases executed with a 85% pass rate
- 3) Five days before the end of SIT: 100% of test cases executed with a 95% pass rate

3.4 Performance Testing

3.4.1 Performance Testing Test Objective

The objective of Performance Testing is to verify that system response time meets or exceeds agreed upon Service Level Agreements (SLAs) for functional units and transactions under average or peak load.

Performance Testing is conducted to:

- Measure the response time of each business transaction when maximum numbers of users are accessing the application during peak business hours.
- Proactively identify bottlenecks in the application with varying load to determine if the system can sustain the anticipated live load without performance degradation.
- Establish a baseline for future testing, to measure improvements and degradations in performance of subsequent iterations
- Establish a baseline to support future performance tuning efforts
- Measure compliance with UHIP application performance goals and requirements, as stated in Appendix S - Section 7.4 of the Deloitte-Rhode Island Bridging Document. For Phase 2, there is one clarification to the SLAs as defined in Appendix S - Section 7.4 of the Deloitte-Rhode Island Bridging Document as follows:
 - For real time transactions, the Bridging documents indicates that for “Transactions that require interface with a third party application or COTS application”, the SLA specification is a “Response time will be 10 seconds or less for 99% of the transactions on average.” For Phase 2 Iteration 7, for Eligibility determinations using Oracle Policy Automation (OPA), the response time will be met for a case with the following characteristics: 1 programs, 3

household members, and 1 month. Each addition by 1 to the household member count, programs, or months for which the business rules are executed will increase the SLA response time threshold by 5 seconds.

- Worker portal performance testing will be conducted assuming a peak volume of 300 concurrent users.
- Self service performance testing will be conducted assuming a peak volume of 750 concurrent users.

3.4.2 Performance Testing Test Readiness Criteria

The following criteria must be completed before Performance Testing can begin:

#	Item/Objective	Status / Complete	Comments
1	Software is ready and available for Performance Testing		
2	Performance Testing environment readiness has been confirmed.		
3	Test scenarios, test cases, and test steps have been completed.		
4	Test data is available.		
5	Access to the Performance environment and necessary user setup has been completed.		
6	Access has been given to the performance testing team for debugging and also for starting/stopping the servers and load generators.		

Table 4: Test Readiness Criteria

3.4.3 Performance Testing Test Exit Criteria

The following criteria must be completed before Performance Testing can be considered complete:

#	Item/Objective	Status / Complete	Comments
1	Mutually agreed upon test cases have been executed and passed (or deferred to a future release, if approved by project leadership)		
2	Mutually agreed upon Severity 1-Critical or Priority 1-Critical work requests identified 15 days before the planned end of Performance Test have been tested and closed, and for anything identified within 15 days of the planned Performance Test need to be assessed for production.		
3	Mutually agreed upon Severity 2-High or Priority 2-High work requests not fixed during testing have been reviewed and deferred by the UHIP leadership		

#	Item/Objective	Status / Complete	Comments
	team.		
4	UHIP system performance for Iteration 7 has been validated and signed off by the Deloitte Testing Team.		

Table 5: Test Exit Criteria

3.5 Stress Testing

3.5.1 Stress Testing Test Objective

The objective of Stress Testing is to help determine the stability of the system by testing beyond the normal operating capacity. This type of testing verifies a system’s performance, workload, sizing and response time.

It differs from Performance Testing in that the goal is to find the saturation point (i.e. the maximum number of simultaneous users beyond which system starts throwing errors) of the system and is not necessarily concerned with SLAs during these tests. In Phase 2, Stress Testing will be conducted concurrently and in the same environment as Performance Testing. The resulting saturation point will be captured in JAMA after each test run and also documented in the performance test section of status reports, for use in capacity planning and comparisons to the saturation point of future releases.

3.5.2 Stress Testing Test Readiness Criteria

The following criteria must be completed before Stress Testing can begin:

#	Item/Objective	Status / Complete	Comments
1	Software is ready and available for Stress Testing		
2	Performance Testing environment readiness has been confirmed		
3	Test scenarios, test cases, and test steps have been completed		
4	Test data is available		
5	Access to the Performance environment and necessary user setup has been completed.		

Table 6: Test Readiness Criteria

3.5.3 Stress Testing Test Exit Criteria

The following criteria must be completed before Stress Testing can be considered complete:

#	Item/Objective	Status / Complete	Comments
1	Stress testing has been executed and the results shared with the State		

Table 7: Test Exit Criteria

3.6 User Acceptance Testing (UAT)

3.6.1 UAT Test Objective

The objective of UAT is to validate the system’s ability to support the business and the end user/customer.

UAT’s prime purpose is to demonstrate that the system is fit for use in the business. The UAT plan provides the outline for this type of testing and the steps by which the requisite activities will be completed. The IV&V vendor will be responsible for coordination, planning, and managing the execution of UAT with the State. Deloitte will provide State support during UAT.

UAT will utilize both new test data created as well as converted data as made available to the test team post mock conversions.

3.6.2 UAT Test Readiness Criteria

The following criteria must be completed before UAT can begin:

#	Item/Objective	Status / Complete	Comments
1	Software is ready and available for UAT		
2	SIT exit criteria has been met and/or State has agreed to defer open SIT items and proceed with UAT		
3	UAT environment readiness has been confirmed		
4	Resources have been identified and prepped		
5	Test scenarios, test cases, and test steps have been completed		
6	Test data is available		
7	Access to the UAT environment and necessary user setup has been completed.		

Table 8: Test Readiness Criteria

3.6.3 UAT Test Exit Criteria

The following criteria must be completed before UAT can be considered complete:

#	Item/Objective	Status / Complete	Comments
1	Test cases have been executed and passed (or deferred to a future release, if approved by State)		
2	Mutually agreed upon Severity 1-Critical or Priority 1-Critical work requests identified 30 days before the planned end of UAT have been tested and closed. Anything identified within 30		

#	Item/Objective	Status / Complete	Comments
	days of the planned end of UAT will be assessed during pilot and for production readiness (including other alternative options) to maintain the stability and integrity of the application		
3	Severity 2-High or Priority 2-High work requests not fixed during UAT have been reviewed and deferred by the State (i.e. acceptable to launch with these work requests outstanding).		
4	UHIP functionality delivered for Iteration 7 has been validated and signed off by the State from a UAT perspective in order to move into Pilot		

Table 9: Test Exit Criteria

3.7 Regression Testing

3.7.1 Regression Testing Test Objective

Regression Testing consists of the selective re-testing of a system or component to verify that any solution modifications have not caused unintended effects as result of work requests or change requests and that the system or component still complies with its specified requirements. The test team will select test cases both related to the change as well as test cases not related to the change to ensure unchanged functionality continues to work as intended.

During the SIT phase, Regression Testing is performed after every iteration to ensure that there is proper coverage of the modules impacted with change and also a certain percentage of the functionally critical modules from the prior iteration. At the end of the final SIT Iteration, two weeks of dedicated regression testing will be completed. In addition, after the Phase 1 October release, two weeks of dedicated regression testing will be performed on the Iteration 7 codebase merged with the Phase 1 October release functionality.

During UAT, the State can also identify regression test scenarios to run throughout the UAT phase.

Regression testing conducted in parallel with System Integration Testing (SIT) will carry the same readiness and exit criteria as SIT. Entrance and exit criteria for regression testing after the Phase 1 October release (inclusive of Carrier Integration testing) is as follows:

3.7.2 Regression Testing Test Readiness Criteria

The following criteria must be completed before Regression Testing for the Phase 1 October release can begin:

#	Item/Objective	Status / Complete	Comments
1	Phase 1 October release has been implemented.		
2	An initial test of the SIT environment has been completed, confirming environment readiness		

#	Item/Objective	Status / Complete	Comments
3	Test scenarios, test cases, and test steps have been completed		
4	Test data, including content, is available		
5	Users and access set up - Appropriate profiles and security set up complete in the testing environment		

3.7.3 Regression Testing Test Exit Criteria

The following criteria must be completed before Regression Testing on the Phase 1 October release can be considered complete:

#	Item/Objective	Status / Complete	Comments
1	Mutually agreed upon test cases have been executed and passed (or deferred to a future release, if approved by project leadership)		
2	Mutually agreed upon Severity 1-Critical or Priority 1-Critical work requests identified 15 days before the end of SIT on the Phase 1 October release functionality have been resolved and/or other remedy action is identified		
3	Mutually agreed upon Severity 2-High or Priority 2-High work requests not fixed during testing have been reviewed and deferred by the UHIP leadership team (i.e. acceptable to begin UAT on Phase 1 October release functionality with these work requests outstanding).		
4	UHIP functionality for the Phase 1 October release that has been merged with the Phase 2 Iteration Iteration 7 codebase has been validated and signed off by the Deloitte Testing Team		

3.8 Security Testing

3.8.1 Security Testing Test Objective

The objective of the security testing cycle is to determine that only authorized users, at different levels, can be granted access to the system as defined in the security requirements. The security for components of UHIP will be tested to verify that only authorized users have access to the appropriate business divisions and/or levels, and no unplanned nor unauthorized users have access to the system. Testing will include positive and negative testing.

The security testing timeline is contingent on the completion of the security roles definition and access with the State and will be defined in conjunction with the State based on the completion of the security definitions.

3.9 Usability Testing

3.9.1 Usability Testing Test Objective

Usability testing for Phase 2 Iteration 7 will consist of the following and will be facilitated by Deloitte and DHS:

- Worker Portal Usability Testing: One on one dedicated test sessions will be conducted with a limited number of end users to gain feedback on the usability of the worker portal application. The testing will focus on the Application Registration, Data Collection, and Eligibility modules.
- Client Notice Usability Testing: One on one dedicated test sessions will be conducted with a limited number of client volunteers from the DHS local office in order to solicit feedback on notice content. The following high visibility, high volume notices will be tested:
 - Notice of Case Action
 - Request for Documentation
 - Redetermination Form

Upon completion of Usability Testing, results will be shared with the State and any next steps discussed and mutually agreed upon. The test timeline and approach for Usability Testing is under discussion with the State and will occur at a mutually agreed upon timeframe.

4 Test Environments

This section identifies the overall set of logical environments supporting the testing teams for Phase 2 Iteration 7 Testing. Refer to the architecture documentation for more information and diagrams of each logical environment that is established.

The table summarizes the purpose of each logical environment. Each logical environment may consist of multiple physical environments to support the various activities mentioned. The order of environments does not imply the order in which they are used from a SDLC perspective, nor are all environments used as part of each SDLC phase.

Physical Environment	Logical Environment	Environment Owner	Type of Testing Supported
Development	DEV	Development Team	Integration Testing; Unit Testing
Development	CONV	Conversion Team	Conversion Testing
Test	System Test	Testing Team	System Testing; Regression Testing; Security Testing
Test	System Test Time Travel	Testing Team	System Testing; Regression Testing
Test	Conversion	Conversion Team	Conversion Testing
Certification	UAT	UAT Team	User Acceptance Testing; Regression Testing; Security Testing
Certification	UAT Time Travel	UAT Team	User Acceptance Testing; Regression Testing;
Certification	Pilot	Operations	N/A
Certification	Training	Training Team	N/A
Performance	Performance	Testing Team	Load/Performance/Stress Testing
Production	Production	Operations	N/A
Immediate Release	Immediate Release	Operations	N/A
Disaster Recovery	Disaster Recovery	Operations	N/A

Table 10: Test Environments

5 Test Schedule

The table below lists the time frame for executing each test phase.

Test Type	Start Date	End Date
SIT – Iteration 1	06/23/2014	07/25/2014
SIT – Iteration 2	07/28/2014	08/15/2014
SIT – Iteration 3	08/18/2014	10/17/2014
SIT – Regression Test	10/20/2014	10/31/2014
SIT – Phase 1 Regression Test	11/3/2014	12/19/2014
Performance Testing	11/17/2014	12/26/2014
UAT	11/10/2014	03/06/2015

Table 11: Test Schedule

Note: Test dates are in alignment with the proposed schedule via the submission of Change Request 133 (version 4) on 07/17/2014. The testing schedule is contingent on State approval of this change request.

The figure below displays the high level testing timeline which includes test planning timelines.

Test Timeline

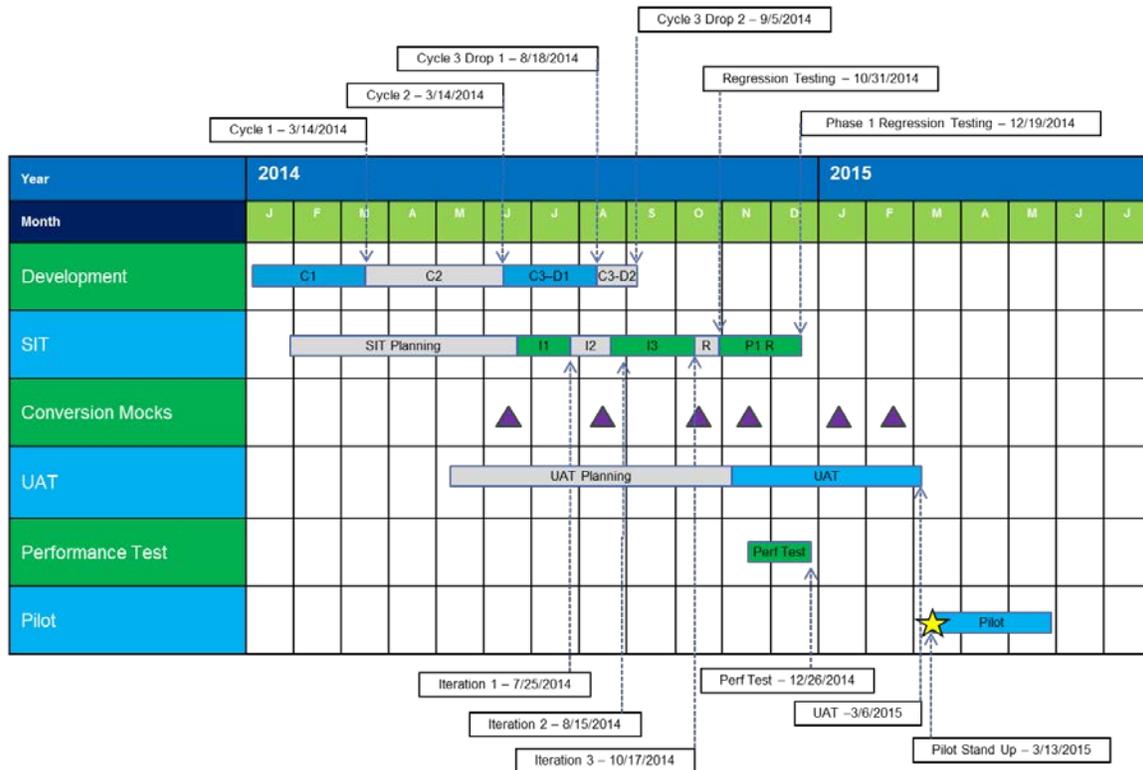


Figure 1: Iteration 7 Testing Timeline

6 Test Team

6.1 Roles and Responsibilities

The table below outlines the roles and responsibilities of the UHIP testing team.

Test Team Organization	
Role Title	Description of primary responsibilities within the process
Deloitte Test Manager	<ul style="list-style-type: none"> • Manages, directs, and coordinates System Integration Test and Performance Testing • Supports User Acceptance Test execution and coordinates with IV&V vendor and the State • Develops the overall test strategy and test plan, and monitors progress against the plan • Coordinates activities across teams to make sure testing types start on schedule, make progress per the testing schedule, and assist in determining that entry/exit criteria are met • With the assistance of the State, coordinates the testing of interfaces with external system stakeholders • Determines that the integrity of the testing process is maintained through the enforcement of release and change management processes and adherence to testing methodology and plans • Reviews the test scenarios against business requirements and standards • Authors System Integration and Performance Testing Phase work products • Drives test planning • Provides coordination between the Deloitte testing teams and other support teams such as the Development Teams and Functional Teams • Reviews test cases • Oversees test execution and work request resolution • Supports Issue resolution activities
State Test Lead(s)	<ul style="list-style-type: none"> • Assist in the development of the User Acceptance Testing Plan • Assist in the development of User Acceptance Test Cases • Coordinates reviews of UAT test cases • Coordinates reviews of UAT test results • Responsible for approving UAT readiness and exit criteria • Supports Integration/System Testing execution • Provide resources to assist with the development of UAT test cases • Provide resources for UAT test case execution • Coordinate resources needed for testing interfaces and web portals, including non-Department resources. • Assist with resolving issues during testing phases

Test Team Organization	
Role Title	Description of primary responsibilities within the process
State Tester	<ul style="list-style-type: none"> • Defines UAT test scenarios • Writes detailed test cases for UAT • Executes the test cases for each test type • Detects and logs work requests with all necessary information for advanced troubleshooting • Works closely with Business Leads and Developers to resolve and/or retest work request/s • Adheres to standards and process as defined by the State Test Lead and UAT Test Manager
Deloitte Test Lead	<ul style="list-style-type: none"> • Maintains standards and processes around test case creation and test case execution within their area • Performs review of test cases • Manages execution on of each test activity within their area • Provides daily summary reports of test execution and work request resolution to the Deloitte Test Manager
Deloitte Tester	<ul style="list-style-type: none"> • Writes detailed test cases for each test activity and completes traceability to requirements • Executes the test cases for each test type • Detects and logs work requests with necessary information for advanced troubleshooting • Works closely with Business Leads and Developers to resolve and/or retest work request/s • Adheres to standards and process as defined by the Deloitte Test Manager
State Business SME	<ul style="list-style-type: none"> • Review and provide input on business requirements • Review and provide input on business processes and the associated elements required in the Design • Review and validate deliverables and artifacts • Provide written approval of the deliverable • Participate in UAT
UAT Test Manager (IV&V)	<ul style="list-style-type: none"> • Manages, directs, and coordinates User Acceptance Test • Develops the overall test strategy and test plan, and monitors progress against the plan • Coordinates activities across teams to make sure testing types start on schedule, make progress per the testing schedule, and assist in determining that entry/exit criteria are met • With the assistance of the State, coordinates the testing of interfaces with external system stakeholders • Drives test planning for UAT • Coordinates the development of the UAT test scenarios and test cases • Reviews test cases for UAT • Oversees test execution for UAT • Assists State Test Lead(s) in assessing the UAT readiness and exit criteria • Supports issue resolution activities

Test Team Organization	
Role Title	Description of primary responsibilities within the process
UAT Test Analyst (IV&V)	<ul style="list-style-type: none"> • Supports the execution of the test cases for UAT • Supports entering work requests with all necessary information for advanced troubleshooting • Works closely with Business Leads and Developers to resolve and/or retest work requests • Adheres to standards and process as defined by the UAT Test Manager

Table 12: Roles and Responsibilities

6.2 Resource Assumptions

- Resources are available during normal business hours for the duration of the testing activities
- Resources have reviewed the functional design documents and understand the expected behavior of the application
- Resources possess the technical knowledge to read and understand the design documents, execute test cases (where required), and speak to the validity of work requests.
- The State will provide sufficient tester resources during UAT to execute planned test cases within the allotted timeframe

7 Test Scenario and Test Case Development

7.1 Approach

The purpose of test case development is to detail test scenarios, develop step by step test cases, prepare the finalized work products for submission and signoff, and identify needed data to support test execution.

The test cases developed for Iteration 7 testing must be designed to verify and validate the following:

- Individual components of a system function correctly when passing data, information, and screen control.
- The systems interface with other systems, including external third-party systems, in a production-like environment.
- Application security and privacy requirements are met.
- New builds to an environment are ready (or not ready) for further testing.
- User needs, requirements, and business processes are conducted to determine whether a system satisfies the acceptance criteria. They also enable the user to determine whether to accept the system.
- Changes have not adversely affected previously verified functional components.
- Application performance metrics are evaluated to determine if they meet agreed upon Service Level Agreements (SLAs) for the Project.

7.2 Planning & Preparation

Test planning outlines the high level objectives and approach to testing based on a review of the enterprise test standards and associated UHIP deliverables, such as the requirements documentation and design documentation. This section also provides the steps necessary to accomplish test case development and execution activities

Test Planning includes the following activities:

- Identify scope – what functional and non-functional requirements will be included in the release and the detailed requirements in scope; in addition, review the changed and affected systems and applications.
- Identify criteria for test readiness – documenting the test entry criteria for each level of testing (for example, System, Integration, User Acceptance, etc.). Test entry criteria include, but are not limited to, the entry criteria for a particular test type.
- Review the established test entry criteria for each level with key stakeholders and determine if updates are needed.
- Establish criteria for test exit – the test exit criteria are mutually agreed to requirements to determine if a particular test type is complete. The criteria can refer to a percentage of test cases run and passed, the number or priority of outstanding errors (also called work requests), or the criticality of failed test cases.
- Determining test estimation – taking into consideration the number and complexity of in-scope requirements and test cases, estimating the level of effort required to plan and execute each test type.
- Set the test schedule – document the test schedule for each test type. The test schedule includes, but is not limited to, expected milestones, test execution completion, execution order, and test owner.
- Define roles/responsibilities – document the structure and number of roles needed to plan and execute test activities.
- Conduct review of the test plan – validate that the approach and plan created meets expectations.

7.3 Test Scenario and Test Case Writing

Test case development includes the following activities:

- Design test scenarios – A scenario is a high-level description of the test case and the expected result. It is not step-by-step instructions, but gives enough detail to allow functional, technical, and/or business subject matter experts (SMEs) to validate that test coverage will be achieved.
- The approach for test case scenarios varies from track to track. For example, in data collection, we would ensure that all the possible scenarios in an LUW are covered. In Eligibility, the test scenarios are authored at a program level covering household composition, financials, resources etc.
- Review test scenarios – Review the test scenarios with appropriate stakeholders for consistency, applicability, and to determine if it is directionally accurate.
- Detail pre/post conditions – Document the requisite preconditions prior to executing Test Cases and any post conditions required to be performed post execution. Pre/post conditions could also be a validation to determine if that the appropriate data has been provided to begin the scenario or that necessary data has been passed to complete the scenario.
- Document test data set – Based on the detailed definition, the required test data should be determined for each test case. When utilizing a test data request process, the appropriate forms should be filled out. Denote any Personal Health Information (PHI) or Personal Identifying Information (PII) and determine if it is properly scrubbed.
- Create test steps – Steps should provide explicit instructions for any manual and automated actions (for example, user interface navigation, data entry, job execution) and what to observe.
- Document expected results – For each step in the test case, document the expected outcome related to its completion. This should be as prescriptive as possible (for example, “The status field should read ‘complete.’ ”).
- Review the test cases – Review the test cases with appropriate stakeholders from the State and/or Deloitte for consistency, applicability, and to determine if it is directionally accurate.
- Import the test cases into the test management tool - Import test cases from import templates into the test management tool if applicable for the project. This is typically done prior to execution for easier revision and management. Once test execution begins, any edits to a test case are made directly within the tool.
- Prepare test execution records – A test execution record includes the selection, prioritization, and organization of test cases into test cycles and assignment to each tester.
- Update the Requirements Traceability Matrix (RTM) – Update the Requirements Traceability Matrix to reflect the additional Test Case(s). Additionally, validate the existing traceability remains accurate.

Test cases can be accessed in JAMA). This requires access to the RI UHIP JAMA tool. If you do not have access, please contact Donna Guido, UHIP Project Director.

7.4 Test Case Status

Test cases are maintained within JAMA. Each test case is executed by a tester within a test run within JAMA. Each test case within a test run will contain one of the following statuses:

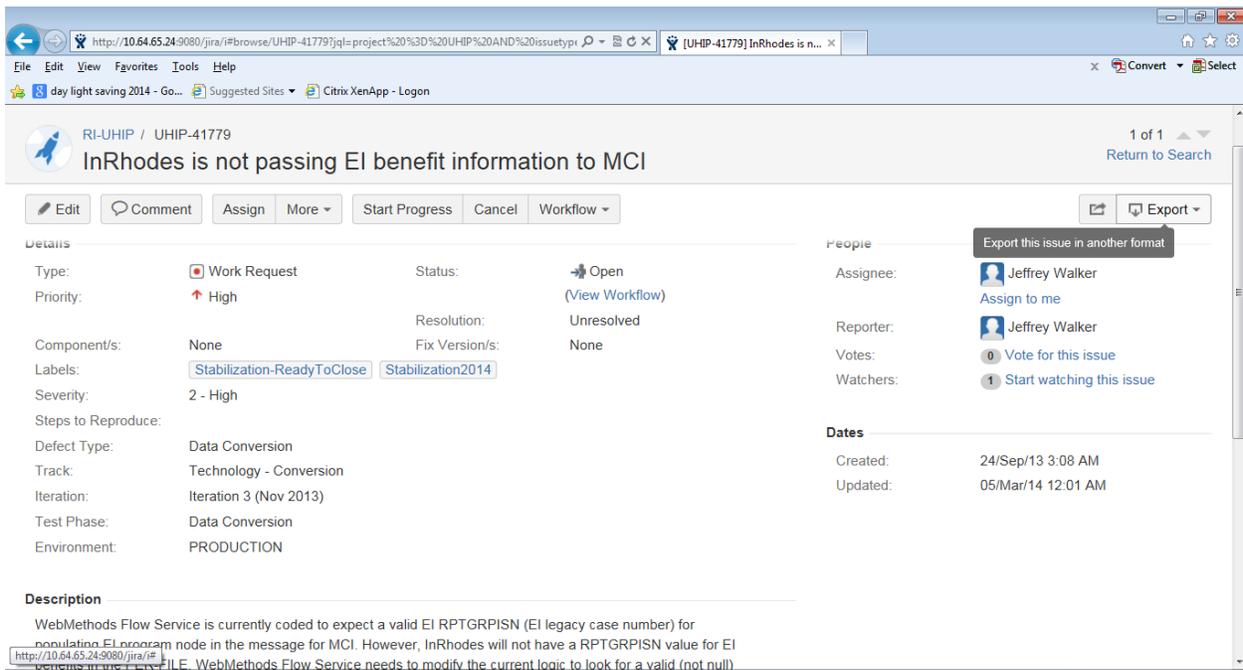
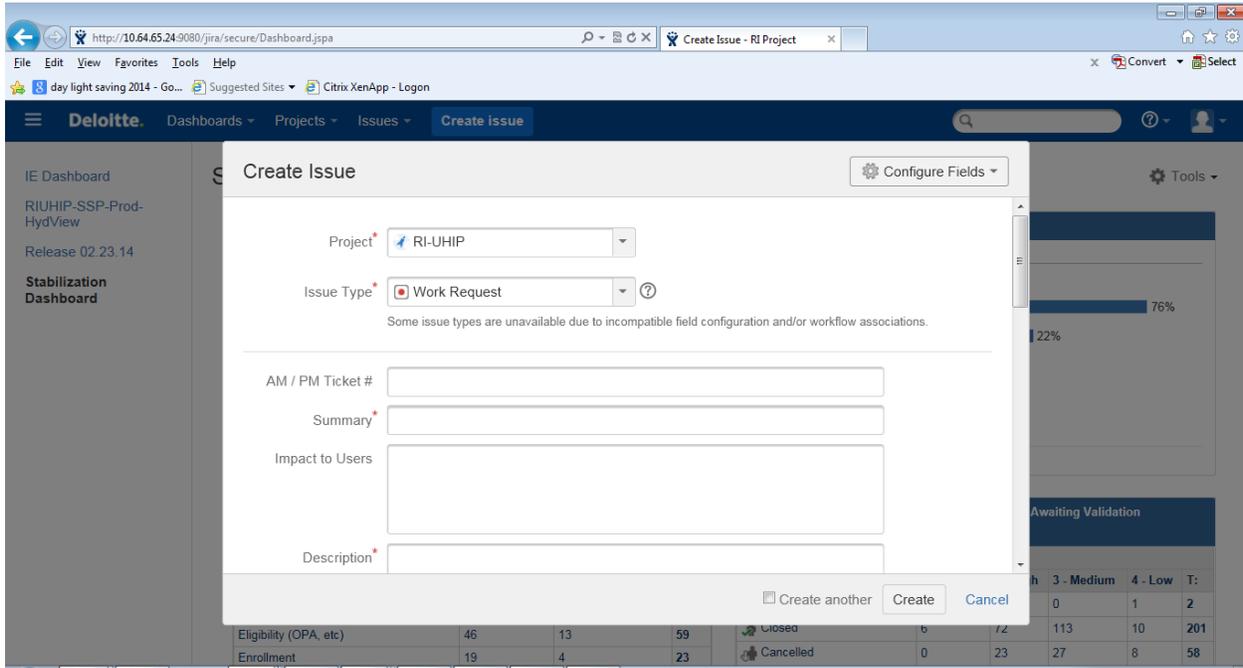
- Passed: Each step within the test case was executed and no associated Severity 1 or 2 work requests were logged.
- Failed: Test case was executed and a Severity 1 or 2 work request was logged.
- Blocked: Test execution has started but cannot be completed for reasons such as functionality not being available.

- In Progress: Test case execution has started but a final result (Passed, Failed, or Blocked) has not been achieved,
- Not Run: Test case execution has not started.

To further differentiate Passed cases, an attribute exists on each test case to detail whether the case passed with errors. If an item passed with errors, this indicates that the case is associated with a Medium or Low severity work request.

8 Work Request Management

The work request management process provides a standard approach for managing work requests detected during testing. The work request management process will serve as a means to identify, report, triage, fix, and close work requests. JIRA will be used as defect tracking tool. The tool allows users to capture work requests, issues, and tasks. Below are screenshots of the work requests captured in JIRA



Work requests can be identified and reported in any of the following cases:

- Deviation from business requirements, technical requirements, or functional design document (FDD).
- Deviation from expected results

8.1 Work Request Owner

Work requests will be assigned to the appropriate resource for analysis, resolution, clarification, retest, and closure.

8.2 Work Request Severity

Work requests will have one of four severities – Critical, High, Medium, and Low. Severity will be assigned according to the following criteria:

Severity	Description
1 – CRITICAL	Very severe. There is a severe problem: the application is unavailable, a major component is broken with no work-around, there is a data integrity issue related to security or regulatory non-compliance.
2 – HIGH	Significant. There is a significant problem (e.g. component unavailable, incorrect data being stored in the database), but a work-around exists. The issue should be fixed prior to launch, but the launch can proceed with leadership approval.
3 – MEDIUM	Result is not as expected. A non-critical component is unavailable or the system is not functioning as designed (e.g. incorrect calculations). The Work Request will impact on the overall quality of the release, and should be fixed, but does not prevent implementation from moving forward.
4 – LOW	Minor issue. The issue is cosmetic, such as a misspelling or a misaligned field on a screen. This could also be a documentation issue, where a clarification is needed in the functional or technical design documents.

Table 13: Work Request Severity Guidelines

8.3 Work Request Priority

Work requests will have one of three priorities severities – Critical, High, and Medium. Priority will be assigned according to the following criteria:

Priority	Description
1 – CRITICAL	The work request has a major impact on the public, such as incorrect premiums displayed, inability to access the application, or non-compliance with legal requirements.
2 – HIGH	Work request has a major impact on internal (State) users and no work-around exists.
3 – MEDIUM	Work request has a moderate impact on the public, such as a screen rendering incorrectly, long wait times, or non-critical data not appearing or inaccurate.

Table 14: Work Request Priority Guidelines

8.4 Work Request Triage

The Testing Team will be responsible for logging work requests. All logged work requests will be analyzed and assigned to the appropriate resource for resolution. The Test Lead and or Test Manager will review work requests and makes sure that the tester has provided sufficient information, and that the

assigned severity and priority align with agreed-upon definitions. The Test Manager will schedule triage calls on as-needed basis during test execution if clarification/discussion is required on work requests.

- Triage calls will be conducted by the Test Manager and will include representatives from the development team, functional teams, the State, and IV&V vendor as needed
- During triage calls, work requests requiring clarification/discussion will be discussed, including the assigned severity and priority.
- The triage call will be used to prioritize work requests for the development team based on priority and severity.
- Testers will log work requests in JAMA (which will be forwarded to JIRA), or they may log work requests in JIRA directly. The status of the work requests will be set to Open and the work requests will be assigned to the general Work Request queue.
- During UAT, the State Test Lead(s) will assist the Testing Team in assigning the appropriate severity and priority to work requests, taking into account the severity and priority definitions.
- Prioritized work requests will be assigned to the development team and/or individual developers.
- Once the work request is fixed and validated by the development team in a unit test, the development owner will assign it back to the testing team. A tester will then retest to the work request to confirm that the issue has been resolved.
- Based on retest results, the tester will either reject the fix, which will send it back into the Work Request queue, or close the work request.

Work Request Triage Team participants:

- Testing Team (representatives)
- Development Team (representatives)
- Functional Team (representatives)
- Deloitte Test Lead
- IV&V Test Manager – during UAT
- State Test Lead(s) – during UAT
- State Business SME(s) - during UAT

8.5 Work Request Escalation

Work requests identified during testing phases have a target time to acknowledge and a target turnaround time, based on their severity. Time to acknowledge is the time it takes the development team to review the work request and provide an estimated fix date. Turnaround time is the time it takes to deliver a fix into the Test environment. The table below specifies the target resolution times for each work request severity. Note that severity, and not priority, determines the turnaround time for a work request.

Severity	Acknowledgement and Resolution
1 – CRITICAL	<ul style="list-style-type: none">• Issue acknowledged within the day• 48 hours to provide estimated date for delivery of resolution after issue
2 – HIGH	<ul style="list-style-type: none">• Issue acknowledged within the day• 72 hours to provide estimated date for delivery of resolution after issue
3 – MEDIUM	<ul style="list-style-type: none">• Prioritized based on Critical and High work requests
4 – LOW	<ul style="list-style-type: none">• Prioritized based on Critical, High, and Medium work requests

Table 15: Work Request Acknowledgement and Resolution

8.6 Work Request Management Process

The diagram below illustrates the lifecycle of a work request.

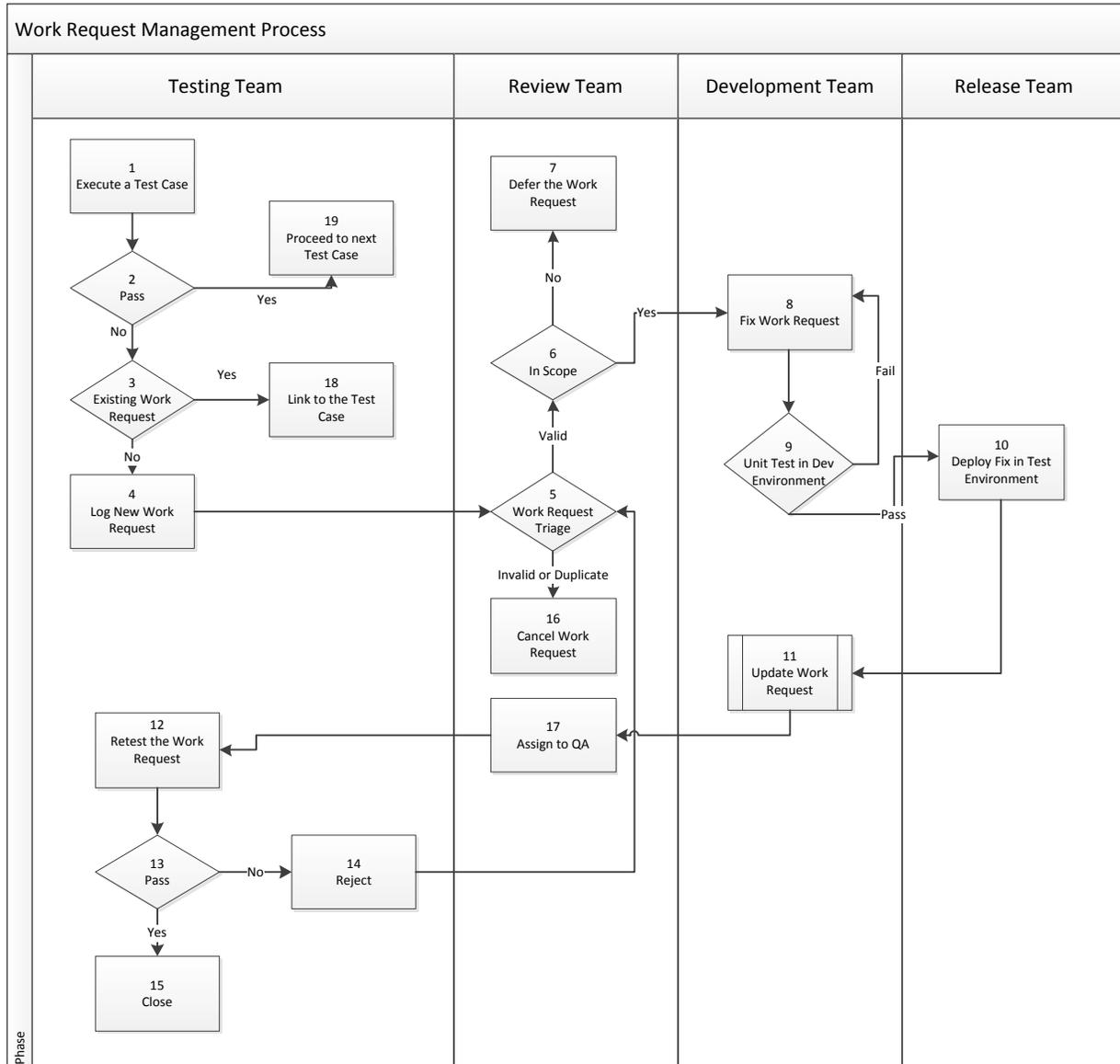


Figure 2: Work Request Life Cycle

9 Status Reports

During the testing period, several reports are created regularly to track, manage and communicate the progress and status of testing. These reports include summary and detailed information of test scripts executed and work requests discovered during testing. The reports are generated based on the data elements captured and maintained in JAMA and JIRA.

9.1 Regular Reports

Status reports are run on a regular basis to provide an overall status of test scripts run and work requests logged in each Testing cycle. Status reports provide a current status as of a point in time for measurement against the schedule.

9.1.1 Daily Status Report

The Daily Status Report for a phase such as SIT or UAT will provide a high level summary of test execution and work requests identified. It will describe and risks or issues the testers are facing and mitigation strategies if they exist.

Below is a sample of a daily status report:



RI UHIP Iteration 2
System Testing Daily

9.1.2 End of Phase Status Report

The End of Phase Status Report for a phase such as SIT or UAT is very similar to the Daily Status Reports. It will provide a high level summary of test execution and work requests identified. It will be the final report of the last cycle for that phase and will contain the summary slide from previous cycles of that phase. In addition, the End of Phase Status Report for UAT will also include a refresh of the RTM to map requirements to test cases.

Below is a sample of an end of phase status report:



RI UHIP Iteration 1
System Testing Daily

9.2 Other Reports

Typical test management tools such as JIRA and JAMA provide capabilities to generate reports to monitor further potential areas of interest such as work request aging, work request details, work requests logged per SME/tester, work requests cancelled per SME/tester, and others. Reports such as these may be created by anyone with access on an ad hoc basis during the testing phase.

10 Test Support Infrastructure

10.1 Test Tools

The table below outlines the tools that will be leveraged by the testing team during Phase 2. A description and the type of testing done while utilizing the tool is also described.

Tool	Tool Description
JAMA Contour	Test scripts are maintained in a test case repository and are subject to version control. Test cases can be scheduled into plans for execution based on what the development team delivers in the code release. Additionally Contour allows test cases to be scheduled into multiple cycles to validate defect fixes and regression testing.
JIRA	JIRA provides highly configurable dashboards making development and defect management an efficient, easily managed process. At a glance, users can see the progress of development and the status of defects. Automated e-mail notifications can be configured as tasks are assigned to individuals.
Apache JMeter	Apache JMeter is open source software, a 100% pure Java desktop application designed to (load) test functional behavior and measure performance. It was originally designed for testing Web Applications but has since expanded to other test functions. Apache JMeter will be used to test performance both on static and dynamic resources (files, servlets, Perl scripts, Java Objects, Databases and Queries, and FTP Servers). It will simulate a heavy load on a server, network or object to test its strength or to analyze overall performance under different load types
Selenium	Selenium is an open source, browser automation tool that creates robust, browser-based regression test automation. The testing teams will leverage Selenium where applicable across the test types.
JAWS	JAWS is a computer screen reader program for Microsoft Windows that allows blind and visually impaired users to read the screen either with a text-to-speech output or by a Refreshable Braille display. The testing teams will leverage JAWS to verify that UHIP adheres to federal laws, Rhode Island state statutes, and international guidelines that have been promulgated to help determine that persons with disabilities have access to electronic information technology.
WAVE	Used to determine 508 compliance of UHIP

Tool	Description of Use	Test Types Utilizing Tool
ALM JAMA Contour	Test Case Management <ul style="list-style-type: none"> • Create and manage test cases, test plans, and test execution • Create and manage requirements and the requirement traceability matrix 	<ul style="list-style-type: none"> • System Integration Testing • Performance Testing • User Acceptance Testing • Regression Testing
ALM JIRA	Defect Management <ul style="list-style-type: none"> • Log and track work requests • Manage tasks and work items • Track all risks/issues 	<ul style="list-style-type: none"> • System Integration Testing • Performance Testing • User Acceptance Testing • Regression Testing
JMeter v2.9	Stress and Performance Test Execution <ul style="list-style-type: none"> • Develop Performance testing scripts and Execution 	<ul style="list-style-type: none"> • Performance Testing • Stress Testing
Selenium	Automated Testing <ul style="list-style-type: none"> • Create and manage automated test cases, automated test plans, and automated test execution • Automate functional and regression testing • Tool to be utilized during later stages of testing when the application is stable and automated scripts do not require updates based on ongoing application changes 	<ul style="list-style-type: none"> • Regression Testing
JAWS	Accessibility Testing <ul style="list-style-type: none"> • Used to verify accessibility of UHIP for visually impaired users 	<ul style="list-style-type: none"> • System Integration Testing
WAVE	Compliance Testing <ul style="list-style-type: none"> • Used to determine 508 compliance of UHIP 	<ul style="list-style-type: none"> • System Integration Testing

Table 16: Test Tools Summary

11 Risks, Dependencies, and Constraints

The potential risks and their mitigation strategies are listed below:

Risk	Mitigation Strategy
Changes to the FDDs will require rewrite or rework of test cases	Keep updating the test cases with section numbers and other changes when required so that the test case is as close to the FDD description as possible
State submits functional clarifications during testing that require a code change.	Ensure that clarifications that require a code change after the functional design documents have been approved are tracked as change requests, and that the level of effort is understood before embarking on a change.
Insufficient State resources available to execute user testing.	<p>IV&V Vendor will coordinate with State EOHHS and DHS teams to identify resources that can be available during the user testing periods.</p> <p>The testing team will get the State's team up to speed on testing and validating the application early into the testing cycles.</p>

Table 17: Risks

The dependencies and potential impact to the testing effort are listed below:

Dependency Between	Potential Impact of Dependency
Test Environments and Test Execution	Test cases cannot be executed if the test environments are not ready. Problems with environment readiness may delay the start of testing.
UAT and State Resources for Testing	UAT can only proceed when State testers are available to execute test cases. Lack of availability may reduce the number of test cases that can be executed during UAT, and hence reduce the scope of coverage of the functionality.
Test Data and Test Execution	If the state is unable to provide data (i.e. plan or converted), testing teams will need to create mock data that may be not be representative of all production scenarios.
External Stakeholders and Interface Testing	In order to test interfaces end-to-end, external stakeholders must have necessary development complete (if applicable) and be ready and available to test. Without third party involvement, interface testing cannot be completed end to end.

Table 18: Dependency Impact

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