Test Report for EAC 2005 VVSG Certification Testing Performed on Election Systems & Software Voting System 5.2.0.3

EAC CERTIFICATION NUMBER: ESSEVS5203

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TABLE OF CONTENTS

PAGE NO.

1.0 Introduction 5

1.1 Description of EAC Certified System Being Modified 5

1.1.1 Baseline Certified System 5

1.2 References 7

1.3 Terms and Abbreviations 8

2.0 Certification Test Background 10

2.1 Revision History 10

2.2 Scope of Testing 10

2.2.1 Modification Overview 11

2.2.2 Test Materials 13

2.2.3 Block Diagram 15

2.2.4 Supported Languages 15

2.2.5 RFIs 15

2.2.6 NOCs 16

3.0 Test Findings 16

3.1 Summary Finding 16

3.1.1 Hardware Testing 16

3.1.2 System Level Testing 16

3.1.2.1 TDP Review 16

3.1.2.2 Functional Configuration Audit (FCA) 17

3.1.3 Source Code Review 18

3.2 Anomalies 18

3.3 Deficiencies and Resolutions 19

4.0 Recommendation for Certification 19

Appendix A. Additional Findings 20

Appendix B. Deficiency report 22

Appendix C. Anomaly report 24

Appendix D. Test Plan 26

Appendix E. Technical Data Package 28

1.0 INTRODUCTION

The purpose of this National Certification Test Report is to document the findings from National Technical Systems, Inc. (NTS) certification testing of the Election Systems & Software (ES&S), herein referred to as manufacturer, Election Systems & Software Voting System 5.2.0.3 (EVS 5.2.0.3) to the requirements set forth for Voting Systems in the U.S. Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (EAC 2005 VVSG). EVS 5.2.0.3 is a modification to the previously 2005 VVSG certified EVS5200 voting system (Certification number: ESSEVS5200), and as such, was tested by NTS Huntsville based on the "modified system" requirements set forth in section 4.4.2.3 of the EAC Testing and Certification Program Manual, Version 1.0.

1.1 Description of EAC Certified System Being Modified

The following subsection describes the EAC Certified System that is baseline for the submitted modification. All information was derived from the previous Certification Test Report and/or EAC Certificate of Conformance.

1.1.1 Baseline Certified System

The baseline system for this modification is the EVS 5.2.0.0. Tables 1-1 and 1-2 describe the hardware and software/firmware versions submitted for certification testing. For a complete description of the configuration and description of the EVS 5.2.0.0 product, refer to the EVS 5.2.0.0 Test Report located on the EAC's website at http://www.eac.gov.

Table 1-1. Baseline Certified Software

Software	Software/Firmware Version
Proprietary Software	
ElectionWare	4.6.0.0
Election Reporting Manager (ERM)	8.11.0.0
ES&S Event Log Service (ELS)	1.5.5.0
Removable Media Service (RMS)	1.4.5.0
VAT Previewer	1.8.6.0
ExpressVote Previewer	1.4.0.0
COTS Software	
Adobe Acrobat Standard	11
Cerberus FTP	6.0.7.1
Microsoft Server 2008	R2 w/ SP1
Microsoft Windows 7, SP1	5.1 w/ SP1
Microsoft Visual C++ 2008 Redistributable – x64	9.0.30729
Microsoft Visual C++ 2010 x64 Redistributable	10.0.40219
Microsoft Visual C++ 2010 x86 Redistributable	10.0.40219
Microsoft .net Framework	4.5.1
Micro Focus RM/COBOL Runtime	12.06
Symantec Endpoint Protection - Small Business Edition 2013	12.1.4

1.1.1 Baseline Certified System (Continued)

Table 1-2. Baseline Certified Voting System Equipment.

Component	Hardware Version	Firmware Version
Proprietary Hardware		
ExpressVote Accessible Voting Station	1.0	1.4.0.0
DS200 Precinct Count Scanner	1.2.1, 1.2.3, & 1.3	2.12.0.0
DS850 Central Count Scanner	1.0	2.10.0.0
AutoMARK A100	1.0	1.8.6.0
AutoMARK A200 (SBC 2.0 & SBC 2.5)	1.1	1.8.6.0
AutoMARK A300 (SBC 2.0 & SBC 2.5)	1.3	1.8.6.0
Plastic Ballot Box	1.2 & 1.3	N/A
Metal Ballot Box	1.0, 1.1, & 1.2	N/A
COTS Hardware		
EMS Server – Dell	PowerEdge T710	N/A
EMS Reporting Workstation – Dell	Optiplex 980	N/A
EMS Reporting Laptop – Dell	E6410	N/A
Motorola QR Code Scanner	DS9208	N/A
Delkin USB Flash Drives	512MB, 1, 2, 4, & 8GB	N/A
Delkin Compact Flash	1GB	N/A
DS850 Report Printer	OKI B430dn & B 431dn	N/A
DS850 Audit Printer	OKI Microline 420	N/A
Avid Headphones	Avid FV 60	N/A

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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 1.0, expiration date July 2017
- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 1.0, expiration date July 2017
- 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
- Test Guidelines Documents: EMI-001A, Test Guidelines for Performing Electromagnetic Interference (EMI) Testing," and EMI-002A, "Test Procedure for Testing and Documentation of Radiated and Conducted Emissions Performed on Commercial Products"
- NTS Quality Assurance Program Manual, Revision 5
- ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment, General Requirements"
- ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment"
- EAC Requests for Interpretation (RFI) (listed on www.eac.gov)
- EAC Notices of Clarification (NOC) (listed on www.eac.gov)
- EAC Quality Monitoring Program residing on:

  http://www.eac.gov/testing_and_certification/quality_monitoring_program.aspx
- NTS Test Report No. T71379.01-01 Rev B – National Certification Test Report for Certification Testing of the Election Systems & Software EVS 5.2.0.0 Voting System
- ES&S EVS 5.2.0.0 Technical Data Package
- ES&S EVS 5.2.0.3 Technical Data Package

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1.3 Terms and Abbreviations

Table 1-3 defines all terms and abbreviations applicable to this Test Report.

Table 1-3. 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.
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.
ES&S Event Log Service	ELS	ES&S Event Log Service is a Windows Service that runs in the background of any active ES&S Election Management software application to monitor the proper functioning of the Windows Event Viewer
Election Management System	EMS	Within the EVS 5.2.0.3 voting system, the EMS is comprised of five components: ElectionWare, ERM, ES&S Event Log Service, VAT Previewer and ExpressVote Previewer.
Election Reporting Manager	ERM	EMS reporting component.
Election Systems and Software	ES&S	Identified vendor doting the equipment under test as part of this test plan.
Engineering Change Order	ECO	--
Equipment Under Test	EUT	Refers to the individual system component or multiple piece of the same component
ES&S Voting System	EVS	Proprietary equipment owned by ES&S
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.
Institute of Electrical and Electronics Engineers	IEEE	--
Intelligent Mark Recognition	IMR	Visible light scanning technology to detect completed ballot targets.

1.3 Terms and Abbreviations (Continued)

Table 1-3. Terms and Abbreviations (Continued)

Term	Abbreviation	Definition
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.
Personal Computer	PC	Computer component of the EVS 5.2.0.3 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
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 (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.
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.
Virtual Review Tool	VRT	Test campaign management software used by the EAC and vendors applying for qualification testing.
Voting System Test Laboratory	VSTL	NTS
Voluntary Voting System Guidelines	VVSG	EAC Voluntary Voting System Guidelines Version 1.0.

2.0 CERTIFICATION TEST BACKGROUND

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)

2.1 Revision History

Table 2-1 describes the version history of the submitted voting system.

Table 2-1. Voting System Revision History

System Version	Certification Type	System Modified	Certification	Certification
EVS 5.0.0.0	New System	Original	05/16/2013	ESSEVS5000
EVS 5.0.1.0	Modification	EVS 5.0.0.0	03/18/2014	ESSEVS5010
EVS 5.2.0.0	Modification	EVS 5.0.0.0	07/02/2014	ESSEVS5200
EVS 5.2.0.3	Modification	EVS 5.2.0.0	TBD	ESSEVS5203

2.2 Scope of Testing

The focus of the test campaign was to verify functionality of EVS 5.2.0.3 submitted by the manufacturer for EAC certification.

This report is valid only for the system identified in Section 2.2.2 Description of EAC Certified System Being Modified. Any changes, revisions, or corrections not listed in this report or made to the system after this evaluation are required to be submitted to the EAC for assessment.

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2.2.1 Modification Overview

Changes were made to address specific requirements for the State of Maryland, cryptographic key generation discrepancy, and other stability enhancing features. Descriptions of submitted modifications to each part of the voting system are identified below:

ElectionWare

- Changed the Maryland state profile data element in the ElectionWare Admin Database to disable the default State Results Transfer menu items in ERM.

  Due to the creation of a state specific results reporting module (EXP) for the State of Maryland, the MultiJurisdiction Rule in the Electionware admin database needed to be defaulted to False in the Maryland Rules Profile. This data element is used by ERM to control (limit) access to the generic "State Transfer" menu options within ERM as these functions will now be part of the Maryland specific EXP module. The net effect of this change is that the State Transfer Menu item in ERM will be grayed out for elections that now use the Maryland Rules Profile in Electionware. These ERM menu items will now be encapsulated in the Maryland state specific EXP module being developed for use in Maryland per specifications by the Maryland State Board of Elections.

- Included a new version of RSACRYPTO in the ElectionWare Install that ensures compatibility with the MS Crypto library used by the ExpressVote.

  The change to RSACRYPTO.EXE addresses an incompatibility between the COTS cryptography library from RSA BSAFE (v 3.0.0.1) and the Microsoft Crypto library used on the ExpressVote. The RSACrypto proprietary module is a standalone .EXE that uses the RSA BSAFE cryptography library and is called from ElectionWare and ERM for all encryption, decryption, signing and signature validation needs. The MS Crypto library expects all RSA signatures to be exactly 128 bytes in length. The RSA BSAFE library allows RSA digital signatures to be the length determined by the mathematical formula and may generate digital signatures less than 128 bytes when the leading digit(s) of the generated signature are zero. This results in a signature verification failure on the ExpressVote when processing the election definition data created by Electionware for use on the ExpressVote.

  The solution implemented is a modification to the RSACRYPTO.EXE program whereby each time an RSA signature is generated for data used by ExpressVote, the resultant signature file is checked to see if it is 128 bytes in length. If the signature file is less than 128 bytes, leading zero (0x00) bytes are pre-pended to signature file until the signature is exactly 128 bytes in length.

  The change made does not affect any other tabulation or ballot marking devices included in the EVS 5.2.0.3 release as it relates to only the signing of data that is used by the ExpressVote.

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2.2.1 Modification Overview (Continued)

ERM

- Corrected the display of the District Control File name prompt in certain reporting options tabs.

  ERM contains three reports that allow the user to create then select to use an optional control file to select one or more specific districts to include on the Names and Districts Totals Canvass and the Numbered Key (District Only) Canvass. ERM was incorrectly placing a series of 'N's in the District Control File Name prompt on the Reports Options Tab at the time of report execution for these three reports. ERM was corrected to display either a blank prompt for the District Control File Name or the name of the control file previously entered by the user when previously executing one of these three reports.

- Resolved the COBOL error that occurs when creating a Results XML File on a hardened system.

  Executing ERM on a hardened system and selecting the Create Results XML File resulted in a Cobol Runtime and ERM application error. The determined cause for error was that the file was attempting to be created in a read-only folder as specified by the hardening script. The program change redirected this work file to the proper folder where all other ERM work files are created.

- Included the new version of RSACRYPTO in the ERM Install that ensures compatibility with the MS Crypto library used by the ExpressVote.

- Eliminate the check for and rebuild of old format results and counter files.

  In order to support a customer accessing a previous election dataset that used the old format of these files when using the newer versions of the software (backwards compatibility), this function would first check a flag in the ERM Control File to determine what format of files each specific ERM election dataset contained. If ERM determined that the files were in the older format, a process was executed to read the old format of the files and convert them to the new file formats. A potential file sharing issue in the logic that reads the Control File to determine if the files need to be reformatted can cause a false positive and incorrectly initiate the file rebuild process. The results files created in the EVS family of software do not use the old format making this function unnecessary.

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2.2.2 Test Materials

EVS 5.2.0.3 proprietary software and COTS submitted by the manufacturer for testing are listed in Table 2-2. Proprietary hardware and COTS are listed in Table 2-3.

Table 2-2. Required Voting System Software

Software	Software/Firmware Version
Proprietary Software	
ElectionWare	4.6.1.0
Election Reporting Manager (ERM)	8.11.1.0
ES&S Event Log Service (ELS)	1.5.5.0
Removable Media Service (RMS)	1.4.5.0
VAT Previewer	1.8.6.0
ExpressVote Previewer	1.4.0.0
COTS Software	
Adobe Acrobat Standard	11
Cerberus FTP	6.0.7.1
Microsoft Server 2008	R2 w/ SP1
Microsoft Windows 7	5.1 w/ SP1
Microsoft Visual C++ 2008 Redistributable – x64	9.0.30729
Microsoft Visual C++ 2010 x64 Redistributable	10.0.40219
Microsoft Visual C++ 2010 x86 Redistributable	10.0.40219
Microsoft .net Framework	4.5.1
Micro Focus RM/COBOL Runtime	12.06
Symantec Endpoint Protection - Small Business Edition 2013	12.1.4

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Table 2-3. Required Voting System Equipment

Component	Hardware Version	Firmware Version
Proprietary Hardware		
ExpressVote Accessible Voting Station	1.0	1.4.0.0
DS200 Precinct Count Scanner	1.2.1, 1.2.3, & 1.3	2.12.0.0
DS850 Central Count Scanner	1.0	2.10.0.0
AutoMARK A100	1.0	1.8.6.0
AutoMARK A200 (SBC 2.0 & SBC 2.5)	1.1	1.8.6.0
AutoMARK A300 (SBC 2.0 & SBC 2.5)	1.3	1.8.6.0
Plastic Ballot Box	1.2 & 1.3	N/A
Metal Ballot Box	1.0, 1.1, & 1.2	N/A
COTS Hardware		
EMS Server – Dell	PowerEdge T710	N/A
EMS Reporting Workstation – Dell	Optiplex 980	N/A
EMS Reporting Laptop – Dell	E6410	N/A
Motorola QR Code Scanner	DS9208	N/A
Delkin USB Flash Drives	512MB, 1, 2, 4, & 8GB	N/A
Delkin Compact Flash	1GB	N/A
DS850 Report Printer	OKI B430dn & B 431dn	N/A
DS850 Audit Printer	OKI Microline 420	N/A
Avid Headphones	Avid FV 60	N/A

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2.2.3 Block Diagram

EVS 5.2.0.3 is an integrated suite of election management products. Figure 2-1 provides a visual system overview.

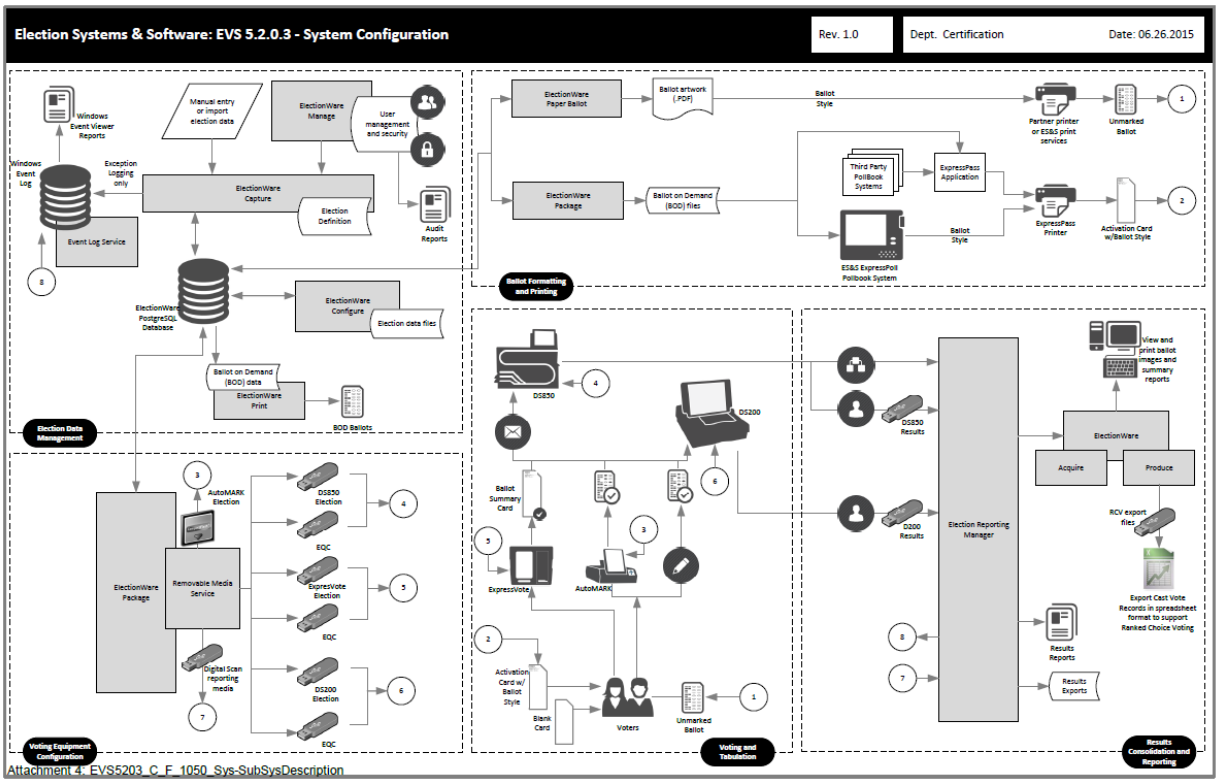

Figure 2-1. EVS 5.2.0.3 System Overview

2.2.4 Supported Languages

Supported languages remain unchanged from previously certified version.

2.2.5 RFIs

Table 2-4 lists the applicable RFIs the EAC has released as of the date of the report as it pertains to this test campaign.

Table 2-4. Applicable RFIs

RFI ID	Name
2007-02	EAC Decision on Variable Names
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
2010-08	EAC Decision on Calling Sequence
2012-04	EAC Decision on Software Setup Validation
2013-03	EAC Decision on Timestamps

2.2.6 NOCs

Table 2-5 lists the applicable NOCs the EAC has released as of the date of the report as it pertains to this test campaign.

Table 2-5. Applicable NOCs

NOC ID	Name
2008-003	EAC Conformance Testing Requirements
2009-002	Laboratory Independence Requirement
2009-005	Development and Submission of Test Plans for Modifications to EAC Certified Systems
2012-02	Clarification of System Identification Tool Functionality
2013-02	Detailed Description of Changes for Modifications

3.0 TEST FINDINGS

The EVS 5.2.0.3, as identified in Section 2.2.2 of this report, was subjected to the tests as summarized in this section.

3.1 Summary Finding

NTS Huntsville performed a TDP evaluation, Source Code Review, and a Functional Configuration Audit on EMS software of the EVS 5.2.0.3. There were no anomalies nor additional findings associated with this test campaign. A Source Code Review deficiency is listed in Section 3.1.3 and details of the deficiency which occurred during the FCA are in the Deficiency Report located in Appendix B. There are no State Test Reports included in this test report.

3.1.1 Hardware Testing

There were no hardware configuration or design changes submitted for EVS 5.2.0.3, therefore, no hardware testing was required.

3.1.2 System Level Testing

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 VVSG.

3.1.2.1 TDP Review

The EVS 5.2.0.3 TDP was reviewed to the 2005 VVSG. This review was performed as part of the testing activities. The TDP review only included the revised and new documents submitted for this testing campaign. The documents were reviewed for accuracy, completeness, and compliance to the 2005 VVSG.

The review results were recorded in a worksheet that provided the pass/fail compliance to each applicable VVSG requirement. There were six deficiencies reported to the manufacturer and internally tracked by NTS Huntsville as test exceptions until verified that the applicable documents had been corrected. The manufacturer corrected nonconformance observations and resubmitted the associated documents for review. This process continued until the TDP complied with the applicable TDP standards in the EAC 2005 VVSG.

3.1.2.1 TDP Review (Continued)

Summary Findings

There were two TDP deficiencies discovered during this test campaign. One document did not include system update data and one included information that was not a part of this test campaign.

3.1.2.2 Functional Configuration Audit (FCA)

A Functional Configuration Audit of the EVS 5.2.0.3 was performed in accordance with Section 6.7 of Volume II of the VVSG. The purpose of the FCA was to verify that the submitted modifications listed in section 2.2.1 performed as documented in the manufacturer supplied technical documentation and to validate that the modifications met the requirements of the EAC 2005 VVSG. The FCA for the EVS 5.2.0.3 campaign included elements of the EMS - ElectionWare, EMS – ERM, and EMS - RSACrypto. During the FCA, both normal and abnormal data was input into the system to attempt to introduce errors and test for error recovery.

Four test cases were run during the FCA and the results of each are outlined below.

ERM Corrected District Control File Name Prompt

NTS Huntsville performed testing to verify correction of BUG33846, related to generating the Number Key Districts Only report to ensure ERM's ability to display the correct District Control File name prompt in certain reporting options tabs.

Summary Findings

ERM performed as expected and in accordance with 2005 VVSG requirements.

ElectionWare Disable State Result Transfer Menu in ERM

NTS Huntsville performed testing to verify the functionality in the Maryland state profile data element to ensure that the ElectionWare Admin Database allows for the disabling of the default State Results Transfer menu items in ERM.

Summary Findings

The settings configured in ElectionWare performed as expected in ERM and in accordance with 2005 VVSG requirements.

ERM No COBOL Error when Creating Results XML on Hardened System

NTS Huntsville performed testing to verify correction of BUG33847, related to the COBOL error that occurs when creating a Results XML File in ERM. The test ensured that election results total files would be created in an XML format.

Summary Findings

The system performed as expected in ERM and in accordance with 2005 VVSG requirements.

3.1.2.2 Functional Configuration Audit (FCA) (Continued)

ElectionWare RSACRYPTO Scheme Compatible with ExpressVote MS Crypto Library

NTS performed testing to verify that the modifications to RSACRYPTO and ElectionWare allow for the creation of a signature file that is compatible with the MS Crypto library used by the ExpressVote.

Summary Findings

One deficiency was discovered during test where a signature mismatch error was presented on the ExpressVote. Details of the deficiency are in Appendix B – Deficiency Report. The RSACRYPTO.EXE program was modified to verify that each time an RSA signature was generated for data used by ExpressVote, the resultant signature file was 128 bytes in length. If the signature file was less than 128 bytes, leading zero (0x00) bytes were pre-pended to the signature file until the signature was exactly 128 bytes in length. Upon retest, the system performed as expected and in accordance with 2005 VVSG requirements.

3.1.3 Source Code Review

As part of testing activities, the source code submitted for the EVS 5.2.0.3 was compared to the baseline version included in the EVS 5.2.0.0. Any code changes were reviewed by NTS to determine its compliance to the 2005 VVSG and manufacturer coding standards. Three software suites were examined during this test campaign: EMS - ElectionWare, EMS – ERM, and EMS - RSACrypto.

Summary Findings

One source code deficiency was discovered during testing. The deficiency summary is in Table 3-1.

Table 3-1. Source Code Review Deficiencies

System Name	Deficiency (Type)	Deficiency (QTY)
EMS – ElectionWare	Unit Size Too Large	1
EMS - ERM	N/A	No issues
EMS - RSACrypto	N/A	No Issues

The identified source code deficiencies were resolved prior to the conclusion of the source code review process.

3.2 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 and monitored throughout the test campaign and subsequent testing efforts. Anomalies may become deficiencies when a root cause is established.

No anomalies occurred during testing of the EVS 5.2.0.3.

3.3 Deficiencies and Resolutions

One deficiency was discovered during testing of the EVS 5.2.0.3. 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 the NTS deficiency tracking system (Mantis) and the EAC's Virtual Review Tool (VRT) for disposition and resolution.

Deficiencies encountered during testing were successfully resolved prior to test completion. Deficiencies are summarized in the summary findings of the respective test section of the test report and their resolutions are presented in their entirety in Appendix B – Deficiency Report.

4.0 RECOMMENDATION FOR CERTIFICATION

NTS Huntsville performed conformance testing on the Election Systems & Software Voting System 5.2.0.3 to the EAC 2005 VVSG (Version 1.0). NTS determined that the modifications met the requirements of the EAC 2005 VVSG and the manufacturer's technical documentation. Based on test findings, NTS Huntsville recommends the EAC grant the EVS 5.2.0.3 certification to the EAC 2005 VVSG. This report is valid only for the equipment identified in Section 2.0 of this report. Due to the varying requirements of individual jurisdictions, it is recommended by the EAC 2005 VVSG that local jurisdictions perform acceptance tests on all systems prior to implementation within their jurisdiction.

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APPENDIX A. ADDITIONAL FINDINGS

This page INTENTIONALLY LEFT BLANK as there were no ADDITIONAL FINDINGS associated with this test campaign.

APPENDIX B. DEFICIENCY REPORT

B.1 DEFICIENCY REPORT

Table B-1 describes the functional deficiency and resolution discovered during the EVS 5.2.0.3 test campaign.

Table B-1. Functional Deficiency Report

EAC VRT ID[1]	Deficiency Summary	Resolutions
178	A deficiency was encountered where a signature mismatch error was presented on the ExpressVote. On run 37, tester generated ExpressVote election qualification media for the targeted poll. Inserted the EQC media into the USB port and when prompted entered the Qualification password. Tester observed the following message: "Clear and Initialize error file failed signature check" The readme.txt.rsc file on the EQC stick was examined and the size was 127 bytes not the required 128.	The solution implemented was a modification to the RSACRYPTO.EXE program when creating digital signatures specifically for the ExpressVote. Each time an RSA signature was generated for data used by the ExpressVote, the resultant signature file was checked to see if it was exactly 128 bytes in length. If the signature file was less than 128 bytes, leading zero (0x00) bytes were pre-pended to the signature file until the signature was exactly 128 bytes in length.

[1] The ID numbers may not be sequential. The deficiency tracking system (VRT) that is utilized by the EAC creates unique ID numbers based on overall entries within the database and not within individual projects.

APPENDIX C. ANOMALY REPORT

This page INTENTIONALLY LEFT BLANK as no Anomalies occurred during this test campaign.

APPENDIX D. TEST PLAN

D.1 AS-RUN TEST PLAN

No changes were made to the test plan as a result of testing.

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APPENDIX E. TECHNICAL DATA PACKAGE

E.1 EVS 5.2.0.3 TECHNICAL DATA PACKAGE

The documents listed in Table E-1 comprise the EVS 5.2.0.3 TDP.

Table E-1. EVS 5.2.0.3 TDP

EVS 5.2.0.3 TDP Documents	Version	Doc No.	Document Code
System Overview			
Voting System Overview	1.1	01-01	EVS5203_C_D_0100_SysOvr
System Functionality Description			
System Functionality Description	1.0	02-01	EVS5203_C_D_0200_SFD
System Hardware Specification			
AutoMARK System Hardware Overview	4	03-01	AutoMARK_ESS_System_Hardware _Overview_AQS-18-5002-000-S
AutoMARK System Hardware Specification	3	03-02	AutoMARK_ESS_System_Hardware _Specification_AQS-18-5000-001-F
System Hardware Specificaition-DS200 HW Rev 1.2	3.0	03-03	DS200HW_M_SPC_0312_HWSpec
System Hardware Specification-DS200 HW Rev 1.3	4.0	03-04	DS200HW_M_SPC_0313_HWSpec
System Hardware Specification-DS850 HW Rev 1.0	1.1	03-05	DS850HW_M_SPC_0310_HWSpec
System Hardware Specification-ExpressVote HW Rev 1.0	3.0	03-06	ExpressVoteHW_M_SPC_0310_HWSpec
Software Design and Specification			
AutoMARK Ballot Image Processing Specifications	11	04-01	AQS-13-5002-003-S
AutoMARK Ballot Scanning and Printing Specification	9	04-02	AQS-13-5002-007-S
AutoMARK Driver API Specification	9	04-03	AQS-13-5000-002-F
AutoMARK Embedded Database Interface Specifications	12	04-04	AQS-13-5002-005-S
AutoMARK GUI Design Specifications	10	04-05	AQS-13-5001-005-R
AutoMARK Operating Software Design Specifications	10	04-06	AQS-13-5001-002-R
AutoMARK Operations and Diagnostic Log Specifications	6	04-07	AQS-18-5002-004-S
AutoMARK Programming Specifications Details	11	04-08	AQS-13-5001-011-R
AutoMARK Software Design Specifications	10	04-09	AQS-13-5001-004-S
AutoMARK Software Design Specification Overview	1.8	04-10	AutoMARK ESS Software Design Spec Overview
AutoMARK Software Development Environment	10	04-11	AQS-13-5001-006-R
AutoMARK Software Diagnostics Specifications	10	04-12	AQS-13-5000-004-F
AutoMARK Software Standards Specification	10	04-13	AQS-13-4000-000-S
ES&S Coding Standards	3.0	04-14	ESSSYS_D_P_0400_CodingStandards
ES&S System Development Program	2.0	04-15	ESSSYS_SG_P_0400_SystemDevProgram
Software Design Specifications DS200	1.0	04-16	EVS5203_D_SDS00_DS200
Software Design Specifications DS850	1.0	04-17	EVS5203_D_SDS00_DS850
ElectionWare PostgreSQL Table and Field Descriptions	--	04-02	EVS5203_D_SDS00_ElectionWare04 _PostgreSQL Table and Field Descriptions (Folder)
ElectionWare Appendix 4: ElectionWare PostgreSQL Table and Field Descriptions	1.0	04-02-01	ElectionWare04_Readme
Software Design and Specification - ELS	1.0	04-18	EVS5203_D_SDS00_ELS
Software Design and Specification - ERM	1.0	04-19	EVS5203_D_SDS00_ERM
Software Design and Specification – ERM Appendices	1.0	04-20	EVS5203_D_SDS00_ERM01_Appendices
Software Design and Specification - ExpressVote	1.0	04-21	EVS5203_D_SDS00_ExpressVote
Software Design and Specification - ElectionWare	1.0	04-22	EVS5203_SDS00_ElectionWare
System Test/Verification Specification			
Voting System Test Plan ES&S Voting System 5.2.0.3	1.0	05-01	EVS5203_QA_D_0500_SysTestPlan
CIF Usability Test Report – DS200 1.2.1	1.2.1	05-02-02	DS200HW_P_D_0512_CIFRptDS200
CIF Usability Test Report – ExpressVote 1.0	--	05-02-03	ExpressVoteHW_P_D_0509_CIFRptExpressVote
CIF Usability Test Report – AutoMARK (VAT)	1.X	05-02-01	AMVATHW_P_D_0510_CIFRptAMVAT

E.1 EVS 5.2.0.3 TECHNICAL DATA PACKAGE (CONTINUED)

Table E-1. EVS 5.2.0.3 TDP (Continued)

EVS 5.2.0.3 TDP Documents	Version	Doc No.	Document Code
System Security Specification			
AutoMARK System Security Specification	6	06-01	AutoMARK ESS System Security Specification AQS-18-5002-001-S
System Security Specification	1.2	06-02	EVS5203_CM_SPC00_SysSecuritySpec
Hardening Procedures for ES&S	1.0	06-03	EVS5203_CM_SPC01_HardeningProcedures
Security Script Description	1.0	06-04	EVS5203_CM_SPC02_SecScriptDesc
System Operations Procedure			
Network Setup Guide	1.0	07-01	EVS5203_CM_SOP_NetworkConfigGuide
System Operations Procedures – AutoMARK	1.0	07-02	EVS5203_DOC_SOP_AMVAT
System Operations Procedures – DS200	1.0	07-03	EVS5203_DOC_SOP_DS200
System Operations Procedures – DS850	1.0	07-04	EVS5203_DOC_SOP_DS850
System Operations Procedures – Event Log Service	1.0	07-05	EVS5203_DOC_SOP_ELS
System Operations Procedures – Election Reporting Manager	1.0	07-06	EVS5203_DOC_SOP_ERM
ElectionWare Administrator's Guide	1.0	07-07	EVS5203_DOC_SOP_EW01Admin
ElectionWare Define: User's Guide	1.0	07-08	EVS5203_DOC_SOP_EW02Define
ElectionWare Design: User's Guide	1.0	07-09	EVS5203_DOC_SOP_EW03Design
ElectionWare Deliver: User's Guide	1.0	07-10	EVS5203_DOC_SOP_EW04Deliver
ElectionWare Results: User's Guide	1.0	07-11	EVS5203_DOC_SOP_EW05Results
System Operations Procedures – ExpressPass	1.0	07-12	EVS5203_DOC_SOP_ExpressPass
System Operations Procedures – ExpressVote	1.0	07-13	EVS5203_DOC_SOP_ExpressVote
System Maintenance Manuals			
System Maintenance Manual – ES&S AutoMARK	1.0	08-1	EVS5203_DOC_SMM_AMVAT
System Maintenance Manual – ES&S DS200	1.0	08-2	EVS5203_DOC_SMM_DS200
System Maintenance Manual – ES&S DS850	1.0	08-3	EVS5203_DOC_SMM_DS850
System Maintenance Manual – ES&S ExpressVote	1.0	08-4	EVS5203_DOC_SMM_ExpressVote
Personnel Deployment and Training			
Personnel Deployment and Training Program	3.0	09-01	ESSSYS_T_D_0900_TrainingProgram
Configuration Management Plan			
Configuration Management Program	2.0	10-1	ESSSYS_CM_P_1000_CMProgram
Technical Documentation Program	5.0	10-2	ESSSYS_DOC_P_1000_TDProgram
QA Program			
Manufacturing Quality Assurance Plan	2.0	11-01	ESSSYS_M_P_1100_MNFQualityAssurancePlan
Software Quality Assurance Program	2.0	11-02	ESSSYS_QA_P_1100_SoftwareQualityAssuranceProgram
Software/Firmware Acceptance	2.0	11-03	ESSSYS_QA_L_1100_ SoftwareFirmwareAcceptance
System Change Notes			
System Change Notes	1.0	12-01	EVS5203_DOC_D_1200_ChangeNotes
Other TDP Documents			
ES&S Ballot Production Handbook	1.0	13-01	EVS5203_DOC_SOP_BPG