Research Administration Management System (RAMS) Sustainment Release R1605

Test Evaluation



Department of Veterans Affairs

**October 2016**

Version 1.1

Revision History

**Note**: The revision history cycle begins once changes or enhancements are requested after the Communications Plan has been baselined.

| Date | Version | Description | Author |
| --- | --- | --- | --- |
| 10/17/2016 | 1.1 | Updated based on feedback | Booz Allen Hamilton |
| 10/13/2016 | 1.0 | Release R1605 Test Evaluation Summary Report | Booz Allen Hamilton |

Artifact Rationale

The test evaluation document is the primary output of the test and evaluation process, an integral part of the systems engineering process, which identifies levels of performance and assists the developer in correcting deficiencies.

The PMAS Directive cites the Service Delivery and Engineering (SDE) organization as having primary responsibilities for system testing and certification.

Table of Contents

[1. Test Evaluation Introduction 5](#_Toc464466198)

[1.1. Test Evaluation Scope 5](#_Toc464466199)

[1.2. Test Architecture 6](#_Toc464466200)

[1.3. Test Environment/ Configuration 7](#_Toc464466201)

[1.4. Installation Process 8](#_Toc464466202)

[2. Test Data 8](#_Toc464466203)

[3. Issues 8](#_Toc464466204)

[4. Test Execution Log 9](#_Toc464466205)

[5. Test Defect Log 11](#_Toc464466206)

[6. Test Results Summary 11](#_Toc464466207)

[6.1. Defect Severity and Priority Levels 11](#_Toc464466208)

[6.2. Total Defects by Severity Level 11](#_Toc464466209)

[6.3. Defects by Severity Level and Increment 12](#_Toc464466210)

[6.4. Breakdown of Test Results 12](#_Toc464466211)

[6.5. Performance Testing 12](#_Toc464466212)

[6.5.1. Test Event 12](#_Toc464466213)

[6.5.2. Requirements Coverage Status 13](#_Toc464466214)

[6.5.3. Test Design 13](#_Toc464466215)

[6.5.4. Performance Test Results 14](#_Toc464466216)

[6.5.5. Transaction Response Times 14](#_Toc464466217)

[6.5.6. Server Resources 14](#_Toc464466218)

[7. Test Coverage 14](#_Toc464466219)

[7.1. Requirements Covered 14](#_Toc464466220)

[7.2. Section 508 Compliance Coverage 14](#_Toc464466221)

[8. Suggested Actions 14](#_Toc464466222)

[9. Defect Severity and Priority Definitions 14](#_Toc464466223)

[9.1. Defect Severity Level 14](#_Toc464466224)

[9.1.1. Severity Level 1 – Critical 15](#_Toc464466225)

[9.1.2. Severity Level 2 - High 15](#_Toc464466226)

[9.1.3. Severity Level 3 - Medium 15](#_Toc464466227)

[9.1.4. Severity Level 4 - Low 16](#_Toc464466228)

[9.2. Priority Classifications 16](#_Toc464466229)

[9.2.1. Priority 1 - Resolve Immediately 16](#_Toc464466230)

[9.2.2. Priority 2 - Give High Attention 16](#_Toc464466231)

[9.2.3. Priority 3 - Normal Queue 16](#_Toc464466232)

[9.2.4. Priority 4 - Low Priority 16](#_Toc464466233)

[10. Optional Tables, Charts, and Graphs 17](#_Toc464466234)

[11. Document Approval Signatures 18](#_Toc464466235)

# Test Evaluation Introduction

The Research Administrative Management System (RAMS) serves as a single front-end web-based data management and reporting application framework, with a centralized back-end database system based on SharePoint 2013 collaboration functionality. The purpose of RAMS testing is to measure the functional quality of the software against the specified user requirements, prior to the system’s release into the production environment. The testing process covers the major business functions for approval of both single-site and multi-site human research projects. It also provides the necessary traceability to the design and requirements artifacts to ensure that all components have been fully developed and can eventually operate in a production environment.

The Test Evaluation Summary collects, organizes, and presents the test results and key measures of testing to enable objective quality evaluation and assessment. This report provides the system’s stakeholders with an assessment of the adequacy of the management, operational, and technical controls used to protect the confidentiality, integrity, and availability of the system and the data it stores, transmits or processes.

## Test Evaluation Scope

The User Acceptance Testing (UAT) Result Report is for the Department of Veterans Affairs (VA) Office of Research and Development (ORD) Research Administrative Management System (RAMS) for Sustainment Release R1605. The scope of the report includes the assessment of the system level management, operational, and technical controls as documented in the System Design Document (SDD) and Master Test Plan that directly support the system.

UAT provides end-users the chance to validate the functionality of the RAMS Sustainment Release R1605 which includes the following high-level RAMS functional capabilities:

|  |
| --- |
| * Configure Browser Settings |
| * User Interface Enhancements - Saving an Application |
| * User Uploads a Document into an IRB Application after it has been submitted |
| * View All Available User Comments and Print |
| * Navigate to Other Sections while Toolbar is Expanded |
| * Select Compliant Method of Review Categories |
| * Reviewer Re-Submits Application to IRB Administrator |

## Test Architecture

RAMS Sustainment testing is conducted in a software quality assurance (SQA) environment which is located at the Philadelphia Information Technology Center (PITC). As shown in the diagram below, the testers connect to the RAMS Solution via standard Web Application ports over HTTPS. All communication between the RAMS components is through standard, VA approved communication protocols. Please refer to Section 1.3 for more details about the components that are part of the environment.

Figure 1: Environment Architecture

VA Intranet



## Test Environment/ Configuration

The RAMS Test environment is divided into the following conceptual layers and the related physical layer components depicted in Section 1.2:

* Presentation
* Application
* Platform
* Data

The Presentation layer is the top layer of the RAMS Solution architecture and represents the way a user interacts with the RAMS Solution. RAMS Solution interface is presented through the following client components:

* Standard Web Browsers
  + Via Standard Web content generated by the Application Layer such as
    - HTML
    - CSS
    - DHTML
    - JavaScript

The Application layer represents the RAMS Solution web application. In the Application layer, most application logic revolves around data validation, generation and presentation such as Dynamic Forms Generation and Completion, Grid, Menu and Dashboard layouts.

There is almost no business logic within the application layer. Instead, most of the business logic is provided at the platform layer using attribute metadata. Metadata is information about the elements of a set of data. The attribute metadata captures the following:

* All the rules about data context
* Business-defined rules

The Platform layer is the core of the RAMS Solution. The platform layer consists of:

* Apache Tomcat Application Server
  + Web Applications Deployed by the Apache Tomcat Application Server
* Microsoft IIS Server
  + SharePoint requires the Windows Server to have the IIS Server role installed

The security model protects the platform from unauthorized access across the web. Applications that interface with the RAMS Solution platform use standard VA standardized web services to communicate with. The Platform also controls access to data through security, controls access to the database and raises events for workflow processes and custom business logic implementations.

The Data layer, the lowest layer in the architecture, provides the Centralized databases for storing the RAMS Solution data. The Data layer also consists of the Document Repository, which serves content management and dashboard capabilities, as well as, workflow management used by the platform layer.

## Installation Process

The RAMS Project team will work with Enterprise Operations (PITC) team to install RAMS Sustainment Release R1605.

# Test Data

All the test cases that are executed for RAMS Sustainment Release R1605 UAT testing are designed to create test data as part of the execution of the test case. There is no external data dependency for the execution of the test cases.

# Issues

N/A

# Test Execution Log

The Test Execution Log is used to record the manual execution of test scripts and to document the test results for each test script. The table below shows the different testing iterations that took place during the software development life-cycle. Software Quality Assurance (SQA) testing beganon 08/18/2016 with all of the test cases for Sustainment Release R1605 executed by the RAMS Sustainment Test Team. Further iterations for SQA focused on testing new functionality and remediated defects.

User Acceptance Testing started and completed on 10/12/2016 with the UAT testers executing Sustainment Release R1605 test cases.

The Test Execution Log includes:

|  |  |
| --- | --- |
| Item | Definition |
| Test Case | The numerical identifier for the Test Case associated with this Test Script |
| Test Script ID | The identification number assigned to this test script |
| Date Tested | The date the test was executed |
| Build ID/ Patch # | The name of the build file installed prior to test execution or patch number and test version number |
| Actual Result:  Pass/Fail | The test outcome: P=Pass, F=Fail |
| Defect ID | The identification number assigned to the test failure |

The table below provides a list of the different testing iterations for RAMS Sustainment Release R1605:

**\* NOTE: Build ID Key**

* + SQA: RAMS Version R1605
  + UAT: RAMS Version R1605

| Test Case | Test Case ID | Test Script ID | Date(s) Tested | Build ID\* | Pass/Fail | Defect ID Verified |
| --- | --- | --- | --- | --- | --- | --- |
| **SQA** | | | | | | |
| Projects Management- Configure Browser Settings | 11495 | 103438 | 8/18/2016 | R1605 | Pass |  |
| Saving an IRB Application- RAM.PRO.17 | 11592 | 103640 | 9/26/2016 | R1605 | Pass | 351844, 365579 |
| User Uploads a Document to an IRB Application- RAM.DOC.21 | 112377 | 104844 | 9/26/2016 | R1605 | Pass | 365584 |
| View All Available User Comments and Print | 112636 | 105096 | 9/26/2016 | R1605 | Pass | 365559, 365548 |
| Manage Criteria for IRB Review: Navigate to Other Sections while Toolbar is Expanded | 112770 | 105192 | 9/1/2016 | R1605 | Pass | 264393 |
| User Uploads a Document into an IRB Application after it has been Submitted- RAM.DOC.22 | 112786 | 105216 | 9/1/2016 | R1605 | Pass | 365546 |
| Manage Criteria for IRB Review: Select Compliant Method of Review Categories | 113599 | 106383 | 9/22/2016 | R1605 | Pass | 226891 |
| Manage Criteria for IRB Review: Reviewer Re-Submits Application to IRB Administrator | 113672 | 106535 | 9/15/2016 | R1605 | Pass | 316585 |
| Saving an IRB Application- RAM.PRO.18 | 114178 | 10733 | 9/29/2016 | R1605 | Pass | 368587, 351844, 230493, 226942, 365579 |
| **UAT** | | | | | | |
| Projects Management- Configure Browser Settings | 11495 | 103438 | 10/12/2016 | R1605 | Pass |  |
| View All Available User Comments and Print | 112636 | 105096 | 10/12/2016 | R1605 | Pass | 365559, 365548 |
| Manage Criteria for IRB Review: Navigate to Other Sections while Toolbar is Expanded | 112770 | 105192 | 10/12/2016 | R1605 | Pass | 264393 |
| User Uploads a Document into an IRB Application after it has been Submitted- RAM.DOC.22 | 112786 | 105216 | 10/12/2016 | R1605 | Pass | 365546 |
| Manage Criteria for IRB Review: Select Compliant Method of Review Categories | 113599 | 106383 | 10/12/2016 | R1605 | Pass | 226891 |
| Manage Criteria for IRB Review: Reviewer Re-Submits Application to IRB Administrator | 113672 | 106535 | 10/12/2016 | R1605 | Pass | 316585 |
| Saving an IRB Application- RAM.PRO.18 | 114178 | 10733 | 10/12/2016 | R1605 | Pass | 368587, 351844, 230493, 226942, 365579 |

# Test Defect Log

Issues reported during the test execution process were entered into Rational Team Concert (RTC) Change and Configuration Management (CCM), a work item tracking system. Description of each work item was provided along with the test cycle in which it was found (Unit vs. SQA vs. UAT). Defects were either associated with a test case that failed or were judged to be a general defect of the application (e.g. a GUI/user interface issue). Severity level and Priority level were assigned to each defect along with a unique defect code generated after entering it into Rational. Severity levels and Priority levels were determined using the standard VA definitions which were documented in a tab of the defect tracking spreadsheet and shown in Section 9 of this report. The date of when each defect was opened or closed was also provided, as well as the status of the defect.

# Test Results Summary

## Defect Severity and Priority Levels

A defect is defined as a flaw in a component or system that can cause the component or system to fail to perform its required function, e.g., an incorrect statement or data definition. A defect, if encountered during execution, may cause a failure of the component or system.

Defects are categorized according to severity and priority levels. The test analyst assigns the severity, while the development manager assigns the priority for repair. For more information, see Defect Severity and Priority Definition in this Test Evaluation.

## Total Defects by Severity Level

At the end of UAT for RAMS Sustainment Release R1605, there were no (0) known outstanding defects reported from UAT. Feedback/comments captured during UAT were categorized. All remaining open defects or enhancements will be closed in the subsequent releases, as approved by the VA, or during the sustainment period following deployment to production.

## Defects by Severity Level and Increment

See Section 6.2 for a breakdown of all defects by Severity Level. There were 0 open defects reported from UAT.

## Breakdown of Test Results

The graph below details the breakdown of the UAT test results. The total of “Passed” and “Passed after Review” is the aggregate percentage of test cases that passed. As mentioned in Section 4.0, there were 35 test cases that passed out of a total of 35 that were run.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | | --- | |  | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

## Performance Testing

This section is not applicable for RAMS Sustainment Release R1605. Performance testing was not within scope of the UAT.

### Test Event

UAT began and ended on October 12, 2016. The RAMS Sustainment Team provided 7 test cases to the UAT Testers group, which consisted of 5 testers. All participants were able to complete all 7 test cases within the script. The testers read and executed each step, and marked the step as either Pass (P) or Fail (F), and documented comments, as applicable, for each test step.

The executed scripts were then tabulated by test status: Passed, Passed with Comments, Passed after Review, Failed, and Not Run.

* The “Passed with Comments” status indicates test cases that passed the test step; however, the UAT tester added his/her comments which were later reviewed by the Test Team.
* The “Passed after Review” status indicated that an item was originally marked as failed, but upon review by the SQA Test Team, the item was deemed to have passed. These discrepancies are sometimes the result of UAT tester errors and/or evaluation against an individual tester’s view of how the system should operate as opposed to how the system was implemented based on requirements (i.e. functions as designed).

There were 36 comments noted during UAT. Review by the SQA Team classified these comments as 18 **\*potential** perfective maintenance change requests (which will need to be vetted by the business for validity and priority) and 18 general comments related to test cases. For more details regarding the R1605 UAT Comments, please see the attached tracking sheet.

After 10/12/2016’s UAT results were captured by the RAMS team, the RAMS sustainment team had updated the test results with the comments provided by the UAT Testers, and conducted triage internally to validate and classify the results.

The UAT summary test metrics are shown below:

* 35 test cases were executed
* 35 test cases Passed
  + 35 were passed by the UAT tester
  + 0 were promoted to pass after review by the RAMS SQA Test Team
* 0 test cases Failed
* 0 test cases were Not Run

### Requirements Coverage Status

N/A

### Test Design

N/A

### Performance Test Results

N/A

### Transaction Response Times

N/A

### Server Resources

N/A

# Test Coverage

## Requirements Covered

Please refer to the Requirements Traceability Matrix (RTM) for a detailed mapping between requirements and test cases.

## Section 508 Compliance Coverage

The RAMS Sustainment Team has completed internal verification of the R1605 code to conform to Section 508 Compliance standards.

# Suggested Actions

All comments made by UAT participants have been collated and categorized based on their type (i.e. General Feedback or Potential Perfective Maintenance Change Request). All comments that were categorized as ‘Potential Perfectie Maintenance Change Requests’ need to be validated, and prioritized by the business in order for the comments to be a part of the product backlog in RTC.

# Defect Severity and Priority Definitions

The classification of defects within a system examines both the severity and priority of the defect.

Severity is a measure of how great the impact is on the user’s ability to complete the documented actions within the system.

Priority determines the speed with which a given defect must be repaired.

Defect classification may be determined either because testing is delayed by a failure in the system or because a cumbersome workaround prevents a user from completing the assigned tasks. Both severity and priority measures must be recorded when scheduling defect resolution tasks.

## Defect Severity Level

The following subsections identify the defect severity levels.

### Severity Level 1 – Critical

Institute of Electrical and Electronics Engineers (IEEE) definition: The defect results in the failure of the complete software system, of a subsystem, or of a software unit (program or module) within the system.

* Any defect that compromises patient safety or system security. Examples of system security defects include breach of confidentiality requirements of the Privacy Act, the Health Insurance Portability and Accountability Act (HIPAA), or Federal Tax Information guidelines.
* Loss of system functionality critical to user operations with no suitable workaround, i.e., there is no way to achieve the expected results using the application.
* System crash or hang that prevents further testing or operation of the complete application or a section of the application.
* Any defect that causes corruption of data from a result of the system (as opposed to user error).
* Any defect in which inappropriate transmissions are consistently generated or appropriate transmissions of HL7 messages fail to be generated.
* Loss of functionality resulting in erroneous eligibility/enrollment determinations or communications not being sent.

### Severity Level 2 - High

IEEE definition: The defect results in the failure of the complete software system, of a subsystem, or of a software unit (program or module) within the system. There is no way to make the failed component(s) function. However, there are acceptable processing alternatives which will yield the desired result.

* A major defect in the functionality that does not result in corruption of data.
* A major defect in the functionality resulting in a failure of all or part of the application, where:
* The expected results can temporarily be achieved by alternate means. The customer indicates the work around is acceptable for the short term.
* Any defect that does not conform to Section 508 standards.
* Any defect that results in inaccurate or missing requirements.
* Any defect that results in invalid authentication or authentication of an invalid end user.

### Severity Level 3 - Medium

IEEE definition: The defect does not result in a failure, but causes the system to produce incorrect, incomplete, or inconsistent results, or the defect impairs the systems usability.

* Minor functionality is not working as intended and a workaround exists but is not suitable for long term use
* The inability of a valid user to access the system consistent with granted privileges
* Typographical or grammatical errors in the application, including installation guides, user guides, training manuals, and design documents
* Any defect producing cryptic, incorrect, or inappropriate error messages
* Any defect that results from the use of non-standard data terminology in the application or documentation, as defined by the Department of Veterans Affairs
* Cosmetic issues that are important to the integrity of the product, but do not result in data entry and or data quality problems.

### Severity Level 4 - Low

IEEE definition: The defect does not cause a failure, does not impair usability, and the desired processing results are easily obtained by working around the defect.

* Minor loss of, or defect in the functionality where a long term use exists
* Low-level cosmetic issues.

## Priority Classifications

The following subsections identify the appropriate actions for defects at each priority level, per definitions of IEEE.

### Priority 1 - Resolve Immediately

Further development and/or testing cannot occur until the defect has been repaired. The system cannot be used until the repair has been affected.

### Priority 2 - Give High Attention

The defect must be resolved as soon as possible because it is impairing development and/or testing activities. System use will be severely affected until the defect is fixed.

### Priority 3 - Normal Queue

The defect should be resolved in the normal course of development activities. It can wait until a new build or version is created.

### Priority 4 - Low Priority

The defect is an irritant that should be repaired, but can be repaired after more serious defects have been fixed.

# Optional Tables, Charts, and Graphs

N/A

# Document Approval Signatures

Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Program/Project Manager Date

Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Business Sponsor Representative Date

Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lead Tester Date