As-Run Test Plan for EAC 2005 VVSG Certification Testing to be Performed on Election Systems & Software Voting System 3.4.1.4

Issue Date: 08/24/2016

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REVISIONS

Revision	Reason for Revision	Date
NR	Initial Release	06/15/2016
A	Revised based on EAC comments	07/15/2016
B	Revised based on additional EAC comments	07/21/2016
C	Updated based on the EAC comments on the test report	08/02/2016
D	Updated Table B-1	08/24/2016

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1.0 INTRODUCTION

Election Systems & Software (ES&S), hereafter referred to as manufacturer, submitted the Unity 3.4.1.4 system to the Election Assistance Commission (EAC), for certification testing to the 2002 Voting System Standards (2002 VSS). Unity 3.4.1.4 is a modification to the previously 2002 VSS certified Unity 3.4.1.0 (Certification number: ESSUnity3410), and as such, will be tested by National Technical Systems Huntsville (NTS Huntsville) based on the "modified system" requirements set forth in section 4.6.2.3 of the EAC Testing and Certification Program Manual, Version 2.0, herein referred to as the Program Manual. All testing on the submitted modifications will be tested to the 2005 Voluntary Voting System Guidelines (2005 VVSG). Pending successful completion of this test campaign, the Unity 3.4.1.4 system will be granted a 2002 VSS certification based on the original full system certification. This National Certification Test Plan, hereafter referred to as the Test Plan, documents the process and test methods that will be used to validate 2005 VVSG compliance of Unity 3.4.1.4 modifications.

1.1 Description and Overview of EAC Certified System Being Modified

The following subsections describe the EAC Certified System that is the baseline for the submitted modification. All information was derived from the previous Certification Test Report(s) and EAC Certificate of Conformance.

1.1.1 Baseline Certified System

Tables 1-1 and 1-2 describe the hardware and software/firmware versions that were previously certified by the EAC. For a complete description of the configuration and description of the previously certified product, refer to the Unity 3.4.1.0 Test Report located on the EAC's website at http://www.eac.gov.

Table 1-1. Previously Certified Software

Software	Software/Firmware Version
Proprietary Software	
Audit Manager (AM)	7.5.2.0
Election Data Manager (EDM)	7.8.2.0
ES&S Image Manager (ESSIM)	7.7.2.0
Hardware Programming Manager (HPM)	5.9.0.0
Election Reporting Manager (ERM)	7.9.0.0
Log Monitor Service	1.1.0.0
AutoMARK Information Management System (AIMS)	1.3.257
VAT Previewer	1.3.2907
Proprietary Hardening Scripts	
CreateNewERM_USER_ONLY	1.0.0.0
CreateNewUsers	1.3.0.2
PreInstall	1.3.0.2
PostInstall	1.3.0.2
ServerShare	3.0.4.0
NoNetwork	3.0.3.0
COTS Software	
Windows 7 Professional	7 w/ SP1
Windows Server 2008 R2	2008 R2 w/ SP1
RM/Cobol	12.06

1.1.1 Baseline Certified System (Continued)

Table 1-1. Previously Certified Software (Continued)

Software	Software/Firmware Version
Microsoft Office Excel	2007
Adobe Acrobat Standard	9.0, X, XI
WSUS Microsoft Windows Offline Update Utility	8.8
Symantec Endpoint Protection	12.1.4
Symantec Endpoint Protection Intelligent Updater	20140130-001-v5i64.exe

Table 1-2. Previously Certified Voting System Equipment

Component	Hardware Version	Firmware Version
Proprietary Hardware		
DS200 Precinct Count Scanner	1.2, 1.2.3, & 1.3	1.7.0.0
M100 Precinct Count Scanner	1.3	5.4.4.5
AutoMARK A100	1.0	1.3.2907
AutoMARK A200	1.1	1.3.2907
AutoMARK A200	1.3(Printer Board 1.70)	1.3.2907
AutoMARK A200	1.3(Printer Board 1.65)	1.3.2907
DS850 Central Count Scanner	1.0	2.9.0.0
M650 Central Count Scanner	1.1 & 1.2	2.2.2.0
Plastic Ballot Box	1.2 & 1.3	N/A
Metal Ballot Box	1.0, 1.1, & 1.2	N/A
COTS Hardware		
EMS Client Laptop – Dell	Latitude E6410 & E6420	N/A
EMS Server – Dell	T110	N/A
EMS Client Desktop – Dell	Optiplex 3010	N/A
Delkin USB Flash Drives	512MB, 1, 2, 4, & 8GB	N/A
Delkin Compact Flash	1GB	N/A
DS850 Report Printer	OKI B430dn & B431dn	N/A
DS850 Audit Printer	OKI Microline 420	N/A
Avid Headphones	Avid FV 60	N/A
SanDisk CF Card Reader	018-6305	N/A

1.1.2 Revision History

Table 1-3 describes the version history of the submitted voting system.

Table 1-3. Voting System Revision History

System Version	Certification Type	System Modified	Certification Date	Certification Number
Unity 3.2.1.0	New System	N/A	03/29/11	ESSUnity3210
Unity 3.4.0.0	Modification	Unity 3.2.1.0	10/31/12	ESSUnity3400
Unity 3.4.1.0	Modification	Unity 3.4.0.0	04/04/14	ESSUnity3410
Unity 3.4.1.4	Modification	Unity 3.4.1.0	TBD	ESSUnity3414

1.1.3 Description of Submitted Modifications

The changes submitted for this modification are presented in this section.

Election Report Manager (ERM)

- Added counters associated with Registered Voter statistics to the file format of the election_name.RCY file.

Hardware Programming Manager (HPM)

- Corrected an issue where users were unable to create DS850 parameters for a Pennsylvania cross endorsed election with more than 8 candidates.

Hardware

- Added the Okidata B431d as an additional report print for the DS850.

1.1.4 Initial Assessment

An initial assessment was performed to determine the scope of testing for the submitted modification. The results of this assessment are presented in three categories: functional, software, and technical data package (TDP).

In addition to the modifications submitted for Unity 3.4.1.4, as described in Section 1.1.3 of this test plan, ES&S requested that additional testing be performed to verify that data can be exchanged utilizing the modified .RCY file between Unity 3.4.1.4 voting system and the voting systems previously qualified by the National Association of State Election Directors (NASED), specifically Unity 3.0.1.0 and Unity 3.0.1.1 voting systems. The Unity 3.0.1.0 and 3.0.1.1 voting systems were never tested or certified under the EAC Testing and Certification Program and hold no official status under the EAC Testing and Certification Program. Therefore, any testing, including the data exchange between the submitted Unity 3.4.1.4 system and the NASED qualified systems, is outside the scope of the EAC Testing and Certification Program.

Functional Assessment:

Based on the assessment of submitted changes, NTS determined that a limited Functional Configuration Audit will be required to verify that the voting system meets 2005 VVSG requirements. “Limited” in this instance refers to only functional changes made in this modification (new features, changes to functions, etc.) or functions that have not changed but may be impacted by the modification or changes. In addition, the voting system will be subjected to a system integration test, defined in section 4.5.3 of this plan, to ensure all components interact properly and to verify that the changes to the voting system do not introduce any nonconformities or instabilities.

Software Assessment:

All added or modified Lines of Code (LOC) will require a source code review to ensure the 2005 VVSG requirements are met and that changes to the software do not introduce any new functions or features. In determining the extent of the required source code review, the submitted source code for Unity 3.4.1.4 was compared to the EAC certified Unity 3.4.1.0 source code. Table 1-4 provides the software comparison results. Only the products listed in Table 1-4 were modified.

1.1.4 Initial Assessment (Continued)

Table 1-4. Software Comparison Results

Product	Baseline	New Version	Lines of Code Changed	
			Files	Lines
ERM	7.9.0.0	7.9.0.1	10	825
HPM	5.9.0.0	5.9.0.1	8	727
Totals			**18**	**1552**

TDP Assessment:

The submitted TDP is constructed with the certified Unity 3.4.1.0 TDP and the Unity 3.4.1.4 changes to the certified documents. NTS Huntsville personnel determined that the following documents are impacted by this modification:

- U3410_CM_L_9003_COTSPIP
- U3410_PRE04_ConformityStatement
- U3410_D_D_9001_EACAppTrace
- U3410_PRE05_Requirements Matrix
- U3410_C_D_0100_SysOvr
- U3410_C_D_0200_SFD
- DS200HW_M_SPC_0312_HWSpec
- DS200HW_M_SPC_0313_HWSpec
- DS850HW_M_SPC_0310_HWSpec
- M100HW_M_SPC_0313_HWSpec
- M650HW_M_SPC_0312_HWSpec
- ESSSYS_D_D_0100_Coding Standards
- U3410_SDS02_BallotImageProcessingSpec
- ESSSYS_SG_P_1000_SystemDevProgram
- U3410_SDS00_AM
- U3410_SDS00_AM01_CountyModel
- U3410_SDS00_DS200
- U3410_SDS00_DS850
- U3410_SDS00_EDM
- U3410_SDS00_EDM01_CountyModel
- U3410_SDS00_EDM02_ElectionModel
- U3410_SDS00_ERM
- U3410_SDS00_ERM01_Appendices

1.1.4 Initial Assessment (Continued)

TDP Assessment (Continued):

A review of these documents shall ensure that all Unity 3.4.1.4 changes are properly documented and compliant with 2005 VVSG.

Hardware Assessment:

Based on the assessment of submitted hardware change, NTS determined that no hardware testing will be required. The only difference between the previously certified Okidata B431dn and the submitted Okidata B431d is the removal of the network card. The Okidata B431d will be included in all DS850 functional and system integration test.

Regression Test

Regression testing shall be conducted on HPM and ERM to establish assurance that the modifications have no adverse impact on the compliance, integrity, or performance of the system as outlined in the 2005 VVSG.

1.2 References

- Election Assistance Commission 2005 Voluntary Voting System Guidelines, Volume I, Version 1.0, "Voting System Performance Guidelines," and Volume II, Version 1.0, "National Certification Testing Guidelines," dated December 2005
- Election Assistance Commission Testing and Certification Program Manual, Version 2.0, expiration date June 30, 2018
- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 2.0, expiration date June 30, 2018
- National Voluntary Laboratory Accreditation Program NIST Handbook 150, 2006 Edition, "NVLAP Procedures and General Requirements (NIST Handbook 150)," dated February 2006
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, "Voting System Testing (NIST Handbook 150-22)," dated May 2008
- United States 107th Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- NTS Quality Assurance Program Manual, Revision 8
- ANSI/ISO/IEC 17025:2005 and ANSI/NCSL Z540.3, "Calibration Laboratories and Measuring and Test Equipment, General Requirements"
- ISO 10012:2003, "Quality Assurance Requirements for Measuring Equipment"
- EAC Requests for Interpretation (RFI) located at: http://www.eac.gov/testing_and_certification/request_for_interpretations1.aspx
- EAC Notices of Clarification (NOC) lactated at: http://www.eac.gov/testing_and_certification/notice_of_clarifications.aspx
- EAC Quality Monitoring Program located at: http://www.eac.gov/testing_and_certification/quality_monitoring_program.aspx

1.2 References (Continued)

- NTS Test Report No. T71220.01-01 – National Certification Test Report for Certification Testing of the Election Systems & Software Unity 3.4.1.0 Voting System
- ES&S Unity 3.4.1.0 Technical Data Package
- ES&S Unity 3.4.1.4 Technical Data Package

1.3 Terms and Abbreviations

Table 1-5 defines all terms and abbreviations applicable to this Test Plan.

Table 1-5. Terms and Abbreviations

Term	Abbreviation	Definition
Anomaly	--	Any non-repeatable testing event that is not the expected result or interrupts the test operations.
Americans with Disabilities Act 1990	ADA	ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability.
AutoMARK Information Management System	AIMS	A windows-based election management system software application to define election parameters for the VAT, including functionality to import election definition files produced by the Unity EMS and create VAT flash memory cards
Audit Manager	AM	A windows-based election management system software application to define election parameters for the VAT, including functionality to import election definition files produced by the Unity EMS and create VAT flash memory cards
Configuration Management	CM	Systems engineering process for establishing and maintaining consistency of a product's performance, functional and physical attributes with its requirements, design and operational information throughout its life.
Commercial Off-the-Shelf	COTS	Commercial, readily available hardware or software.
Deficiency	--	Any repeatable test result that was not the expected result or violates a requirement of the 2005 VVSG.
United States Election Assistance Commission	EAC	Commission created per the Help America Vote Act of 2002, assigned the responsibility for setting voting system standards and providing for the voluntary testing and certification of voting systems.
Election Data Manager	EDM	Unity EMS data entry component
Election Management System	EMS	Within the Unity 3.4.1.4 voting system, the EMS is comprised of eight components: AM, EDM, ESSIM, HPM, ERM, Log Monitor Service, AIMS, and VAT Previewer.
Election Reporting Manager	ERM	Unity EMS reporting component.
Election Systems and Software	ES&S	Identified manufacturer doting the equipment under test as part of this test plan.

1.3 Terms and Abbreviations (Continued)

Table 1-5. Terms and Abbreviations (Continued)

Term	Abbreviation	Definition
ES&S Image Manager	ESSIM	A component within the Unity EMS that allows users to design and print ES&S paper ballots.
Engineering Change Order	ECO	--
Equipment Under Test	EUT	Refers to the individual system component or multiple piece of the same component.
Functional Configuration Audit	FCA	Verification of system functions and combination of functions cited in the manufacturer's documentation.
Help America Vote Act	HAVA	Act created by United States Congress in 2002.
Hardware Programming Manager	HPM	Unity component used to create election definition media for voting system equipment.
Institute of Electrical and Electronics Engineers	IEEE	--
Intelligent Mark Recognition	IMR	Visible light scanning technology to detect completed ballot targets.
National Institute of Standards and Technology	NIST	Government organization created to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhances economic security and improves our quality of life.
Notice of Clarification	NOC	Provides further guidance and explanation on the requirements and procedures of the EAC's Voting System Certification or Voting System Testing Laboratory programs.
National Technical Systems, Inc.	NTS	Identified VSTL hosting the testing of the equipment listed in this test plan; facilities located in Huntsville, Alabama.
National Voluntary Laboratory Accreditation Program	NVLAP	Program which provides an unbiased third-party test and evaluation program to accredit laboratories in the respective fields to ISO 17025 standard.
NTS Operating Procedure	OP	NTS Test Method or Test Procedure
Physical Configuration Audit	PCA	Review by accredited test laboratory to compare voting system components submitted for certification testing to the manufacturer's technical documentation, and confirmation the documentation meets national certification requirements
Personal Computer	PC	Computer component of the Unity 3.4.1.4 voting system.
Quality Assurance	QA	Administrative and procedural activities implemented as a way of preventing mistakes or defects
Quantity	QTY	Number/Count of items
Quick Response Code	QR Code	Two-dimensional barcode

1.3 Terms and Abbreviations (Continued)

Table 1-5. Terms and Abbreviations (Continued)

Term	Abbreviation	Definition
Request for Interpretation	RFI	A means by which a registered Manufacturer or Voting System Test Laboratory (VSTL) may seek clarification on a specific Voluntary Voting System Guidelines (2005 VVSG) standard.
System Under Test	SUT	Refers to the system as a whole (all components).
Technical Data Package	TDP	Manufacturer documentation related to voting system required to be submitted as a precondition of testing.
Trusted Build	---	Final build of source code performed by a trusted source and overseen by the manufacturer which is delivered to the EAC designated repository; also referred to as a "Witness Build".
Underwriters Laboratories Inc.	UL	Safety consulting and certification company
Uninterruptible Power Supply	UPS	Electrical apparatus providing emergency power when an input power source fails.
Voter Assist Terminal	VAT	Electronic ballot marking device component is the ES&S AutoMARK
Virtual Review Tool	VRT	Test campaign management software used by the EAC and manufacturers applying for qualification testing.
Voting System Test Laboratory	VSTL	NTS
Voting System Standards	VSS	EAC 2002 Voting System Standards
Voluntary Voting System Guidelines	VVSG	EAC Voluntary Voting System Guidelines Version 1.0

1.4 Project Schedule

The project schedule for the test campaign is in Appendix C – Project Schedule.

1.5 Scope of Test

The scope of testing is limited to the modifications to the previously certified Unity 3.4.1.0 voting system as described in Section 1.1.3.

1.5.1 Block Diagram

Figure 1-1 provides a visual system overview of the submitted voting system.

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1.5.1 Block Diagram (Continued)

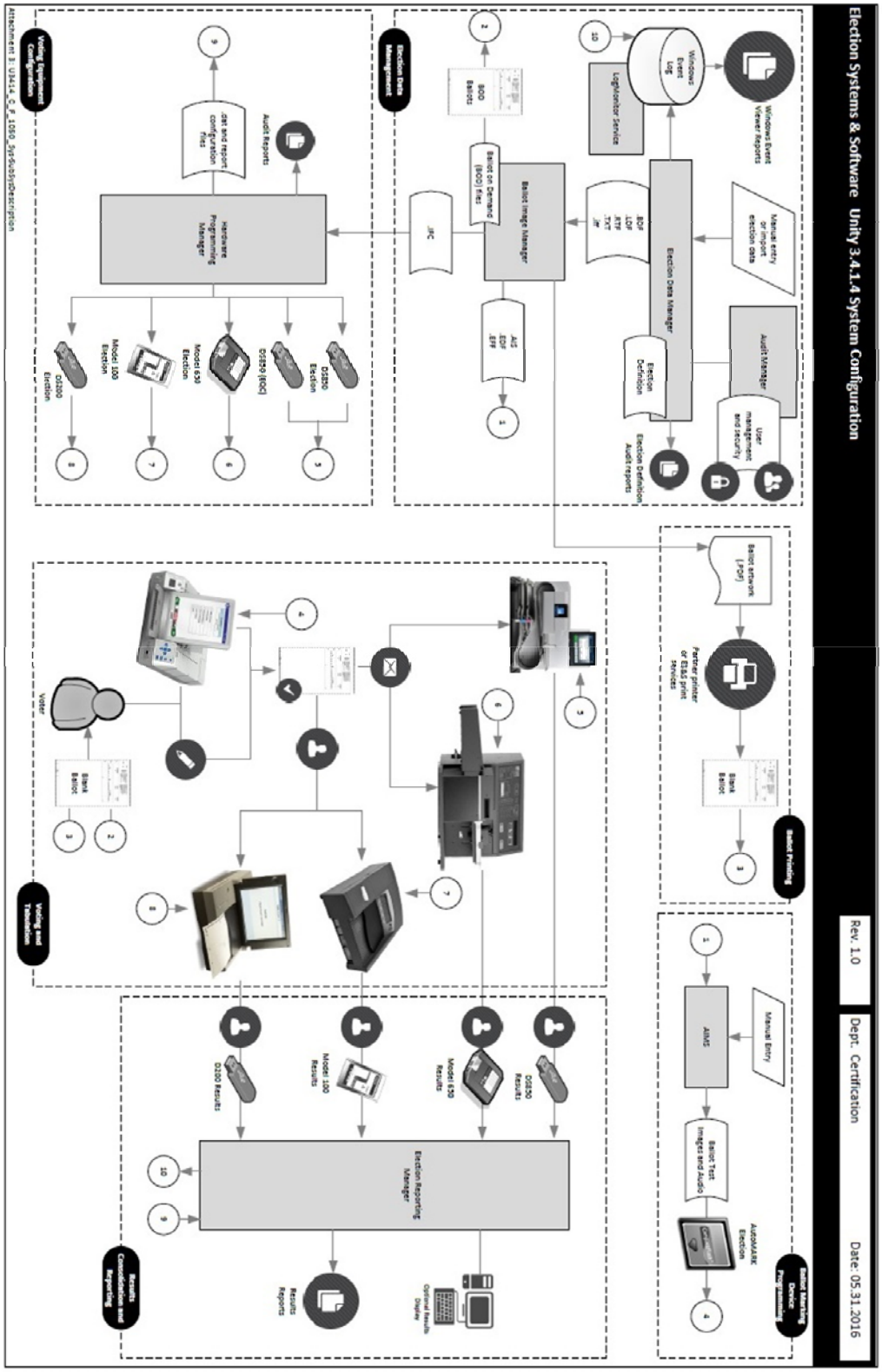

Figure 1-1. System Overview Diagram

1.5.2 System Limits

System limitations remain unchanged for all previously certified components of the Unity 3.4.1.0 voting system.

1.5.3 Supported Languages

The submitted voting system supports English and Spanish.

1.5.4 Supported Functionality

Table 1-6 lists the functionality supported by the submitted voting system.

Table 1-6. Supported Functionality

Functionality	Description
Election Data Management	Managing election data supports all tasks related to the creation of the election database, precinct, office, and candidate information required to configure a jurisdiction's elections
Ballot Formatting and Printing	Ballot formatting and printing includes activities required for defining the image of a paper ballot, populating that ballot with information imported from the election database, and printing the ballot with ballot style code.
Voting Equipment Configuration	Configuring voting equipment converts election database information into ballot definition parameters for ES&S voting equipment. Within this functional subsystem, software users transfer the election rules specific to an election to the memory devices used to program voting equipment.
Voting and Tabulation	Voting and tabulation includes the following: • Accessible ballot marking includes all tasks related to preparing, testing and implementing assistive voting devices for use in a polling place environment. • All tasks related to preparing, testing and implementing universal voting devices for use in a polling place environment with the option of precinct vote summary card tabulation. • Precinct ballot tabulation covers the activities required to prepare, test and scan official ballots and/or vote summary cards at a precinct location. • Central ballot tabulation includes all tasks required to prepare, test and scan official ballots and/or vote summary cards at a central count location.
Results Consolidation and Reporting	Results consolidation and reporting encompasses the functions necessary to gather and combine results from ballot scanners and use that data to generate paper and electronic reports for election workers, candidates and the media.

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2.0 PRE-CERTIFICATION TESTING AND ISSUES

This section describes testing performed by either VSTL or the manufacturer prior to submitting the voting system to the EAC.

2.1 Evaluation of Prior VSTL Testing

No prior VSTL testing was submitted for re-use consideration.

2.2 Evaluation of Prior Non-VSTL Testing

No Non-VSTL testing was submitted for re-use consideration.

2.3 Known Field Issues

Two technical advisories (see also the EAC Formal investigation Report, dated December 20, 2011) have been issued by the EAC concerning known field issue of the DS200, each of which is summarized below:

- EAC Technical Advisory ESS2011-02: During local acceptance testing in a jurisdiction, multiple DS200 Ballot Scanners exhibited an anomaly where the touch screen interface would stop responding to touches.

- EAC Technical Advisory ESS2011-03: During local acceptance testing, a DS200 Ballot Scanner failed to count a marked ballot position resulting in a lost vote.

In response to the technical advisories, ES&S has published two Technical Bulletins, PRBDS2000013 and FYIDS2000021, both of which are dated August 3, 2011. These issues were corrected in prior EAC test campaigns and the changes were incorporated in this release.

3.0 MATERIAL REQUIRED FOR TESTING

The following sections list the materials required to be delivered to facilitate testing of the submitted system.

3.1 Software

Proprietary software and COTS identified in Table 3-1 will be provided by the manufacturer as part of this test campaign.

Table 3-1. Required Voting System Software

Software	Software/Firmware Version
Proprietary Software	
Audit Manager (AM)	7.5.2.0
Election Data Manager (EDM)	7.8.2.0
ES&S Image Manager (ESSIM)	7.7.2.0
Hardware Programming Manager (HPM)	5.9.0.1
Election Reporting Manager (ERM)	7.9.0.1
Log Monitor Service	1.1.0.0
AutoMARK Information Management System (AIMS)	1.3.257
VAT Previewer	1.3.2907

3.1 Software (Continued)

Table 3-1. Required Voting System Software (Continued)

Proprietary Hardening Scripts	
CreateNewERM_USER_ONLY	1.0.0.0
CreateNewUsers	1.3.0.2
PreInstall	1.3.0.2
PostInstall	1.3.0.2
ServerShare	3.0.4.0
NoNetwork	3.0.3.0
COTS Software	
Windows 7 Professional	7 w/ SP1
Windows Server 2008 R2	2008 R2 w/ SP1
RM/Cobol	12.06
Microsoft Office Excel	2007
Adobe Acrobat Standard	9.0, X, and XI
WSUS Microsoft Windows Offline Update Utility	8.8
Symantec Endpoint Protection	12.1.4
Symantec Endpoint Protection Intelligent Updater	20140130-001-v5i64.exe

3.2 Hardware

Proprietary equipment and COTS identified in Table 3-2 will be provided by the manufacturer as part of this test campaign.

Table 3-2. Required Voting System Equipment

Component	Hardware Version	Firmware Version
Proprietary Hardware		
DS200 Precinct Count Scanner	1.2, 1.2.3, & 1.3	1.7.0.0
M100 Precinct Count Scanner	1.3	5.4.4.5
AutoMARK A100	1.0	1.3.2907
AutoMARK A200	1.1	1.3.2907
AutoMARK A200	1.3(Printer Board 1.70)	1.3.2907
AutoMARK A200	1.3(Printer Board 1.65)	1.3.2907
DS850 Central Count Scanner	1.0	2.9.0.0
M650 Central Count Scanner	1.1 & 1.2	2.2.2.0
Plastic Ballot Box	1.2 & 1.3	N/A
Metal Ballot Box	1.0, 1.1, & 1.2	N/A
COTS Hardware		
EMS Client Laptop – Dell	Latitude E6410 & E6420	N/A
EMS Server – Dell	T110	N/A
EMS Client Desktop – Dell	Optiplex 3010	N/A
Delkin USB Flash Drives	512MB, 1, 2, 4, & 8GB	N/A
Delkin Compact Flash	1GB	N/A

3.2 Hardware (Continued)

Table 3-2. Required Voting System Equipment (Continued)

Component	Hardware Version	Firmware Version
COTS Hardware		
DS850 Report Printer	OKI B430dn, B431dn, and B431d	N/A
DS850 Audit Printer	OKI Microline 420	N/A
Avid Headphones	Avid FV 60	N/A
SanDisk CF Card Reader	018-6305	N/A

3.3 Test Materials

Test Materials Table 3-3 describes the test materials required to execute the required testing. Test materials may not be fully tested during the campaign, but are used to support the tests conducted during the campaign. The following items listed may not be included in the baseline system or Scope of Certification document.

Table 3-3. Required Test Materials

Test Material	Quantity	Make	Model
Ballot on Demand Printer	1	OKI Data	C9650
ES&S Pens	20	BIC	Grip Roller
Ethernet Switch	1	D-Link	F321387016586

3.4 Deliverables

The materials listed in Table 3-4 are identified by the manufacturer as materials deliverable to the end users.

Table 3-4. Voting System Deliverables

Deliverable Material	Version	Description
AM	7.5.2.0	EMS
EDM	7.8.2.0	EMS
ESSIM	7.7.2.0	EMS
HPM	5.9.0.1	EMS
ERM	7.9.0.1	EMS
Log Monitor Service	1.1.0.0	EMS
AIMS	1.3.257	EMS
VAT Previewer	1.3.2907	EMS
M100	Firmware 5.4.4.5; Hardware 1.3	Optical Scan Precinct Scanner
DS200	Firmware 1.7.0.0; Hardware 1.2.1 or 1.2.3 or 1.3	Precinct Ballot Scanner
AutoMARK A100 or A200 or A300	Firmware 1.3.2907; Hardware 1.0 or 1.1 or 1.3	Voter Assist Terminal
M650	Firmware 2.2.2.0; Hardware 1.1 or 1.2	Central Ballot Scanner
DS850	Firmware 2.9.0.0; Hardware 1.0	Central Ballot Scanner

3.4 Deliverables (Continued)

Table 3-4. Voting System Deliverables (Continued)

Deliverable Material	Version	Description
OKI Printer	OKI B430dn, B431dn, or B431d	Laser Report Printer
Headphones	Avid FV 60	Stereo Headphones
Unity 3.4.1.4 Voting System Overview	1.3	TDP Document
Unity 3.4.1.4 System Functionality Description	1.0	TDP Document
ES&S Audit Manager User's Guide	1.1	TDP Document
ES&S Election Data Manager Operator's Guide	1.1	TDP Document
ES&S Election Reporting Manager User's Guide	1.1	TDP Document
ES&S Image Manager User's Guide	1.1	TDP Document
Hardware Programming Manager User's Guide	1.0	TDP Document
ES&S Log Monitor User's Guide	1.0	TDP Document
M100 Operator Guide	1.1	TDP Document
DS200 Operator's Guide	1.0	TDP Document
DS850 Operator's Guide	1.0	TDP Document
ES&S Model 650 System Operators Guide	1.1	TDP Document
AutoMARK Jurisdiction Guide	13	TDP Document
AutoMARK Poll Worker Guide	14	TDP Document
AutoMARK Voter Guide	13	TDP Document
Voting System Security Specification	1.0	TDP Document
Security Script Description	1.0	TDP Document
AIMS System Security Specifications	9	TDP Document
AutoMARK System Security Specification	11	TDP Document

3.5 Proprietary Data

All data considered by the manufacturer to be proprietary is marked as such.

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4.0 TEST DESIGN AND SPECIFICATIONS

NTS Huntsville personnel shall ensure that all certification testing conducted on the manufacturer's voting system follows NTS Huntsville's procedures for testing, the requirements of the EAC 2005 VVSG, and the Program Manual.

4.1 Requirements

To evaluate the modification test requirements, each section of the EAC 2005 VVSG was analyzed to determine the applicable tests required. The following subsections detail the results of this analysis.

4.1.1 Requirements Mapping

The requirements mapping is provided in conjunction with submitted modifications. NTS Huntsville will verify and validate that the manufacturer is in compliance with stated QA and CM plans.

Table 4-1. Modification Requirements Mapping

Change ID	Changed Component	Change Description	Impacted 2005 VVSG Requirement
ENH35644	ERM	Added counters associated with Registered Voter statistics to the file format of the election_name.RCY file.	Vol II Section 6.7
BUG35700	HPM	Unable to create DS850 parameters for PA cross endorsed election with more than 8 candidates.	Vol II Section 6.7, Vol I Section 2.1.7.2

4.1.2 Rationale for Excluded Requirements

NTS Huntsville determined all requirements excluded from the previous test campaign were not applicable to the submitted modifications listed in Section 1.1.3 based on one or more of the following criteria:

- The submitted modification will not impact the specific requirement.
- It was previously determined that the specific requirement was not applicable to the baseline system.
- A NOC or RFI made the specific requirement not applicable.

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4.1.3 NOCs

Applicable NOCs released by the EAC as of the date of the Test Plan are listed in Table 4-2.

Table 4-2. Applicable NOCs

NOC ID	Name
2016-01	Test Readiness Review
2016-02	Trusted Build

4.1.4 RFIs

Applicable RFIs released by the EAC as of the date of the Test Plan are listed in Table 4-3.

Table 4-3. Applicable RFIs

RFI ID	Name
2008-03	EAC Decision on OS Configuration
2008-05	EAC Decision on Durability
2009-04	EAC Decision on Audit Log Events
2010-02	EAC Decision on Coding Conventions
2010-03	EAC Decision on Database Coding Conventions
2010-05	EAC Decision on Testing of Modifications to a Certified System
2010-07	EAC Decision on Module Length Comments and responses
2010-08	EAC Decision on Calling Sequence
2012-03	EAC Decision on Configuration Management of COTS Products
2012-04	EAC Decision on Software Setup Validation
2013-03	EAC Decision on Timestamps
2013-04	EAC Decision on Usability Testing
2015-05	EAC Decision on Touchscreen Technology

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4.2 Hardware Configuration and Design

ES&S Unity 3.4.1.4 is an electronic voting system consisting of two precinct paper-based voting systems, the M100 and DS200, two central count voting systems, the M650 and DS850, and a voting system application software package. In addition, the paper-based system is comprised of three voter assistance terminals, AutoMark A100, AutoMark A200, and AutoMark A300. The AutoMark is a ballot marking device that prints the voter's choices on to a ballot that is digitally scanned for tabulation by the M100, DS200, M650 or the DS850. The voting system application software package, Unity Election Management System (EMS), is an application suite consisting of Audit manager (AM), AutoMARK Information Management System (AIMS), Election Data Manager (EDM), ES&S Image Manager (ESSIM), Hardware Programming Manager (HPM), Election Reporting Manager (ERM), Log Monitor Service, and VAT Previewer.

4.3 Software System Functions

The software system functions as described in the manufacturer submitted TDP are unchanged for all previously certified components of the Unity 3.4.1.0 voting system.

4.4 Test Case Design

Test cases are designed around what the voting system is supposed to do (per the manufacturers design specifications) and what the voting system is required to do (per the guiding standards document). The tests cases used are primarily functional in nature; however, in certain cases, NTS may use non-functional tests. The test designer selects both valid and invalid inputs and determines the correct output without any knowledge of the test object's internal structure. The acceptable range for system performance and the expected results for each test case are derived from the manufacturer's documentation and the 2005 VVSG. All test cases are validated and approved by the project lead or other qualified VSTL personnel, (i.e., VSTL QA Representative).

4.4.1 Software Module Test Case Design and Data

NTS Huntsville personnel implements component level testing during the Functional Configuration Audit (FCA) for each component and subcomponent exercising the functionality of each as designed and documented. NTS Huntsville will utilize limited structural-based techniques (white-box testing) mainly in the area of Source Code Review and Security Testing. NTS Huntsville will depend heavily on specification-based techniques (black-box testing) for the individual software components. The most common specification-based techniques applied to the voting system during software testing will be "equivalence partitioning", "boundary value", and "pairwise" testing.

- "Equivalence Partitioning" will be used to evaluate specific software functions and data entry points of the voting system for valid and invalid data during the FCA. For software functions and data entry points, an entry will be made for a valid data requirement and at least one invalid data requirement to test for normal and abnormal conditions.
- "Boundary Value" testing will be used to evaluate specific software functions and data entry points for minimums and maximums during the FCA. For software functions and data entry points, an entry will be made for all minimum and all maximum documented requirements to test for normal and abnormal conditions. This technique will be used for numeric ranges as well as non-numeric ranges.

4.4.1 Software Module Test Case Design and Data (Continued)

- "Pairwise" testing is a combinatorial method of software testing that, for each pair of input parameters to a system, tests all possible discrete combinations of those parameters. NTS Huntsville uses combinatorial test design to identify the minimum number of tests needed to get the coverage required to exercise the functionality. Combinatorial test design enables testers to get greater test coverage with fewer tests. Note that "coverage", as used here, is referring to functional combinatorial coverage, not requirements coverage.

4.4.2 Software Functional Test Case Design and Data

NTS Huntsville personnel shall perform the specification-based technique used at the functional test case level entitled "Use Case." The identified actors and their responsibilities are listed in Table 4-4.

Table 4-4. "Use Case" Identified Roles and Responsibilities

Role/Actor	Responsibility
Election Administrator	Enters the election definition with translation and audio Maintains EMS users and the election database
Warehouse Technician	Loads the election definition onto the voting equipment Runs diagnostic test and maintains the units
Poll Worker	Sets up and closes down the voting equipment on election-day at the precinct location
Voter	Physically casts the ballot on election-day
ADA Voter	Votes unassisted on election-day with special needs
Election Official	Reports and audits the election result post-election day

"Use Case" is utilized during the FCA with a single pass through each component using only valid data. This pass is considered the "Master Copy" of data to be passed between interfacing points of applications during integration level testing. If a component downstream in the test process needs data from previous processes, the "Master Copy" of data can be used or altered to accelerate the test process. Known tests utilizing the "Master Copy" of data at the integration level are Security and Usability.

4.4.3 System-level Test Case Design

System-level testing examines the ability of proprietary software, hardware, and peripherals in addition to the COTS software, hardware, and peripherals to operate as a complete system. NTS Huntsville utilizes test cases designed to ensure that integrated components function as specified by the manufacturer's documentation and meet the requirements of the 2005 VVSG.

4.5 Test Specifications

The following subsections provide a brief description of the testing to be performed.

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4.5.1 Physical Configuration Audit Specifications

The Physical Configuration Audit compares the voting system components submitted for qualification to the manufacturer's technical documentation, and shall include the following activities:

- Establish a configuration baseline of software and hardware to be tested; confirm whether manufacturer's documentation is sufficient for the user to install, validate, operate, and maintain the voting system.
- Verify software conforms to the manufacturer's specifications; inspect all records of manufacturer's release control system; if changes have been made to the baseline version, verify manufacturer's engineering and test data are for the software version submitted for certification.
- If the hardware is non-COTS, NTS Huntsville will review drawings, specifications, technical data, and test data associated with system hardware to establish system hardware baseline associated with software baseline.
- Review manufacturer's documents of user acceptance test procedures and data against system's functional specifications; resolve any discrepancy or inadequacy in manufacturer's plan or data prior to beginning system integration functional and performance tests.
- Subsequent changes to baseline software configuration made during testing, as well as system hardware changes that may produce a change in software operation are subject to re-examination.

4.5.2 Functional Configuration Audit Specifications

The functional configuration audit encompasses an examination of manufacturer's tests, and the conduct of additional tests, to verify that the system hardware and software perform all the functions described in the manufacturer's documentation submitted in the TDP. In addition to functioning according to the manufacturer's documentation, tests will be conducted to ensure that requirements of Volume II section 6.7 and all other applicable EAC 2005 VVSG requirements are met. This testing is accomplished through a process called sequencing.

Sequencing is the act of navigating through the user interface to verify that the system performs as described by the manufacturer and does not violate any of the 2005 VVSG requirements. The path that the tester navigates follows the logical flow of accomplishing task required to conduct an election. For example, a task in conducting an election is to add a candidate. The tester will follow the flow of the user interface to add the candidate to a contest. If there are multiple ways to achieve this, then each method will be tested. This process will continue until all tasks for conducting an election are completed. Any paths, or combination of paths, that are determined to be at risk for failure that are outside of the normal flow of the interface will be tested on an individual basis.

4.5.3 System Integration Test Specifications

The system integration test addresses the integration of both hardware and software, along with any telecommunication capabilities. This includes connecting all supporting equipment and peripherals including ballot boxes, voting booths (regular and accessible), and any physical security equipment such as locks and ties. The testing process utilizes functional testing to execute the operations required to design an election, facilitate voting, and tabulate results.

4.5.4 TDP Evaluation Specifications

NTS Huntsville qualified personnel utilize a TDP Review Matrix which lists every EAC 2005 VVSG requirement pertaining to TDP review. NTS Huntsville will review the modified documents listed in Section 1.1.3 and other documents required to execute testing. NTS Huntsville will record the results of the review of each document to the applicable requirements listed in the TDP Review Matrix.

During the TDP review process, each document will be reviewed for completeness, clarity, correctness, and continuity. The review results will be formally reported to manufacturer. If a revised document is received, it will be re-reviewed as discussed in this section. The TDP will be continued to be reviewed during the entire testing process as these documents will be utilized to set up the systems, verify correct operational results and in other tests as needed. At the end of the TDP review process, a Deficiency Report will be issued listing the non-compliant items on a document-by-document basis, if applicable.

4.5.5 Source Code Review Specifications

Upon receipt of the source code, a SHA256 hash value will be created for each file. NTS Huntsville will verify that every line of modified source code is compliant to the 2005 VVSG coding requirements. In circumstances where the coding language facilitates the use of automated tools, NTS will develop a process for conducting the source code review with an automated tool. In addition, NTS Huntsville personnel will perform a manual 10% review of all automated source code review to verify that the automated tool was configured properly.

A technical report of all identified violations will be sent to the manufacturer for resolution per review / re-review basis. All revised source code will be checked for compliance until all issues are resolved. All iterative review results shall be included in the final test report.

Unmodified non-voting COTS software (e.g., operating systems, programming language compilers, database management systems, and web browsers) is not subject to the detailed review process specified in this section. However, NTS Huntsville personnel will use one of the following methods to verify that the COTS software has not been modified; independently download an original copy of the COTS software from a 3rd party site, obtain an original OEM disc(s), or receive an original COTS software package sent from the 3rd party manufacturer directly to NTS. Utilizing binary comparison or sha256 hash values the COTS software shall be verified as unmodified.

COTS software that has been modified by the manufacturer in any manner is subject to review. Source code generated by a COTS package and embedded in software modules for compilation or interpretation will be provided in human readable form to NTS Huntsville personnel to enable review.

4.6 Source Code Build Process

NTS Huntsville utilizes two build processes, a compliance build and a trusted build. Compliance builds for all software builds that are not required to be witnessed by the manufacturer. This build process follows the documented procedures of a “Trusted Build” in the Program Manual, with two exceptions: The image products will not be submitted to the EAC, and no manufacturer representative shall be required to be present or on-site for these builds. The “Trusted Build” process is described in section 5.6 of the EAC Program Manual and further clarified in NOC 16-02: Trusted Build.

4.7 System Identification Tools Review

System Identification tools are defined by the Program Manual as "Tools created by a Manufacturer of voting systems which allow elections officials to verify that the hardware and software of systems purchased are identical to the systems certified by the EAC." Section 2.14 of the Voting System Test Laboratory Manual requires that VSTLs test system identification tools during the test campaign to make sure they function properly and as intended. The manufacturer submitted system identification tools will be review for compliance with the 2005 VVSG Volume I Section 7.4.6 and RFI 2012-04.

4.8 QA & CM System Review

The manufacturer submitted QA Plan and CM Plan will be reviewed. The review will be limited to the changes within this modification to determine compliance with EAC 2005 VVSG Volume II Sections 2.11 and 2.12, and Volume I Sections 8 and 9, EAC stated requirements, and with the requirements of the internal manufacturer documentation. In addition, the manufacturer TDP documentation package will be reviewed to determine if the manufacturer's QA Plan and the CM Plan are being followed. The results of the TDP review shall be entered on a spreadsheet as previously described in Section 4.6 of this test plan. The results of the TDP review, including the QA and CM compliance results of the Technical Data Package Review, will be included in the final test report.

5.0 TEST DATA

5.1 Test Data Recording

All equipment utilized for test data recording shall be identified in the test data package. For hardware environmental and operational testing, the equipment shall be listed on the Instrumentation Equipment Sheet for each test. The output test data shall be recorded in an appropriate manner as to allow for data analysis. For source code and TDP reviews, results shall be compiled in output reports and submitted to the manufacturer for resolution.

Additionally, all test results, including functional test data, will be recorded on the relevant NTS Huntsville Operating Procedures and Test Cases. Results will also be recorded real-time in engineering log books. Incremental reports will be submitted to the manufacturer and the EAC at the completion of major test areas to communicate progress and results as deemed necessary by the stakeholders.

5.2 Test Data Criteria

NTS Huntsville will evaluate all test data against the manufacturer provided TDP and the requirements set forth in the EAC 2005 VVSG. Per the EAC 2005 VVSG, these parameters shall encompass the test tolerances and samples to define the minimum number of combinations or alternatives of input and output conditions that can be exercised to constitute an acceptable test of the parameters involved. The parameters will also include events with criteria defining the maximum number of interrupts, halts, or other system breaks that may occur due to non-test conditions (excluding events from which recovery occurs automatically or where a relevant status message is displayed).

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6.0 TEST PROCEDURES AND CONDITIONS

NTS Huntsville is an independent testing laboratory for systems and components under harsh environments, including dynamic and climatic extremes as well as the testing of electronic voting systems. NTS Huntsville holds the following accreditations:

- ISO-9001:2000
- NVLAP Accredited ISO 17025:2005
- EAC Accredited VSTL, NIST 150,150-22
- A2LA Accredited (Certification No.'s 0214.40, 0214.41, and 0214.42)
- FCC Approved Contractor Test Site (Part 15, 18)

6.1 Test Facilities

All testing will be conducted at the NTS Huntsville, AL facility unless otherwise noted. Environmental non-operating (storage) and operating hardware testing will be conducted utilizing an adequately sized environmental test chamber or dynamic vibration (shaker) system equipped with the required data gathering support equipment. All remaining operating hardware tests will be conducted at the appropriate test site with the required support equipment. All instrumentation, measuring, and test equipment used in the performance of this test program will be listed on the Instrumentation Equipment Sheet for each test and shall be calibrated in accordance with NTS Quality Assurance Program, which complies with the requirements of ANS/ISO/IEC 17025:2005 and ANSI/NCSL Z540.3 and ISO 10012:2003.

Standards used in performing all calibrations are traceable to the National Institute of Standards and Technology (NIST) by report number and date. When no national standards exist, the standards are traceable to international standards or the basis for calibration is otherwise documented.

Unless otherwise specified herein, all remaining tests, including system level functional testing, shall be performed at standard ambient conditions outlined in Table 6-1.

Table 6-1. Standard Ambient Conditions

Event	Ambient Range
Temperature	68 to 75 degrees (°) Fahrenheit (F)
Relative Humidity	Local Site Humidity
Atmospheric Pressure	Local Site Pressure

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6.1 Test Facilities (Continued)

The following tolerances listed in Table 6-2 shall be used unless otherwise specified herein.

Table 6-2. Test Tolerances

Phenomena	Tolerance Allowance
Temperature	± 3.6°F (2°C)
Vibration Amplitude	± 10%
Vibration Frequency	± 2%
Random Vibration Acceleration	20 to 500 Hertz ± 1.5 dB
	500 to 2000 Hertz ± 3.0 dB
Random Overall grms	± 1.5 dB
Acoustic Overall Sound Pressure Level	+4/-2 dB

Deviations to the above tolerances may be submitted by the responsible test laboratory with sufficient engineering information to substantiate the deviation request, but only when best effort technique and system limitations indicate the need for a deviation.

6.2 Test Set-up

All voting system components (hardware and software), will be received and documented utilizing NTS Huntsville Receiving Ticket (QP HSV-150, 05/04/15) and proper QA procedures. When voting system hardware is received, each test article will be unpacked and inspected for obvious signs of degradation and/or damage that may have occurred during transit. Noticeable degradation and/or damage, if present, will be recorded, photographed, and the manufacturer shall be notified. NTS Huntsville VSTL personnel will notify NTS Huntsville QA personnel that the equipment is ready for receipt inspection. QA personnel shall record the serial numbers and part numbers. Comparison shall be made between those numbers recorded and those listed on the shipper's manifest. Any discrepancies noted will be brought to the attention of the manufacturer representative for resolution. All TDP and source code modules received will be inventoried and maintained by the Project Lead assigned to testing.

For test setup, the system will be configured as it would for normal field use. This includes connecting all supporting equipment and peripherals. NTS Huntsville will properly configure and initialize the system, and verify that it is ready to be tested by following the procedures detailed in the voting system TDP.

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6.3 Test Sequence and Description

The components of the voting system will undergo testing to verify that the modification performs as described by the manufacturer and meets the requirements of the 2005 VVSG. The required functional tests are outlined in the subsections below. The sequence will follow the schedule in Appendix C – Project Schedule.

6.3.1 Physical Configuration Audit

NTS Huntsville will perform a physical configuration audit on the submitted hardware to verify that it is unmodified from the certified Unity 3.4.1.0 hardware.

6.3.2 Functional Configuration Audit

The FCA for the Unity 3.4.1.4 campaign will include review of modified elements of the ERM and HPM. The FCA tests will be designed per the specifications in Section 4.5.2 of this plan. Test cases will be crated to verify that the following modifications meet the requirements of the 2005 VVSG and the manufacturer stated operations:

- Create DS850 parameters for a Pennsylvania cross endorsed election with more than 8 candidates.
- Verify that the counters associated with Registered Voter statistics are present in the election_name.RCY file.

During the FCA, both normal and abnormal data will be input into the system to attempt to introduce errors and test for error recovery.

6.3.3 System Integration

All submitted hardware and software components will be included in the system integration test. Two elections will be created to test the voting systems ability to function as an integrated system. The design parameters of each election are included in this section.

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6.3.3 System Integration (Continued)

General Election: GEN-01

The Gen-01 is a basic election held in four precincts, one of which is a split precinct, containing nineteen contests compiled into four ballot styles. Five of the contests are in all four ballot styles. The other fourteen contests are split between at least two of the precincts with a maximum of four different contests spread across the four precincts. This election was designed to functionally test the handling of multiple ballot styles, support for at least two languages, support for common voting variations, and audio support for at least two languages.

The parameters of this election are listed below:

- Closed Primary: No
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: Yes
- Straight Party voting: Yes
- Cross-party endorsement: No
- Split Precincts: Yes
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

In addition to the parameters listed above, the following will also be tested:

- Audio input in an alternative language for basic voting pattern using an ADA device
- Audio input for write-in voting using an ADA device
- Spanish language input for a basic voting pattern
- Input for write-in voting using Spanish language

6.3.3 System Integration (Continued)

Primary Election: PRIM-01

The Prim-01 is a closed primary election in two precincts (one precinct is a split), containing thirty contests compiled into five ballot styles. Each ballot style contains six contests. This election was designed to functionally test an open primary with multiple ballot styles, support for two languages, and support for common voting variations.

The parameters of this election are listed below:

- Closed Primary: Yes
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: No
- Straight Party voting: No
- Cross-party endorsement: No
- Split Precincts: Yes
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

In addition to the parameters listed above, the following will also be tested:

- ADA audio device utilized with a write-in option

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6.3.4 TDP Review

NTS Huntsville will ensure that all submitted modifications are accurately documented and that the documents adhere to the requirements of the 2005 VVSG. A complete listing of the Unity 3.4.1.4 TDP is located in Appendix B – Technical Data Package.

6.3.5 System Identification Tools Review

NTS Huntsville will use the results of the trusted build process and the Unity 3.4.1.4 system identification tools to verify that the tools provided for HPM and ERM function as described by ES&S and meet the requirements of the Program Manual and Volume I Section 7.4.6 of the 2005 VVSG.

6.3.6 Source Code Review

All lines of source code that were modified from Unity 3.4.1.0 to Unity 3.4.1.4 will be reviewed.

6.4 Test Operations Procedure

These subsections address the procedures that NTS will follow during this modification testing campaign.

6.4.1 Pass/Fail Criteria

The PASS/FAIL criteria at the Component Level will be based on the expected result. If the System Under Test (SUT) performs as expected, the test is considered as passed. If the SUT does not perform as expected, the test will be evaluated for tester, test procedure, or test equipment errors. If it is determined there were no tester, test procedure, or test equipment errors, the test will be repeated in an attempt to reproduce the results. If the results cannot be reproduced, the anomaly will be logged and monitored throughout the test campaign and subsequent testing efforts. If the results can be reproduced and the expected results are not met, the SUT will have failed the test. NTS Huntsville personnel will document the error and track the error through resolution.

The PASS/FAIL criterion for System Level testing is whether the system can continue to operate as expected. The System Level test is considered as passed if either 1) no errors are found, or 2) an error is encountered but the system continues to operate and engineering analysis determines that the root cause does not affect system level testing. The system level test is considered failed when an error is encountered and the system is too unstable to continue or engineering analysis determines the root cause could affect further testing. If an error occurs during system level testing, the error shall be documented. If the voting system is able to recover and continue, the test will continue. If the error causes the system to become unstable, the test shall be halted. All errors documented during System Level Testing shall be tracked through resolution.

6.4.2 Anomalies

NTS Huntsville defines an anomaly as any unexpected result and/or event that deviates from what is standard, normal, or expected in which no root cause has been determined. All anomalies are logged in the NTS issue tracking system (JIRA) and monitored throughout the test campaign and subsequent testing efforts. Anomalies may become deficiencies when a root cause is established.

6.4.3 Deficiencies and Resolutions

NTS Huntsville defines a deficiency as any repeatable test result or event that is counter to the expected result or violates the specified requirements. Deficiencies are placed into JIRA and the EAC's Virtual Review Tool (VRT) for disposition and resolution. The manufacturer will be required to submit a root cause analysis and correct any deficiency before testing can be resumed. Engineering analysis will be performed to determine what effect the resolution has on the component. A determination will be made whether Regression Testing will be sufficient or a complete re-test is necessary. All deficiencies and their resolutions will be documented on the NTS Huntsville Deficiency tracking system and the EAC Virtual Review Tool.

6.4.4 Test Results and Assessment

NTS Huntsville personnel will test every EAC 2005 VVSG requirement impacted by the submitted modification. NTS Huntsville personnel will report all deficiencies discovered during this test campaign to the manufacturer and the EAC. If NTS Huntsville determines there is not enough data to ensure a requirement was met, the test plan will be altered and further testing will be done.

6.4.5 Terms of NTS Huntsville Recommendation for Certification

The EAC has the final decision as to whether the system meets all the requirements for an EAC-certified system. NTS Huntsville will recommend approval, if the modifications meet all applicable sections of the 2005 VVSG. If the modifications do not meet all applicable sections of the 2005 VVSG, NTS will report the non-conformities to EAC.

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APPENDIX A – ADDITIONAL TESTING

A.1 Manufacturer Requested Additional Testing

In addition to the modifications submitted for Unity 3.4.1.4, as described in Section 1.1.3 of this test plan, ES&S requested that additional testing be performed to verify that data can be exchanged utilizing the modified .RCY file between Unity 3.4.1.4 voting system and the voting systems previously qualified by the National Association of State Election Directors (NASED), specifically Unity 3.0.1.0 and Unity 3.0.1.1 voting systems. The Unity 3.0.1.0 and 3.0.1.1 voting systems were never tested or certified under the EAC Testing and Certification Program and hold no official status under the EAC Testing and Certification Program. Therefore, any testing, including the data exchange between the submitted Unity 3.4.1.4 system and the NASED qualified systems, is outside the scope of the EAC Testing and Certification Program.

A.1.1 Description of Testing

NTS Huntsville will follow the procedures described in the Election Reporting Manager Unity Bridge Guide dated May 5, 2016 to verify that the operations work on both the Unity 3.0.1.0 and Unity 3.0.1.1 voting systems. NTS Huntsville will perform limited testing as requested by the manufacturer.

An election definition for a general and a primary will be created in the Unity 3.0.1.1 system. This definition will be exported for use us in Unity 3.4.1.4. This exported file will be imported into to the Unity 3.4.1.4 version of HPM. Election media will be created and ballots scanned on the DS850. The results from the DS850 will be process in the Unity 3.4.1.4 version of ERM. The results will then be exported from ERM and imported into the Unity 3.0.1.1 version of ERM. The process will be repeated on the Unity 3.0.1.0 version of ERM.

Table A-1 outlines the requested testing. Figure A-1 diagrams the data interchange between Unity 3.0.1.0/3.0.1.1 and Unity 3.4.1.4.

Table A-1. Manufacturer Requested Testing Outside of Certification

Component	Version	Requested Testing
Election Reporting Manager Unity Bridge Guide	1.0	Documentation Review
Unity EMS	3.0.1.0 & 3.0.1.1	Functional Integration Test

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A.1.1 Description of Testing (Continued)

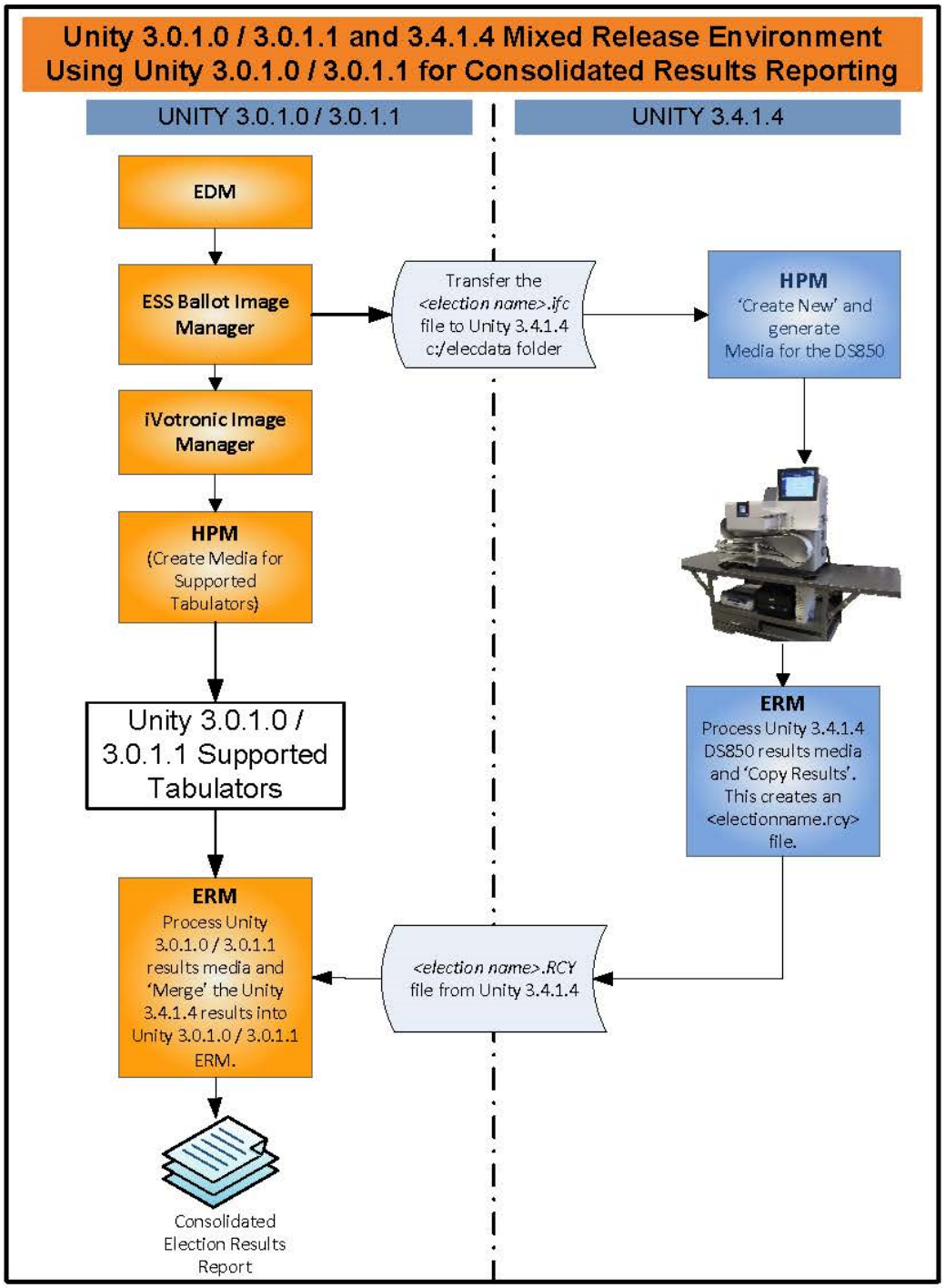

Figure A-1. Unity Bridge Diagram

APPENDIX B – TECHNCAL DATA PACKAGE

B.1 Technical Data Package

The documents listed in Table B-1 comprise the Unity 3.4.1.4 Voting System TDP.

Table B-1. Unity 3.4.1.4 TDP

Unity 3.4.1.4 TDP Documents	Version	Doc No.	Document Code
System Overview			
Voting System Overview	1.3	01-01	Unity3414_C_D_0100_SysOvr
System Functionality Description			
System Functionality Description	1.0	02-01	Unity3414_C_D_0200_SFD
System Hardware Specification			
System Hardware Specification – DS200 HW Rev 1.2	3.0	03-01	DS200HW_M_SPC_0312_HWSpec
System Hardware Specification – DS200 HW Rev 1.3	4.0	03-02	DS200HW_M_SPC_0313_HWSpec
System Hardware Specification – DS850 HW Rev 1.0	1.2	03-03	DS850HW_M_SPC_0310_HWSpec
System Hardware Specification – M100 HW Rev 1.3	3.0	03-04	M100HW_M_SPC_0313_HWSpec
System Hardware Specification – M650 HW Rev 1.1-1.2	4.0	03-05	M650HW_M_SPC_0312_HWSpec
Software Design and Specification			
ES&S Ballot Image Processing Specification	1.1	04-01	ESSSYS_D_SPC_BalImgProc
ES&S System Development Program	1.2	04-02	ESSSYS_SG_P_0400_SysDevProgram
ES&S Coding Standards	1.1	04-03	ESSSYS_D_D_0100_CodingStandards
Software Design Specifications – Audit Manager	1.0	04-04	U3414_SDS00_AM
Audit Manager County Model	N/A	04-05	U3414_SDS00_AM01_CountyModel
Software Design Specifications DS200	1.0	04-06	U3414_SDS00_DS200
Software Design Specifications DS850	1.0	04-07	U3414_SDS00_DS850
Software Design Specifications – EDM	1.0	04-08	U3414_SDS00_EDM
EDM County Model	N/A	04-09	U3414_SDS00_EDM01_CountyModel
EDM Election Model	N/A	04-10	U3414_SDS00_EDM02_ElectionModel
Software Design and Specification – ERM	1.0	04-11	U3414_SDS00_ERM
Software Design and Specification – ERM Appendices	1.0	04-12	U3414_SDS00_ERM01_Appendices
Software Design and Specification – ESSIM	1.0	04-13	U3414_SDS00_ESSIM
Software Design and Specification – HPM	1.0	04-14	U3414_SDS00_HPM
Software Design and Specification – HPM Appendices	1.0	04-15	U3414_SDS00_HPM01_Appendices
Software Design and Specification – Log monitor	1.0	04-16	U3414_SDS00_LogMonitor
Software Design Specifications M100	1.0	04-17	U3414_SDS00_M100
Software Design Specifications M650	1.0	04-18	U3414_SDS00_M650
Shared File Specifications	-	04-19	01_Shared File Specifications (Folder)
Ballot Data File Specification	N/A	04-20-01	U3414_SDS01_FS_BDF
Ballot Set Collection File Specification	N/A	04-20-02	U3414_SDS02_FS_BSC
EDMXML File Specification	N/A	04-20-03	U3414_SDS03_FS_EDMXML
EL80 File Specification	N/A	04-20-04	U3414_SDS04_FS_EL80
ESSCRYPT Functional Specification	N/A	04-20-05	U3414_SDS05_FS_ESSCRYPT
ESSDECPT Functional Specification	N/A	04-20-06	U3414_SDS06_FS_ESSDECPT
ESSXML File Specification	N/A	04-20-07	U3414_SDS07_FS_ESSXML
IFC File Specification	N/A	04-20-08	U3414_SDS08_FS_IFC
Language Data File Specification	N/A	04-20-09	U3414_SDS09_FS_LDF
M650 Output File Specification	N/A	04-20-10	U3414_SDS10_FS_M650 OUTPUT

B.1 Technical Data Package (Continued)

Table B-1. Unity 3.4.1.4 TDP (Continued)

Unity 3.4.1.4 TDP Documents	Version	Doc No.	Document Code
System Test/Verification Specification			
System Test Plan	1.0	05-01	U3414_QA_D_0500_SysTestPlan
Usability Test Reports	--	05-02	01_Usability Test Reports (folder)
ES&S AutoMARK VAT	1.X	05-02-01	AMVATHW_P_D_0510_CIFRptAMVAT
DS200 Precinct Ballot Scanner	1.2.1	05-02-02	DS200HW_P_D_0512_CIFRptDS200
System Security Specification			
Voting System Security Specification	1.0	06-01	U3414_SSS00
Security Script Description	1.1	06-02	U3414_SSS02.01_SecScriptDesc
Hardening Procedures for the Election System	1.2	06-03	U3414_SSS02_HardeningProcedures
System Operations Procedure			
Ballot on Demand Printer Setup & Printing Procedures	1.1	07-01	U3414_ESSIM02_BOD
ES&S Audit Manager User's Guide	1.1	07-02	U3414_SOP00_AM
DS200 Operator's Guide	1.0	07-03	U3414_SOP00_DS200
DS850 Operator Guide	1.0	07-04	U3414_SOP00_DS850
Election Data Manager Operator's Guide	1.1	07-05	U3414_SOP00_EDM
Election Reporting Manager User's Guide	1.1	07-06	U3414_SOP00_ERM
ES&S Image Manager User's Guide	1.1	07-07	U3414_SOP00_ESSIM
Hardware Programming Manager User's Guide	1.0	07-08	U3414_SOP00_HPM
ES&S Log monitor User's Guide	1.0	07-09	U3414_SOP00_LogMonitor
M100 Operator Guide	1.1	07-10	U3414_SOP00_M100
ES&S Model 650 System Operators Guide	1.1	07-11	U3414_SOP00_M650
System Maintenance Manuals			
DS200 Maintenance Guide	1.0	08-1	U3414_SMM00_DS200
DS850 Maintenance Guide	1.1	08-2	U3414_SMM00_DS850
M100 Maintenance Guide	1.1	08-3	U3414_SMM00_M100
ES&S Model 650 System Maintenance Guide	1.0	08-4	U3414_SMM00_M650
Personnel Deployment and Training			
Personnel Deployment and Training Program	3.0	09-01	ESSSYS_T_D_0900_TrainingProgram
Configuration Management Plan			
Configuration Management Program	2.1	10-1	ESSSYS_CM_P_1000_CMProgram
Technical Documentation Program	5.0	10-2	ESSSYS_DOC_P_1000_TDProgram
QA Program			
Manufacturing Quality Assurance Program	1.2	11-01	ESSSYS_M_P_1100 _MNFQualityAssurancePlan
Software Quality Assurance Program	2.0	11-02	ESSSYS_QA_P_1100 _SoftwareQualityAssuranceProgram

B.1 Technical Data Package (Continued)

Table B-1. Unity 3.4.1.4 TDP (Continued)

Unity 3.4.1.4 TDP Documents	Version	Doc No.	Document Code
System Change Notes			
System Change Notes	1.1	12-01	U3414_DOC_D_0100_ChangeNotes
Attachments			
Ballot Production Guide for Unity	3.0	13-01	UNITY_DOC_SOP_BPG
AMVAT AIMS			
AIMS TDP	-	14-01	AIMS_TDP (Folder)
AutoMARK Information Management System			
Cover Page	N/A	14-01-01	AIMS 3414 Sect00A Cover Page
AutoMARK Information Management System Technical Data Package			
Table of Contents	N/A	14-01-02	AIMS 3414 Sect00B TDP TOC
AIMS Requirements Trace Matrix	2	14-01-03	AIMS 3414 Sect00C Requirements Trace Matrix AQS-13-5000-203-R
AutoMARK Information Management System			
AIMS Release Notes	17	14-01-04	AIMS 3414 Sect00D Release Notes AQS-13-5002-204-R
AutoMARK Information Management System			
System Overview	12	14-01-05	AIMS 3414 Sect01 System Overview AQS-13-5002-200-R
AutoMARK Information Management System			
System Functionality	11	14-01-06	AIMS 3414 Sect02 System Functionality AQS-13-5001-201-R
AutoMARK Information Management System Hardware Specifications	11	14-01-07	AIMS 3414 Sect03 System Hardware Specification AQS-13-5000-201-R
AutoMARK Compact Flash memory Card Design Specifications	10	14-01-08	AIMS 3414 Sect04 AutoMark Compact FMC Specs AQS-13-5001-008-R
AutoMARK Information Management System Programming Specifications Details	9	14-01-09	AIMS 3414 Sect04 Programming Specifications Details AQS-13-5001-212-R
AutoMARK Information Management System Software Design Specifications	11	14-01-10	AIMS 3414 Sect04 Software Design Specifications AQS-13-5001-202-R
AutoMARK Information Management System			
Election Official's Guide	28	14-01-11	AIMS 3414 Sect05 Election Officials Guide AQS-13-5001-208-R 07
AutoMARK Information Management System			
System Operating Procedures	10	14-01-12	AIMS 3414 Sect05 System Operations Procedures AQS-13-5011-200-R

B.1 Technical Data Package (Continued)

Table B-1. Unity 3.4.1.4 TDP (Continued)

Unity 3.4.1.4 TDP Documents	Version	Doc No.	Document Code
AMVAT TDP	-	14-02	AMVAT_TDP (Folder)
PREFACE	-	14-02-01	PREFACE (Folder)
AutoMARK Release Notes	21	14-02-01-01	AutoMARK 3414 Release Notes AQS-13-5002-205-R
AutoMARK VAT Requirements Trace Matrix	2	14-02-01-02	AutoMARK 3414 Requirement Trace Matrix AQS-13-5000-003-F
AutoMARK System Change Notes	99	14-02-01-03	AutoMARK 3414 System Change Notes AQS-13-3010-001-A
AutoMARK TECHNICAL DATA PACKAGE	N/A	14-02-01-04	AutoMARK 3414 TDP TOC
SECTION 01	-	14-02-02	SECTION01 (Folder)
AutoMARK System Introduction	9	14-02-02-01	AutoMARK 3414 System Introduction AQS-13-5001-000-R
AutoMARK System Overview	12	14-02-02-02	AutoMARK 3414 System_Overview AQS-13-5002-000-S
SECTION 02	-	14-02-03	SECTION02 (Folder)
AutoMARK System Functionality	12	14-02-03-01	AutoMARK 3414 System Functionality AQS-13-5001-001-R
SECTION 03	-	14-02-04	SECTION03 (Folder)
AutoMARK System Hardware Specification	9	14-02-04-01	AutoMARK 3414 System Hardware Specification AQS-13-5000-001-F
AutoMARK 1.1-1.2 BOM	N/A	14-02-04-02	U3414_SHS01_AutoMARK1.1-1.2 BOM
AutoMARK 1.3 BOM	N/A	14-02-04-03	U3414_SHS01_AutoMARK1.3 BOM
Cables	-	14-02-04-04	Cables (Folder)
Cable Diagrams	G	14-02-04-04-01	CABLE_PHASE2
Schematics	-	14-02-04-05	Schematics (Folder)
Printer Engine Board	B	14-02-04-05-01	PEB_RevB
Power Supply Board	B	14-02-04-05-02	PSB_RevB
AutoMARK Schematics	B	14-02-04-05-03	SBC_640117-4000C-2AGP
PI211MC-B4DR Schematic	A	14-02-04-05-04	Scanner_PI211MC-B4DR May04
Gas Gauge Board	A	14-02-04-05-05	SD_GGB_REV_A
Switch Interface Board	A3	14-02-04-05-06	SIB_A3
Ultrasonic Sheet Detector	A	14-02-04-05-07	USD-A-SCH
SECTION 04	-	14-02-05	SECTION04 (Folder)
AutoMARK Ballot Image Processing Specifications	10	14-02-05-01	AutoMARK 3414 Ballot Image Processing Specification AQS-13-5002-003-S
AutoMARK Ballot Scanning and Printing Specification	9	14-02-05-02	AutoMARK 3414 Ballot Scanning and Printing Specification AQS-13-5002-007-S
AutoMARK Driver Application Programming Interface Specifications	9	14-02-05-03	AutoMARK 3414 Driver API Specification AQS-13-5000-002-F
AutoMARK Embedded Database Interface Specification	11	14-02-05-04	AutoMARK 3414 Embedded Database Interface Specifications AQS-13-5002-005-S
AutoMARK Graphical User Interface (GUI) Design Specifications	9	14-02-05-05	AutoMARK 3414 GUI Design Specifications AQS-13-5001-005-R
AutoMARK Operating Software Design Specifications	9	14-02-05-06	AutoMARK 3414 Operating Software Design Specifications AQS-13-5001-002-R

B.1 Technical Data Package (Continued)

Table B-1. Unity 3.4.1.4 TDP (Continued)

Unity 3.4.1.4 TDP Documents	Version	Doc No.	Document Code
AutoMARK Programming Specifications Details	11	14-02-05-07	AutoMARK 3414 Programming Specifications Details AQS-13-5001-011-R
AutoMARK Rapid Application Development Methodology	10	14-02-05-08	AutoMARK 3414 RAD Methodology AQS-13-5001-010-R
AutoMARK Software Design Specifications	10	14-02-05-09	AutoMARK 3414 Software Design Spec AQS-13-5001-004-S
AutoMARK Software Development Environment Specifications	10	14-02-05-10	AutoMARK 3414 Software Development Environment AQS-13-5001-006-R
AutoMARK Software Diagnostic Specifications	10	14-02-05-11	AutoMARK 3414 Software Diagnostics Specifications AQS-13-5000-004-F
AutoMARK Software Standards Specification	10	14-02-05-12	AutoMARK 3414 Software Standards Specification AQS-13-4000-000-S
SECTION 05	-	14-02-06	SECTION05 (Folder)
AutoMARK System Security Specifications	12	14-02-06-01	AutoMARK 3414 System Security Specification AQS-13-5002-001-S
AutoMARK System Security Test Cases	11	14-02-06-02	AutoMARK 3414 System Security Test Cases AQS-13-5030-005-S
AutoMARK System Security Test Procedures	10	14-02-06-03	AutoMARK 3414 System SecurityTest Procedures AQS-13-5012-000-S
SECTION 06	-	14-02-07	SECTION06 (Folder)
Environmental	-	14-02-07-01	ENVIRONMENTAL (Folder)
AutoMARK Environmental Test Cases	12	14-02-07-01-01	AutoMARK 3414 Environmental Test Cases AQS-13-5030-001-F
AutoMARK Environmental Test Plan	12	14-02-07-01-02	AutoMARK 3414 Environmental Test Plan AQS-13-5020-001-F
AutoMARK Environmental Test Procedures	12	14-02-07-01-03	AutoMARK 3414 Environmental Test Procedure AQS-13-5010-013-F
Operations & Diagnostic Log	-	14-02-07-02	OPERATIONS & DIAGNOSTIC LOG (Folder)
AutoMARK Operations and Diagnostic Log Specifications	12	14-02-07-02-01	AutoMARK 3414 Operations and Diagnostic Log Specs AQS-13-5002-004-S
AutoMARK Operations and Diagnostic Log Test Cases	11	14-02-07-02-02	AutoMARK 3414 Operations Log Test Cases AQS-13-5032-005-S
AutoMARK Operations and Diagnostic Log Test Procedures	11	14-02-07-02-03	AutoMARK 3414 Operations Log Test Procedures AQS-13-5012-004-S
SQA	-	14-02-07-03	SQA (Folder)
AutoMARk Software Quality Assurance Test Plan	10	14-02-07-03-01	AutoMARK 3414 SQA Test Plan AQS-13-5021-000-R
AutoMARK Software Quality Assurance Test Cases	12	14-02-07-03-02	AutoMARK 3414 SQA_Test_Cases AQS-13-5031-000-R
AutoMARK Software Quality Assurance Test Procedures	11	14-02-07-03-03	AutoMARK 3414 SQA_Test_Procedures AQS-13-5011-001-R
System Level Test Cases	-	14-02-07-04	SYSTEM LEVEL TEST CASES (Folder)
AutoMARK System Level Test Cases	11	14-02-07-04-01	AutoMARK 3414 System Level Test Cases AQS-13-5030-000-F

B.1 Technical Data Package (Continued)

Table B-1. Unity 3.4.1.4 TDP (Continued)

Unity 3.4.1.4 TDP Documents	Version	Doc No.	Document Code
AutoMARK System Level Test Plan	10	14-02-07-04-02	AutoMARK 3414 System Level Test Plan AQS-13-5020-002-F
AutoMARK System Level Test Procedures	10	14-02-07-04-03	AutoMARK 3414 System Level Test Procedures AQS-13-5010-000-F
SECTION 07	-	14-02-08	SECTION07 (Folder)
AutoMARK Jurisdiction Guide	14	14-02-08-01	AutoMARK 3414 Jurisdiction Guide AQS-13-5061-003-R
AutoMARK Poll Worker's Guide	15	14-02-08-02	AutoMARK 3414 Poll Workers Guide AQS-13-5061-002-R
AutoMARK Voter's Guide	14	14-02-08-03	AutoMARK 3414 Voters Guide AQS-13-5061-001-R
SECTION 08	-	14-02-09	SECTION08 (Folder)
AutoMARK System Installation and Maintenance Guide	17	14-02-09-01	AutoMARK 3414 System Installation and Maintenance Guide AQS-13-5010-001-F
SECTION 09	-	14-02-10	SECTION09 (Folder)
AutoMARK ATS Employee Training Procedure	9	14-02-10-01	ATS Employee Training Procedure AQS-13-5010-012-F
AutoMARK Personnel Deployment and Training Requirements	11	14-02-10-02	AutoMARK 3414 Personnel Deployment and Training AQS-13-5000-000-F
SECTION 10	-	14-02-11	SECTION10 (Folder)
AutoMARK VAT – Printer Engine Board Firmware Compilation Instructions	10	14-02-11-01	ATS 3414 AutoMARK PEB Firmware Compilation Instructions
ES&S AutoMARK Configuration Management Policy	10	14-02-11-02	ATS 3414 Configuration Management Policy AQS-13-2000-004-F
AutoMARK Software and Hardware Release Process	15	14-02-11-03	ATS 3414 Software and Hardware Release Process AQS-13-2011-000-R
AutoMARK Configuration Management Plan	11	14-02-11-04	AutoMARK 3414 Configuration Management Plan AQS-13-5020-000-F
AutoMARK Initial Software Installation Procedure	10	14-02-11-05	AutoMARK 3414 Initial Software Installation Procedure AQS-13-5012-008-S
ES&S AutoMARK Software and Firmware Compilation Instructions	5	14-02-11-06	AutoMARK VAT 1.3.2907 Software and Firmware Compilation Instructions
AutoMARK VAT – Version 1.3 & 1.4 Firmware, Hardware, & Windows CE Installation Instructions	5	14-02-11-07	AutoMARK VAT Firmware and Hardware Installation Instructions
AutoMARK VAT Software and Firmware Compilation Instructions	17	14-02-11-08	AutoMARK VAT Software and Firmware Compilation Instructions AQS-13-5013-000-A
Pre-Build Task List ES&S Automark(i) Applications	1.0	14-02-11-09	Unity_PreBuildTaskList_VAT_1.3.2907
Pre-Build Task List ES&S Automark(i) Applications	2.0	14-02-11-10	Unity_PreBuildTaskList_VAT_1.3.2907a
SECTION 11	-	14-02-12	SECTION11 (Folder)
AutoMARK Component Storage and Handling Procedure	10	14-02-12-01	ATS 3414 Component Storage and Handling Procedure AQS-13-5010-007-F
AutoMARK Design Review Policy	10	14-02-12-02	ATS 3414 Design Review Policy AQS-13-2000-002-F
AutoMARK Document Change and Issue Procedure	11	14-02-12-03	ATS 3414 Document Change and Issue Procedure AQS-13-5010-004-F

B.1 Technical Data Package (Continued)

Table B-1. Unity 3.4.1.4 TDP (Continued)

Unity 3.4.1.4 TDP Documents	Version	Doc No.	Document Code
AutoMARK Document Control Policy	10	14-02-12-04	ATS 3414 Document Control Policy AQS-13-2000-007-F
AutoMARK Engineering Change Request/Change Order Process	11	14-02-12-05	ATS 3414 Engineering Change Request Change Order Process AQS-13-5010-010-F
AutoMARK Engineering Development Policy	10	14-02-12-06	ATS 3414 Engineering Development Policy AQS-13-2000-003-F
AutoMARK Purchasing Procedure	10	14-02-12-07	ATS 3414 Purchasing Procedure AQS-13-5010-011-F
AutoMARK Quality Assurance Policy	10	14-02-12-08	ATS 3414 Quality Assurance Policy AQS-13-2000-001-F
AutoMARK Quality System Audit Process	10	14-02-12-09	ATS 3414 Quality System Audit Process AQS-13-2010-001-F
AutoMARK Receiving Procedure	10	14-02-12-10	ATS 3414 Receiving Process AQS-13-5010-005-F
AutoMARK System Report (Bug Reporting) Procedure	10	14-02-12-11	ATS 3414 System Bug Reporting Procedure AQS-13-5010-006-F

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APPENDIX C – PROJECT SCHEDULE

C.1 Project Schedule

Table C-1 provides the project schedule based on the estimated time to complete each task.

Table C-1. Project Schedule

Task Name	Duration	Start	Finish
Test Readiness Review (TRR)/Application approval	**10 days**	**Tue 5/31/16**	**Mon 6/13/16**
TDP Review	**20 days**	**Tue 5/31/16**	**Mon 6/27/16**
Test Plan	**40 days**	**Tue 6/14/16**	**Mon 8/8/16**
Test Plan Creation	4 days	Tue 6/14/16	Fri 6/17/16
ES&S Review	2 days	Mon 6/20/16	Tue 6/21/16
NTS Correction/Submission	1 day	Wed 6/22/16	Wed 6/22/16
EAC Review	20 days	Thu 6/23/16	Wed 7/20/16
NTS Test Plan Revision	3 days	Thu 7/21/16	Mon 7/25/16
EAC Re-Review	10 days	Tue 7/26/16	Mon 8/8/16
Source Code Review	**7 days**	**Tue 5/31/16**	**Wed 6/8/16**
Compliance Build	**2 days**	**Thu 6/9/16**	**Fri 6/10/16**
Receipt Inspection	**1 day**	**Tue 6/14/16**	**Tue 6/14/16**
System Setup	**3 days**	**Tue 6/14/16**	**Thu 6/16/16**
PCA	**3 days**	**Wed 6/15/16**	**Fri 6/17/16**
FCA	**5 days**	**Fri 6/17/16**	**Thu 6/23/16**
System Integration	**5 days**	**Fri 6/24/16**	**Thu 6/30/16**
Trusted Build	**3 days**	**Fri 7/1/16**	**Tue 7/5/16**
Test Report	**37 days**	**Tue 8/9/16**	**Wed 9/28/16**
Test Report Creation	1 day	Tue 8/9/16	Tue 8/9/16
ES&S Review	2 days	Wed 8/10/16	Thu 8/11/16
NTS Corrections/Submissions	1 day	Fri 8/12/16	Fri 8/12/16
EAC Review	20 days	Mon 8/15/16	Fri 9/9/16
NTS Test Report Revision	3 days	Mon 9/12/16	Wed 9/14/16
EAC Re-Review	10 days	Thu 9/15/16	Wed 9/28/16
Job Closeout	**1 day**	**Thu 9/29/16**	**Thu 9/29/16**

END OF TEST PLAN