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TEST REPORT

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NATIONAL CERTIFICATION TEST REPORT FOR CERTIFICATION TESTING OF THE UNISYN VOTING SOLUTIONS, INC OPENELECT VOTING SYSTEM VERSION 1.2

for

Unisyn Voting Solutions, Inc.
2310 Cousteau Court
Vista, CA 92018

STATE OF ALABAMA
COUNTY OF MADISON }

Robert D. Hardy, Department Manager, being duly sworn, deposes and says: The information contained in this report is the result of complete and carefully conducted testing and is to the best of his knowledge true and correct in all respects.

Robert Hardy

SUBSCRIBED and sworn to before me this 4 day of December 13

SEAL

Notary Public in and for the State of Alabama at Large

My Commission expires 3/19/16

Wyle shall have no liability for damages of any kind to person or property, including special or consequential damages, resulting from Wyle's providing the services covered by this report.

PREPARED BY: Stephen Han 12/3/13
Stephen Han, Project Engineer — Date

APPROVED BY: Frank Padilla 12-3-13
Frank Padilla, Voting Systems Supervisor — Date

WYLE Q. A.: Brenda Mann 12/4/13
FOR Rick Davis, Q. A. Manager — Date

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NVLAP LAB CODE 200771-0

			REVISION: Rev A
wyle laboratories			**REPORT NO.** T70987.01-01
			DATE: December 3, 2013
REV	**DATE**	**PAGE OR PARAGRAPH AFFECTED**	**DESCRIPTION OF CHANGES**
---	10-29-13	Entire Document	Original Document Release
A	12-2-13	Section 1.1	Updated paragraph to include brief summary of changes within modification
A	12-2-13	Section 2.2	Update to include processors, corrected spelling of "portable", and changed "consist" to "has"
A	12-2-13	Section 2.4	Updated paragraph to include "Wyle verified"
A	12-2-13	Section 3.2	Updated wording in paragraph for clarity
A	12-2-13	Section 3.5	Update to include definition of "DRE" and "ILTS"
A	12-2-13	Section 4.1	Update to section to correct tense, include TDP location, and clarification of code review percentage
A	12-2-13	Section 4.1.1	Update to Table removing "Test OVO on the new portable ballot box" and included clarification of equipment removed
A	12-2-13	Section 4.4	Update to section to include clarification on additional testing and re-use
A	12-2-13	Section 4.5.4	Update to include additional clarification on reliability test
A	12-2-13	Section 4.5.5	Update to section removing "pre-testing" and clarification of PCA results in summary findings

			REVISION: Rev A
wyle laboratories			**REPORT NO.** T70987.01-01
			DATE: December 3, 2013
REV	**DATE**	**PAGE OR PARAGRAPH AFFECTED**	**DESCRIPTION OF CHANGES**
A	12-2-13	Section 4.6	Update to section to include resolutions for each NOA
A	12-2-13	Section 4.7	Section removed based on resolutions of NOA's provided within section 4.6
A	12-2-13	Appendix A	Removed "DTS" and replaced with "Decline to State"

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APPENDICES

1.0 INTRODUCTION

1.1 Testing Scope

This report presents the procedures followed and the results obtained during certification testing of the Unisyn Voting Solutions, Inc., OpenElect Voting System (OVS), Version 1.2. Previous versions of this system, Unisyn OVS, Versions 1.0, 1.0.1, and 1.1 were fully tested to the EAC 2005 VVSG. As a result of this testing, Unisyn OVS Versions 1.0, 1.0.1, and 1.1 were granted certification under EAC Certification Numbers UNS10121966-OE, UNS10121966-OE-WI, and UNS10121966-OE-1.1. Since that time, Unisyn Voting Solutions has incorporated modifications to the certified 1.1 system, resulting in the release of the Unisyn OVS, Version 1.2. The system modifications will include both hardware and software upgrades from the previously-certified system. A full detailed listing of the modifications is presented in Appendix A.

The following items listed summarize the modifications of the OpenElect Voting System (OVS), Version 1.2 system.

1. OpenElect Central Suite (OCS) Election Management System (EMS) – Software upgrades and Hardware upgrades
2. OpenElect Voting Optical (OVO) – Software Upgrades and introduction of the portable ballot box
3. OpenElect Voting Interface (OVI-7) – Software Upgrades
4. OpenElect Voting Interface (OVI-VC) – Hardware and Software Upgrades
5. OpenElect Voting Central Scan (OVCS) – Software Upgrades

This modification includes the addition of key items to base level functionality that improves the general usability of the system for both current and potential customers. These additions include improved flexibility of generating ballot PDFs, including adding of custom artwork to ballots, increasing the number of layout options for candidate data, allowing both left or right hand side targets, improving the efficiency for loading election data on the in-precinct units, improving the look and usability of election night reports, and enhancing generally the usability of the system. Hardware changes were introduced to the OVI-VC, and a new collapsible portable ballot box was introduced for the OVO.

The full system details for the previous test campaigns, including system, performance, security, telecommunication, usability, system verification, and TDP deliverables can be reviewed in the EAC test reports "Unisyn Voting Solutions, Inc., OpenElect Voting System Version 1.0 VSTL Certification Test Report Revision B," "Unisyn Voting Solutions, Inc., OpenElect Voting System Version 1.0.1 VSTL Certification Test Report Revision A," and "Unisyn Voting Solutions, Inc., OpenElect Voting System Version 1.1 VSTL Certification Test Report Revision A" all of which are listed on the EAC website (listed on www.eac.gov).

1.2 Objective

The objective of this system modification test program was to ensure that the **Unisyn OVS, Version 1.2** complied with the hardware and software requirements of the EAC 2005 VVSG. The scope and detail of the requirements tested in the certification were selected to correspond to the scope of the system detailed in the application submitted by Unisyn Voting Solutions. An in-depth examination of the system further confirmed the applicable requirements selected for compliance testing. This included the inspection and evaluation of system documentation, and the execution of functional tests to verify system performance and function under normal/abnormal conditions.

1.0 INTRODUCTION (Continued)

1.3 Test Report Overview

This test report consists of five main sections (including appendices):

- **Introduction:** Provides the architecture of the National Certification Test Report (hereafter referred to as Test Report); a brief overview of the testing scope of the Test Report; a list of documentation, customer information, and references applicable to the voting system hardware, software, and this test report.
- **System Identification and Overview:** Provides information about the system tested that includes the system under test, test support hardware, and specific documentation provided by the vendor used to support testing.
- **Certification Test Background**: Contains information about the certification test process and the system tested.
- **Test Findings and Recommendation:** Provides a summary of the results of the testing process.
- **Appendices:** Information and data supporting testing of the voting system and hardware analysis are included as appendices to this report. This includes: System Modifications, Notices of Anomaly, Test Setup Photographs, Hardware Test Results, Deficiency Report, and the "As Run" Test Plan.

1.4 Customer

Unisyn Voting Solutions, Inc.
2310 Cousteau Court
Vista, CA 92018

1.5 References

The documents listed below were utilized to perform certification testing:

- Unisyn Voting Solutions, Inc's. Purchase Order No. 004002
- Wyle Laboratories' Quotation No. 545/053368/DB
- Wyle Laboratories' Certification Test Plan No. T58650-01 Rev A, dated November 17, 2011
- 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, effective date January 1, 2007
- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 1.0, effective date July 2008
- 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

1.0 INTRODUCTION (Continued)

1.5 References (Continued)

- Wyle Laboratories' Test Guidelines Documents: EMI-001A, "Wyle Laboratories' 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"
- Wyle Laboratories' Quality Assurance Program Manual, Current Revision
- 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 (listed on www.eac.gov)
- EAC Notices of Clarification (listed on www.eac.gov)
- EAC Quality Monitoring Program residing on:

  http://www.eac.gov/testing_and_certification/quality_monitoring_program.aspx
- Unisyn Voting Solutions, Inc., OpenElect Voting System Version 1.0 VSTL Certification Test Report Revision B (listed on www.eac.gov)
- Unisyn Voting Solutions, Inc., OpenElect Voting System Version 1.0.1 VSTL Certification Test Report Revision A (listed on www.eac.gov)
- Unisyn Voting Solutions, Inc., Open Elect Voting System Version 1.1 Technical Data Package
- Unisyn Voting Solutions, Inc., OpenElect Voting System Version 1.1 VSTL Certification Test Report Revision A (listed on www.eac.gov)

2.0 SYSTEM IDENTIFICATION AND OVERVIEW

2.1 System Overview

The Unisyn OVS, Version 1.2 Voting System is a modification to the certified "Unisyn Voting Solutions, Inc., OpenElect Voting System Version 1.0 VSTL Certification Test Report Revision B," "Unisyn Voting Solutions, Inc., OpenElect Voting System Version 1.0.1 VSTL Certification Test Report Revision A," and "Unisyn Voting Solutions, Inc., OpenElect Voting System Version 1.1 VSTL Certification Test Report Revision A," all of which are listed on the EAC website (listed on www.eac.gov). The Unisyn OVS, Version 1.2 Voting System includes modifications to all components listed below.

The Unisyn OVS, Version 1.2 Voting System is a paper-ballot based, optical scan voting system. The Unisyn OVS, Version 1.2 Voting System hardware consists of five major components:

1. The OpenElect Central Suite (OCS)
2. OpenElect Voting Optical Scan (OVO)
3. OpenElect Voting Interface (OVI-VC)
4. OpenElect Voting Interface (OVI-7)
5. OpenElect Voting Central Scan (OVCS)

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.1 System Overview (Continued)

The Unisyn Voting System Technical Data Package was the source for much of the summary information that follows in this section.

1. Election Management System

The Unisyn OVS, Version 1.2 OCS consists of ten components running as either a front-end/client application or as a back-end/server application. Below is a list and brief description of each:

- OCS Installer – Facilitates installation of OCS applications onto computers
- Ballot Layout Manager – Provides tools for designing and developing elections and ballots
- Election Manager – Sets election options, adds sounds to an election, exports completed elections, and uploads machine logs
- Election Server – Sets the correct system time and loads elections onto OVO and OVI machines
- Software Server – Updates and validates software on OVO and OVI machines
- Tabulator (Monitor) – Aggregates election results tabulated by OVO and OVCS machines
- Tabulator Reports –Produces election reports from tabulated election data
- Tabulator Client –Imports tabulated election data from OVO units using Transport Media
- Adjudicator – Allows a jurisdiction to evaluate ballots with questionable markings and change them if needed, in accordance with the perceived intent of the voter
- OpenElect Voting Central Scan – Application used for high speed scanning of ballots

2. OpenElect Voting Optical Scan (OVO)

The OVO is an optical scan voting machine used as a precinct tabulator. The OVO accepts full size ballots that are hand marked by voters or paper ballots printed by the OVI-7 or the OVI-VC units. The OVO has a VIA 386 processor, LCD touchscreen used for viewing directions given by the OVO as well as performing administrative functions, a plastic or portable ballot box which accepts the ballots read into the OVO, a printer used to print voter receipts and reports, and an Uninterruptible Power Supply (UPS).

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.1 System Overview (Continued)

2. OpenElect Voting Optical Scan (OVO) (Continued)

Photograph No. 1: OVO (on Plastic Ballot Box)

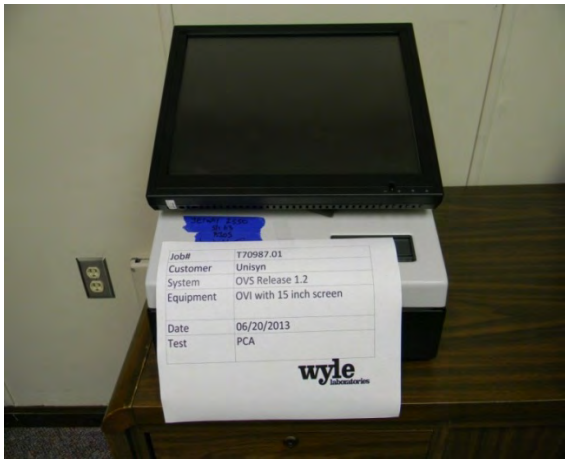
Photograph No. 2: OVO (on Portable Ballot Box)

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.1 System Overview (Continued)

3. OpenElect Voting Interface (OVI-VC)

The OVI-VC is a ballot marking device that supports Multiple Ballot Styles within a single election and supports both ADA and Early Voting requirements. The OVI-VC accepts input from the voter on a 15-inch full-color Liquid Crystal Display (LCD) touchscreen, an attached Audio Tactile Interface (ATI) keypad, or a binary input such as a Sip and Puff device. The OVI-VC has an Intel Atom processor, a printer used to produce marked ballots for scanning by an OVO and/or OVCS unit as well as reports, and an Uninterruptible Power Supply (UPS).



Photograph No. 3: OVI-VC (with 15” screen)

4. OpenElect Voting Interface (OVI-7)

The OVI-VC is a ballot marking device that supports Multiple Ballot Styles within a single election and supports both ADA and Early Voting requirements. The OVI-7 accepts input from the voter on a 7 inch full-color Liquid Crystal Display (LCD) touchscreen, an attached Audio Tactile Interface (ATI) keypad, or a binary input such as a Sip and Puff device. The OVI-7 has VIA 386 processor, a printer used to produce marked ballots for scanning by an OVO and/or OVCS unit as well as reports, and an Uninterruptible Power Supply (UPS).

Photograph No. 4: OVI-7 (with 7” screen)

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.1 System Overview (Continued)

5. OpenElect Voting Central Scan (OVCS)

The OVCS is a central count solution which consists of a Canon ImageFORMULA DR-X10C high speed scanner operated by an OVCS client application. The OVCS uses a standard 3-prong AC power cord. The OVCS high speed scanner will accept 11 inch, 14 inch, 17 inch , 19 inch and OVI ballots.

Photograph No. 5: OVCS

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.1 System Overview (Continued)

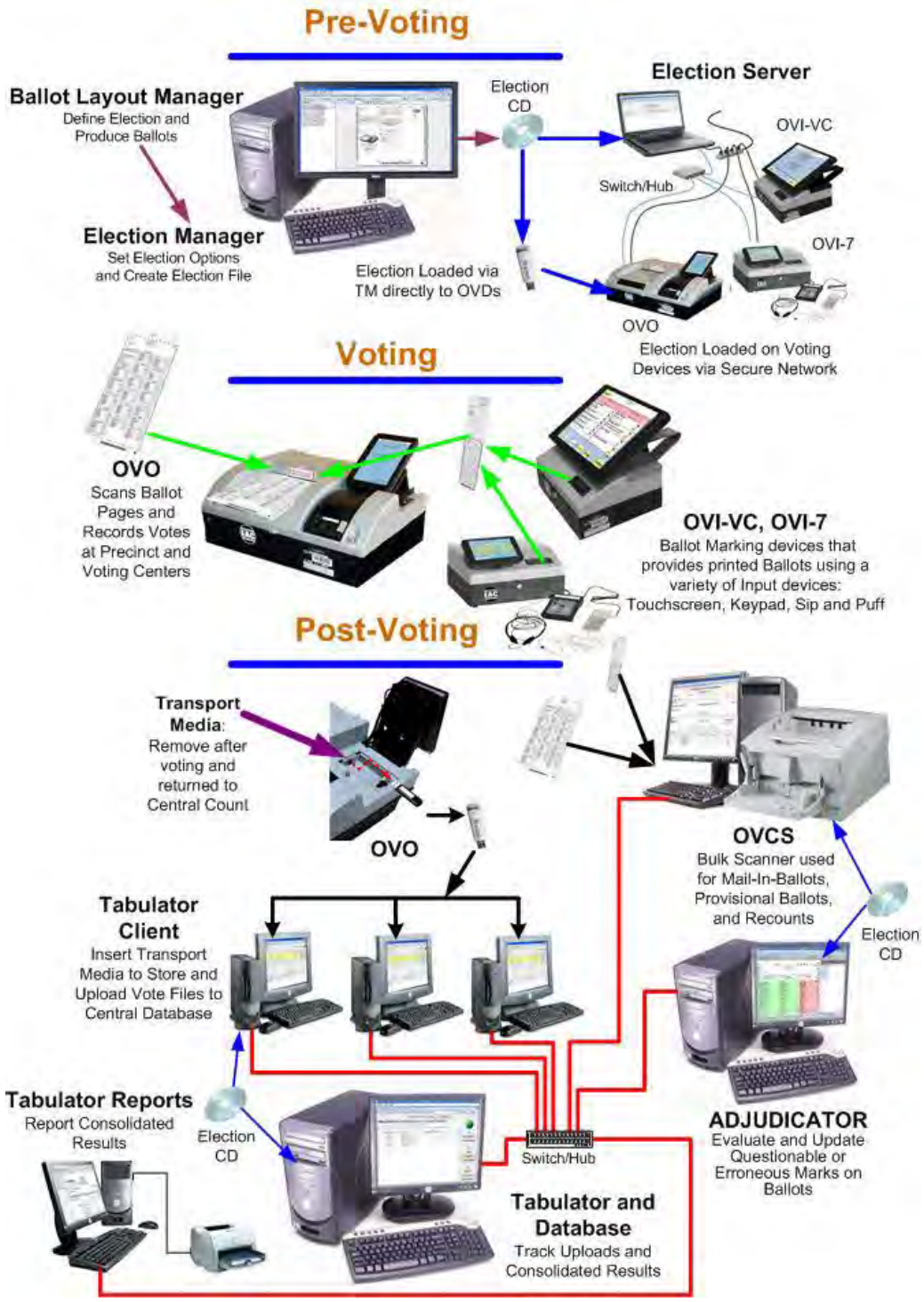

Figure 1
System Overview Diagram

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.2 System Limits

Table 2-1 Unisyn OVS 1.2 System Limits

Limit (Max # of)	Value
Elections	8
Precincts	2000
Splits per Precinct	9
Districts	400
Contest per District	20
Parties	24
Parties in Primary	12
Parties w/ Straight Ticket	12
District types	25
Languages	15
Ballot styles per Election	400
Contests per Election	150
Measures per Election	30
Instruction Blocks per Election	5
Headers per Election	50
Candidates per Contest	120
Ballot Pages	3
Vote for N of M	25
Ballots sheets per OVO	5000
Units simultaneously loading	20
Precincts initialized per OVO on Election Day	30
Precincts initialized per OVI/OVI-VC on Election Day	2000
Precincts initialized per OVO/OVI/OVI-VC in early voting	2000

Table 2-2 Unisyn OVS 1.2 Ballot Target Limits

Ballot Length	Maximum Positions (Row x Column)
11 inch	38 x 3
14 inch	50 x 3
17 inch	62 x 3
19 inch	70 x 3

2.3 Software

Table 2-3 presents the software the manufacturer submitted for testing. This includes all software required for operation and testing of the voting system being certified and software used for testing security and system integration; as well as supporting software required for the test environment including compilers, assemblers, and database managers, etc. Both COTS and non-COTS software components are listed.

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-3 Software Submitted for Testing

Software Required For Testing	Software Version
Proprietary Software	
Adjudicator	1.2.0
Ballot Layout Manager	1.2.0
Common (Library)	1.2.0
Election Manager	1.2.0
Election Server	1.2.0
OCS Installer	1.2.0
Regkey Builder	1.2.0
Software Server	1.2.0
Tabulator	1.2.0
Tabulator Client	1.2.0
Tabulator Reports	1.2.0
OVCS Application	1.2.0
OVI Firmware	1.2.0
OVO Firmware	1.2.0
Scripter	1.2.0
Validator	1.2.0
Logger (Library)	1.2.0

Table 2-4 OCS and OVCS COTS Software Descriptions

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Java SE Development Kit	Development Kit 6 Update 2 for Linux	jdk-6u2-linux-i586.bin	6a488cb0a161a1c3a541a66e3b076f8e
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73a5ed204bca01e7a
PDI Scanner Driver and Libraries for OVCS	2.1.3	PS3_Canon_libraries_2013 Oct07A.zip	da0d643d9f5d4129c5fba2709ffb6d2f

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-5 COTS Operating System Software Descriptions

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Linux CentOS Distribution for OVS 1.2 (used for the OVO/OVI-7 with old motherboard)	5.0	CentOS-5.0-i386-bin-1of6.iso CentOS-5.0-i386-bin-2of6.iso CentOS-5.0-i386-bin-3of6.iso CentOS-5.0-i386-bin-4of6.iso CentOS-5.0-i386-bin-5of6.iso CentOS-5.0-i386-bin-6of6.iso	f749d7e17fa01604b9956304efba2333; 963258ceafda5c5e6f79be86028b6b3d; a08ec9ccfdc89c24f3d6567219f90c42; b31c239009b780d1c89c311c192e43be; 0c3990be2271bf44c1495aa0003b5552; 9e6f91a5292f46b02777133765fc03fe
Linux CentOS Distribution (used for the OCS and OVCS)	5.7	CentOS-5.7-i386-bin-DVD-1of2.iso	**SHA-1:** 053e5bae5b4e23d6a9f5395acd483ef24 2369296a51430db10da9096243d78a7
Linux CentOS Distribution (used for the OVI-VC with new motherboard)	6.3	CentOS-6.3-i386-bin-DVD1.iso	0285160d8ba3cfc720ea55e98e464eac

Table 2-6 OVO Third-Party Software (COTS) Descriptions

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Common Files			
Java SE Runtime Environment	Runtime Environment 6 Update 2	jre-6u2-linux-i586.bin	0d30636b5cd23e161da5eda9409f02d5
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73a5ed204bca01e7a
Apache Tomcat	6.0.13	apache-tomcat-6.0.13.tar.gz	50442a96332f0ec0cc1fba354f733ad6
PDI Scanner Driver and Libraries for OVO	6.3.32	PS3_Canon_libraries_2013Oct07A.zip	da0d643d9f5d4129c5fba2709ffb6d2f
Citizen Printer for OVO	1.11.2.7	CSA_JPOS11127_setupEN.bin	d150d08693bf7dbe758adfdab94f655d
Jetway J7F2			
openChrome Video Driver	0.2.900-7.el5	xf86-video-openchrome-0.2.900.tar.gz	3e36895eb4b4d61e21aa27d370f151c8
eGalax Touchscreen Driver	3.00.3719	eGalaxTouch-3.00.3719-32b-k26.tar.gz	51c835408093ccfc4055a9eab9537998
FVWM Desktop Window Manager	2.4.19	fvwm-2.4.19.tar.gz	a2fd2c07061303883d6bf89eb2b259ff

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-7 OVI-7/OVI-VC Third-Party Software (COTS) Descriptions

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Common Files			
Java SE Development Kit	Development Kit 6 Update 2 for Linux	jdk-6u2-linux-i586.bin	6a488cb0a161a1c3a541a66e3b076f8e
Java SE Runtime Environment	Runtime Environment 6 Update 2	jre-6u2-linux-i586.bin	0d30636b5cd23e161da5eda9409f02d5
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73a5ed204bca01e7a
RXTX - Library and Jar	2.1-7r2	rxtx-2.1-7-bins-r2.zip	5f21ae633602a24fd3cdd096951476c2
Jetway J7F2			
openChrome Video Driver	0.2.900-7.el5	xf86-video-openchrome-0.2.900.tar.gz	3e36895eb4b4d61e21aa27d370f151c8
eGalax Touchscreen Driver	3.00.3719	eGalaxTouch-3.00.3719-32b-k26.tar.gz	51c835408093ccfc4055a9eab9537998
FVWM Desktop Window Manager	2.4.19	fvwm-2.4.19.tar.gz	a2fd2c07061303883d6bf89eb2b259ff
Jetway 2550			
Xenarc Touchscreen Driver	2.5.2107	eGTouch_v2.5.2107.L-x.tar.gz	cfb148b3997257ed0e4a8eb3fa6b3932
Linux Kernel	3.4.13	linux-3.4.13.tar.bz2	9c850d00c898ba792f29eb6a5973961c

Table 2-8 Linux Build Machine Third-Party (COTS) Software Descriptions

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Java SE Development Kit	Development Kit 6 Update 2 for Linux	jdk-6u2-linux-i586.bin	6a488cb0a161a1c3a541a66e3b076f8e
Java 2 Enterprise Edition	1.3.01	j2sdkee-1_3_01-linux.tar.gz	224e9687c73ba48f1186e434368ec9b3
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73a5ed204bca01e7a
Apache Ant	1.7.0	apache-ant-1.7.0-bin.zip	ac30ce5b07b0018d65203fbc680968f5
Jasper Reports	2.0.5	jasperreports-2.0.5-project.zip	b80bd29e4f95f18bd15da65cfd45d1d2
SQL Connector	5.1.7	mysql-connnector-java-5.1.7.zip	f9a8008367f5b25bdec045c54100d5b0
Apache Axis	1.4	axis-bin-1_4.zip	9eda42bf82a274349f18c5affdd93608
Apache Commons Codec	1.3	commons-codec-current.zip	c30c769e07339390862907504ff4b300
Apache Commons Http	3.0	commons-httpclient-3.0.zip	42d96b0c7d627a2170fd57280476c8fe
Apache Commons File Upload	1.2	commons-fileupload-1.2-bin.zip	6fbe6112ebb87a9087da8ca1f8d8fd6a
Apache Commons IO	1.3.2	commons-io-1.3.2-bin.zip	ba31cc4a0d85842e4b0bfdf2472382ba
Apache Tag Library	1.1.2	jakarta-taglibs-standard-current.zip	f75c964f1b276b022c24a677ccc17d4d
PDF Help	4.92b23	pdfhelp.jar	f2542f332e5be4549a48f876d63ac915
Javazoom MP3	1.9.4	mp3spi1.9.4.zip	e259e7674d9b19e76f005cee2810e7f5

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Software (Continued)

Table 2-8 Linux Build Machine Third-Party (COTS) Software Descriptions (Continued)

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Citizen Printer for OVO	1.11.2.7	CSA_JPOS11127_setup EN.bin	d150d08693bf7dbe758adfdab94f655d
PDI Scanner Driver and Libraries for OVO and OVCS	2.1.3, 6.3.32	PS3_Canon_libraries_ 2013Oct07A.zip	da0d643d9f5d4129c5fba2709ffb6d2f
RXTX - Library and Jar	2.1-7r2	rxtx-2.1-7-bins-r2.zip	5f21ae633602a24fd3cdd096951476c2
PDI Tool For Verification of Binary File	1.0	VisionX_11202008.EXE	af8905f015c7d7ff730b9f8b0811134b
Fonts for OCS	None	arial.ttf; ARIALBD.ttf; arialbi.ttf; ariali.ttf	124a965ffc59a680c2c20c69c2984032; 579b22c15b24dde38e737ce69ba4e993; a8370703cb6d5424597f6a4651822726; b94c4d211e303045e15c8938d869bf61
Star 700II Printer	1.4.2_11-b06	starjavapos_linux_20070 317.zip	172b1fcfecae654b00463be74efc7fbb

2.4 Hardware

The equipment the manufacturer submitted for testing is listed in Tables 2-9 through 2-16. Each test element is included in the list of the equipment required for testing of that element, including system hardware, general purpose data processing and communications equipment, and any required test instrumentation. Wyle verified that the COTS equipment had not been modified for use. Wyle performed research using the COTS equipment manufacturers' websites based on the serial and service tag numbers for each piece of equipment and to evaluate COTS hardware, system software and communications components for proven performance in commercial applications other than elections. For PCs, laptops, and servers, the service tag information was compared to the system information found on each machine. Hard drives, RAM memory, and other components were examined to verify that the components matched the information found on the COTS equipment manufacturers' websites.

Table 2-9 OVO Equipment

Equipment	Manufacturer	Model	Serial Number
OVO	Unisyn	OpenElect Voting Optical	UNI000006
OVO	Unisyn	OpenElect Voting Optical	UNI000049
OVO	Unisyn	OpenElect Voting Optical	UNI000029
OVO	Unisyn	OpenElect Voting Optical	UNI000040
OVO	Unisyn	OpenElect Voting Optical	UNI000041
OVO	Unisyn	OpenElect Voting Optical	UNI000018
OVO	Unisyn	OpenElect Voting Optical	UNI000044

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.4 Hardware (Continued)

Table 2-9 OVO Equipment (Continued)

Equipment	Manufacturer	Model	Serial Number
OVO Ballot Box	Unisyn	Plastic	BB-58650-001
OVO Ballot Box	Unisyn	Plastic	T70987-BB-001
OVO Ballot Box	Unisyn	Portable	T70987-CBB001

Table 2-10 OVI Equipment

Equipment	Manufacturer	Model	Serial Number
OVI-7	Unisyn	OpenElect Voting Interface	UNI150010
OVI-7	Unisyn	OpenElect Voting Interface	UNI150037
OVI-7	Unisyn	OpenElect Voting Interface	UNI150049
OVI-VC	Unisyn	OVI-VC	UNI150012
OVI-VC	Unisyn	OVI-VC	UNI203030
OVI-VC	Unisyn	OVI-VC	UNI203050
OVI-VC	Unisyn	OVI-VC	UNI203066

Table 2-11 OVCS Equipment

Equipment	Make	Model	Serial Number
OVCS	Canon	ImageFORMULA DR-X10C	ED300631

Table 2-12 OCS Configurations

Equipment	Manufacturer / Model	Hardware Specifications	Service Tag	Software Configuration
PC 1	Dell Precision T3600	Processor: Intel Xeon E5-1620 3.6GHz Memory:4x 4GB 1600Mhz RAM Hard Drive Capacity: 500GB (Mirrored)	CP7GGX1	OVCS/ All OCS applications
PC 2	Dell Optiplex 7010	Processor: Intel Core i7-3770 3.4GHz Memory: 4x 4GB 1600Mhz RAM Hard Drive Capacity: 500GB	2Y7BGX1	All OCS applications
PC 3	HP 2000 Notebook PC	Processor: AMD Dual-Core E1-1500 1.48GHz Memory: 1x 4GB DDR3 SDRAM Hard Drive Capacity: 320GB	2c32NR	All OCS applications

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.5 Test Tools/Materials

Table 2-13 COTS OVS Accessory Equipment

COTS Equipment	Make	Model	Serial Number
Headphones	Koss	KPH5	T70987-HP-001
Headphones	Koss	KPH5	T70987-HP-002
Headphones	Koss	KPH5	HP-T58650-002
Sip & Puff	Origin Instruments	AirVoter	00594
UPS	Minuteman	Entrust Series ETR1500	AE580906PA106
UPS	Minuteman	Entrust Series ETR1500	AE580906PA114
UPS	Minuteman	Entrust Series ETR1500	AE58090500284
UPS	Minuteman	Entrust Series ETR1500	AE58090500278
20x Transport Media	STEC	USB Thumb Drive 1GB	TM001-TM0020
2x Thumb Drives	PNY	USB 16 GB	PNY1, PNY2
Network Switch	Linksys	SR2024 Business Series 24-Port 10/100/1000 Gigabit Switch	REM30H600558 GGR1807 JJ
ADA Voting Booth	American Made Election Equipment (AMEE)	Model 2000	T70987-VB01
Dot Matrix Printer	Oki	Microline 186	AK27043919B0
External DVD-RW Drive	Pioneer	DVR-X162Q	IDFW002121UC
External DVD-RW Drive	Samsung	SE-S084	R8816GAZA19986

Table 2-14 OCS Software Build Machines

Equipment and Operating System	Manufacturer	Version/Model	Serial Number	COTS /Non-COTS
Application Build Machine – CentOS Linux 6.3	Jetway	Processor: VIA Nano-BGA 1.5GHz Memory: 1GB Hard Drive Capacity: 320GB	T70987-SBM-001	COTS
OVI Linux OS Build Machine – CentOS Linux 6.3	Jetway	Processor: VIA Nano-BGA 1.5GHz Memory: 1GB Hard Drive Capacity: 320GB	T70987-SBM-003	COTS
Extra Hard Drives x 2	Western Digital	WD3200AAJA	N/A	COTS

Table 2-15 Test Support Materials

Test Material	Quantity	Description
50 CD-R Spindle	1	1x-52x 700mb
25 DVD-R Spindle	1	16x 2 hr
Box of Dot matrix printer paper	1	Printer paper
Box of OVI Paper Rolls	1	OVI Printer Paper
Box of OVO Paper Rolls	3	OVO Printer Paper
Security zip ties	1 bag	Numbered Security Ties
Security seals	1 bag	Numbered Security Seals

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.6 Vendor Technical Data Package

The Technical Data Package (TDP) contains information about requirements, design, configuration management, quality assurance, and system operations. The EAC 2005 VVSG requirements state, that at a minimum, the TDP shall contain the following documentation: system configuration overview; system functionality description; system hardware specifications; software design and specifications; system test and verification specifications; system security specifications; user/system operations procedures; system maintenance procedures; personnel deployment and training requirements; configuration management plan; quality assurance program; and system change notes.

Table 2-16 Unisyn OVS, Version 1.2 Voting System TDP

OVS Release 1.2 TDP Documents	Date	Document Version	Document Number
System Functionality Description	10/21/13	1.1	04-00444
Personnel Training and Deployment Requirements	09/09/13	1.0	04-00445
System Overview	10/24/13	1.5	04-00446
System Security Specification	10/24/13	1.1	04-00447
Configuration Management Plan	10/23/13	1.3	04-00448
System Test and Verification Plan	10/07/13	1.1	04-00453
Quality Assurance Plan	09/09/13	1.0	04-00454
System Hardware Specification	10/21/13	1.1	04-00458
System Maintenance Procedures	10/21/13	1.1	04-00459
System Operations Procedures: Warehouse Technician's Guide	10/21/13	1.2	04-00460
System Operations Procedures: Election Day Troubleshooter's Guide OVO and OVI	10/21/13	1.2	04-00462
System Operations Procedures: Election Day Pollworker's Guide OVO and OVI	10/21/13	1.4	04-00463
OVS Final Quality Assurance Report	06/20/13	1.0	04-00469
OVS Acronyms	10/24/13	1.2	04-00494
Software and Design Specification	07/08/13	1.7	04-00464
Election Manager User Guide	09/09/13	1.1	04-00427
Ballot Layout Manager User Guide	10/07/13	1.3	04-00428
Election Server User Guide	07/04/13	1.0	04-00429
Software Server User Guide	09/09/13	1.0	04-00430
Tabulator Client User Guide	04/21/13	1.0	04-00431
Tabulator User Guide	09/09/13	1.1	04-00432
Tabulator Reports User Guide	09/06/13	1.1	04-00433
OVCS User Guide	04/21/13	1.0	04-00495
Adjudicator User Guide	04/21/13	1.0	04-00530
OVS Paper Specification	07/16/13	1.0	04-00503
System HW Verification	10/22/13	1.1	04-00513

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.7 Deliverable Materials

The materials listed in Table 2-17 are identified by Unisyn Voting Solutions to be delivered as part of the Unisyn OVS, Version 1.2 Voting System to the end users.

Table 2-17 Unisyn OVS, Version 1.2 Voting System Deliverables

Deliverable Material	Version	Description
OCS	1.2	EMS software suite
OVO	1.2	Precinct ballot scanner
OVI-VC or OVI-7	1.2	Ballot Marking Device Early voting station Accessible voting station
Ballot Box - Plastic	1.1	OVO plastic ballot receptacle
Ballot Box – Portable	1.2	OVO portable ballot receptacle
Transport media	STEC 1 GB	USB Flash Drive X 2
Minuteman UPS	ETR1500	UPS X 2
Headphones (optional)	Koss KPH5	Stereo headphones
Sip and Puff (optional)	AirVoter	Binary input device
04-00444 OVS System Functionality	1.1	TDP Document
04-00446 System Overview	1.5	TDP Document
04-00459 System Maintenance Procedures	1.1	TDP Document
04-00454 Quality Assurance Plan	1.0	TDP Document
04-00494 OVS Acronyms	1.2	TDP Document
04-00428 Ballot Layout Manager User Guide	1.3	TDP Document
04-00427 Election Manager User Guide	1.1	TDP Document
04-00429 Election Server User Guide	1.0	TDP Document
04-00430 Software Server User Guide	1.0	TDP Document
04-00431 Tabulator Client User Guide	1.0	TDP Document
04-00432 Tabulator User Guide	1.1	TDP Document
04-00433 Tabulator Reports User Guide	1.1	TDP Document
04-00495 OVCS User Guide	1.0	TDP Document
04-00448 OVS Configuration Management Plan	1.3	TDP Document
04-00460 OVS System Operations Guide Warehouse Technician's Guide	1.2	TDP Document
04-00462 OVS System Operations Guide EDay Troubleshooters	1.2	TDP Document
04-00463 OVS System Operations Guide EDay Pollworkers	1.4	TDP Document
04-00464 Software Design and Specification	1.7	TDP Document
04-00503 OVS Paper Specification	1.0	TDP Document
04-00513 System HW Verification	1.1	TDP Document
04-00530 Adjudicator User Guide	1.0	TDP Document

3.0 TEST BACKGROUND

Wyle Laboratories 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. Wyle Laboratories holds the following accreditations:

- ISO-9001:2000
- ISO-9001:2008
- NVLAP Accredited ISO/ICE 17025:2005
- EAC Accredited VSTL, NIST 150,150-22
- A2LA Accredited (Certification No.'s 845.01, 845.02, and 845.03)

3.1 General Information

All testing performed as part of the test effort was performed at the Wyle Laboratories' Huntsville, AL, facility. Testing was limited to the Unisyn OVS, Version 1.2, which includes items listed in Section 2.0 of this report.

The strategy for evaluation of the Unisyn OVS, Version 1.2 was to review the change log, source code, and the engineering changes submitted for the modified system. Wyle Laboratories also evaluated test results from previous test campaigns performed by EAC accredited VSTL's as well as test cases and results of any developmental testing conducted by Unisyn during the pre-certification process that were provided by Unisyn in their TDP. The purpose of this evaluation was to determine the scope of testing required for system certification.

3.2 Testing Scope

To evaluate the system test requirements and the scope of the test campaign, each section of the EAC 2005 VVSG was analyzed to determine the applicable tests. The EAC 2005 VVSG Volume I Sections, along with the strategy for evaluation, are described below:

- Section 2: Functional Requirements – The requirements in this section were tested during the FCA and System Integration test utilizing the "Wyle Baseline Test Cases" along with test cases specially designed for the Unisyn OVS, Version 1.2.

- Section 3: Usability and Accessibility – The requirements in this section were tested during the Usability Test, FCA, and System Integration test utilizing a combination of the "Wyle Baseline Test Cases" and the "Wyle Baseline Usability Test Cases."

- Section 4: Hardware Requirements – The requirements in this section were tested by trained Wyle personnel per sections 4.4 of this report.

- Section 5: Software Requirements – The requirements in this section were tested during source code review, TDP review, and FCA. A combination of review and functional testing was performed to ensure these requirements were met.

- Section 6: Telecommunication – These requirements were not tested because no changes were included in this modification to the Standard Networking Configuration from the original Unisyn OVS, Version 1.0 EAC-certified system.

3.0 TEST BACKGROUND (Continued)

3.2 Testing Scope (Continued)

- Section 7: Security Requirements – The requirements in this section were tested during source code review, FCA, System Integration, and Security Tests.

- Section 8: Quality Assurance (QA) Requirements – The requirements in this section were tested throughout the test campaign via various methods. TDP review was performed on the Unisyn Voting Solutions QA documentation to determine compliance to EAC 2005 VVSG requirements and the requirements stated in the Unisyn Voting Solutions QA Program document. All source code was checked to ensure that Unisyn Voting Solutions followed their internal documentation process. All equipment received for initial testing and follow up testing was checked against Unisyn Voting Solutions documentation to ensure their QA process was being followed.

- Section 9: Configuration Management (CM) Requirements – The requirements in this section were tested throughout the test campaign. TDP review was performed on the Unisyn Voting Solutions configuration management documentation to determine EAC 2005 VVSG compliance and to further determine whether Unisyn Voting Solutions was following its documented CM requirements within the TDP. During source code review, Wyle Laboratories' qualified personnel verified that Unisyn was following EAC 2005 VVSG CM requirements as well as Unisyn CM requirements. All equipment received for initial testing and follow-up testing was checked against Unisyn's documentation to ensure their CM process was being followed.

The Unisyn OVS Version 1.2 Voting System is a paper-based precinct counting system; therefore, all EAC 2005 VVSG requirements pertaining to DRE's were excluded from this test campaign. Additionally, the following requirements were also excluded from the campaign:

- Volume I Section 6 (Telecommunication Requirements)
- Volume I Section 7.5.2-7.5.4 (Telecommunications and Data Transmission)
- Volume I Section 7.6 (Use of Public Communication Networks)
- Volume I Section 7.7 (Wireless Communications)
- Volume I Section 7.9 (Voter Verifiable Paper Audit Trail Requirements)

The rationale for not evaluating the Unisyn OVS, Version 1.2Voting System to the requirements contained in the indicated sections of the EAC 2005 VVSG is described in Table 3-1.

Table 3-1 Not Applicable Requirements

EAC 2005 VVSG Volume I Section	Rationale for 'Not Applicable'
6, 7.5.2-7.5.4	These requirements are written for use on public networks. The Unisyn OVS, Version 1.2 Voting System does not use public networks.
7.6	This section pertains to "Voting systems that transmit data over public telecommunications…" The Unisyn OVS, Version 1.2 as configured for this certification does not permit transmission over public networks.
7.7	No wireless technology is present in the Unisyn OVS, Version 1.2 Voting System.
7.9	The Unisyn OVS, Version 1.2 Voting System is a paper based system.

3.0 TEST BACKGROUND (Continued)

3.3 Wyle Quality Assurance

All work performed on this program was in accordance with Wyle Laboratories' Quality Assurance Program and Wyle Laboratories' Quality Program Manual, which conforms to the applicable portions of International Standard Organization (ISO) Guide 17025.

The Wyle Laboratories, Huntsville Facility, Quality Management System is registered in compliance with the ISO-9001 International Quality Standard. Registration has been completed by Quality Management Institute (QMI), a Division of Canadian Standards Association (CSA).

3.4 Test Equipment and Instrumentation

All instrumentation, measuring, and test equipment used in the performance of this test program was calibrated in accordance with Wyle Laboratories' Quality Assurance Program, which complies with the requirements of ANSI/NCSL 2540-1, ISO 10012-1, and ISO/IEC 17025. 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.

3.5 Terms and Abbreviations

Table 3-2 defines all terms and abbreviations applicable to this Test Report.

Table 3-2 Terms and Abbreviations

Term	Abbr.	Definition
Adjudicator	ADJ	Allows a jurisdiction to evaluate ballots with questionable markings and change them if need, in accordance with the perceived intent of the voter.
Americans with Disabilities Act of 1990	ADA	ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability.
Ballot Layout Manager	BLM	Unisyn OVS application used to layout ballot information.
Configuration Management	CM	---
Commercial Off the Shelf	COTS	Commercial, readily available hardware or software.
Direct Record Electronic	DRE	An electronic voting system that utilizes electronic components for the functions of ballot presentation, vote capture, vote recording, and tabulation which are logically and physically integrated into a single unit. A DRE produces a tabulation of the voting data stored in a removable memory component and in printed hardcopy.
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 Manager	EM	Utilizes the election definition file from the Ballot Layout Manager, adds jurisdiction voting device specific options and produces the CD used to load the election onto the voting devices and OVCS.
Election Management System	EMS	Within the OpenElect system, the EMS equivalent is OCS.
Election Server	ES	A component of the OCS, the ES updates the system clock and downloads new Election data to the voting devices prior to each election, typically at the warehouse.
Equipment Under Test	EUT	---
Functional Configuration Audit	FCA	Exhaustive verification of every system function and combination of functions cited in the manufacturer's documentation.

3.0 TEST BACKGROUND (Continued)

3.5 Terms and Abbreviations (Continued)

Table 3-2 Terms and Abbreviations (Continued)

Term	Abbr.	Definition
Help America Vote Act	HAVA	Act created by United States Congress in 2002.
International Lottery& Totalizator Systems, Inc	ILTS	The parent company of Unisyn Voting Solutions, Inc.
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.
OpenElect Central Suite	OCS	Set of applications supplied by Unisyn to run at the Election Headquarters to support elections on the OVO, OVI, and OVCS systems. Includes: Ballot Layout Manager, Election Manager, Election Server, Tabulator Client, Tabulator Server and Tabulator Reports. In addition, the OCS includes the Software Server (SS) system for updating and validating OVO and OVI (voting device) software. The Adjudicator application allows a Jurisdiction to review and change ballots based on perceived voter intent.
OpenElect Voting Central Scan	OVCS	A bulk scanner solution at the Central Site, used for casting provisional and mail-in ballots; can also be used to perform recounts.
OpenElect Voting Interface	OVI-7 OVI-VC	Used as a ballot marking device, ADA solution, and early voting device.
OpenElect Voting Optical Scan	OVO	Scanning and tabulating voting device located at the precinct and used during early voting.
OpenElect Voting System	OVS	The Unisyn voting system submitted for certification testing.
Personal Computer	PC	Computer component of the OpenElect Voting System
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. A witnessed build of the executable system is performed to ensure the certified release is built from tested components.
Quality Assurance	QA	---
Software Server	SS	Updates and validates voting device client software.
Specimen Under Test	SUT	---
Tabulator	TAB	The Tabulator receives and consolidates election results from the counted OVO and OVCS ballots that have been uploaded by the Tabulator Client (in the case of OVO results) and directly by the OVCS. The Tabulator stores the vote data in the database, provides a status for uploaded vote data and handles Rank Choice Voting functionality.
Tabulator Client	TC	Retrieves vote files from Transport Media devices and provides that data to the tabulator.
Technical Data Package	TDP	Manufacturer documentation related to the voting system required to be submitted as a precondition of certification testing.
Tabulator Reports	TR	Accesses data from the Tabulator database to generate the necessary unofficial and official reports.
Uninterruptible Power Supply	UPS	---
Voluntary Voting System Guidelines	EAC 2005 VVSG	Published by the EAC, the third iteration of national level voting system standards.
Wyle Operating Procedure	WoP	Wyle Test Method or Test Procedure

4.0 TEST FINDINGS AND RECOMMENDATIONS

4.1 Source Code Review

As part of the testing activities, the Unisyn OVS Version 1.2 Voting System received a 100% source code review to the EAC 2005 VVSG coding standards and the manufacturer supplied coding standards (Unisyn Software Design and Specification). Unisyn uses the "Code Conventions for the Java™ Programming Language Revised April 20, 1999" coding convention. The manufacturer-supplied coding standards can be found within the vendor provided TDP under Software Design and Specification. The review was conducted per the guideline described in this section.

As the source code was received, a SHA1 hash value was created for each source code file. The source code team then conducted automated source code reviews using Eclipse and Checkstyle because the source code is written entirely in JAVA. In addition to the automated source code review, Wyle also performed a 10% manual review of the headers and quality of comments. This was done to identify any violation of EAC 2005 VVSG coding standards or manufacturer-supplied coding standards. Each identified violation was recorded by making notes of the standards violation along with directory name, file name, and line number.

Summary Findings

No deficiencies or problems were found during the source code review.

4.2 Witnessed Build

A Witnessed Build of the software was created using Unisyn's trusted build documents. The "Trusted Builds" were performed by completing the following tasks in the order listed:

- Clear hard drive of existing data
- Retrieve the compliant source code
- Retrieve the installation media for OS, compilers, and build software
- Construct the build environment
- Create digital signatures of the pre-source build environment
- Create a disk image of the pre-source build environment
- Load the compliant source code into the build environment
- Create a digital signature of the post-source build environment
- Create a disk image of the post-source build environment
- Build the executable code
- Create the installation media
- Create a digital signature of the final build environment
- Create a disk image of the final build environment
- Create a digital signature of the installation media
- Install executable code onto the hardware and validate the software/firmware
- Deliver source code with digital signature, disk image of pre-build environment with digital signatures, disk image of post-build environment with digital signatures, executable code with digital signatures, and installation media to the EAC Repository.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.2 Witnessed Build (Continued)

The "Trusted Builds" for the Unisyn OVS Version 1.2 include source code, data, and script files, in clear text form. The builds also include COTS software on commercially available media, COTS software downloaded by the VSTL, COTS software verified by SHA1 from the software supplier, and picture and sound files in binary format provided by Unisyn Voting Solutions. The first step of the process was to clean the hard drives by writing data to every sector of the hard drive, so the drive is cleared of existing data. The designated operating system was then loaded and the applications from the VSTL-reviewed source along with the VSTL verified COTS software was built. The final step was installing the applications on the hardware.

Summary Findings

Wyle Laboratories performed Witnessed Builds for each system component of the Unisyn OVS Version 1.2 on October 17, 2013. A Technical Representative was present for each of the Witnessed Builds. The outputs from the Witness Builds have been supplied to the EAC as part of the certification effort.

4.3 Technical Data Package (TDP) Review

The Unisyn Voting Solutions, Inc., OpenElect Voting System Technical Data Package Version 1.2 was reviewed to the 2005 VVSG. This review was performed as part of the pre-testing activities.

The TDP contains information about requirements, design, configuration management, quality assurance, and system operations. The EAC requirements state that, at a minimum, the TDP shall contain the following documentation: system configuration overview; system functionality description; system hardware specifications; software design and specifications; system test and verification specifications; system security specifications; user/system operations procedures; system maintenance procedures; personnel deployment and training requirements; configuration management plan; quality assurance program; and system change notes.

The TDP documents were reviewed for accuracy, completeness, and compliance to the VVSG. The TDP documentation served as the basis for design and development of the functional tests. Functional testing also identified text in the TDP that conflicted with the actual operation of the system. These discrepancies were reported to Unisyn and tracked as test exceptions until verified that the applicable documents had been corrected.

Summary Findings

The review results were recorded in a worksheet that provided the pass/fail compliance to each applicable VVSG requirement. Unisyn corrected nonconformance observations and resubmitted the associated documents for review. This process continued until the TDP complied with TDP Standards.

A summary of the TDP issues encountered is provided below.

- Some descriptive information included was inconsistent with descriptions in other TDP documents.
- Some documents had inconsistent version numbers and revision history.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.3 Technical Data Package (TDP) Review (Continued)

- Some of the individual user guides included information which conflicted with the actual information encountered when verified during the testing process.

All noted TDP issues were resolved prior to the conclusion of the review process. Notice of Anomaly (NOA No. 16) documenting that TDP discrepancies were found is included in Appendix G of this report.

Summary Findings

The TDP review results were recorded in a worksheet and sent to Unisyn. Unisyn corrected all issues and resubmitted the associated documents for review. This process continued until the TDP accurately described the modifications to the system and complied with all TDP Standards.

4.4 Hardware Testing

The Unisyn OVS 1.2 is a paper-ballot based optical scan voting system. The OVS 1.2 system consists of five major components: the OCS (EMS), OVO precinct scanner, OVI-7, OVI-VC, and OVCS central count scanner. The OVS 1.2 is comprised of three proprietary pieces of hardware OVO, OVI-7 and OVI-VC, and one piece of COTS hardware (OVCS). All OCS functions are handled by proprietary software running on COTS PCs and laptops. Wyle Laboratories determined that these COTS PCs and laptops are not subject to hardware testing per the EAC 2005 VVSG. The provided PCs and laptops documented in Section 3 Materials Required For Testing all contained CE, UL, and FCC labeling.

OVI-VC – A PCA and quick scan was performed on the OVI-VC component to verify the changes and effects caused by the changes to the unit. Additional hardware testing as noted in table 4-1 was required based on the findings of the evaluation. Wyle Laboratories previously performed testing to the EAC 2005 VVSG during the approved certification testing for the OVI-VC (UNS10121966-OE-1.1). Wyle Laboratories utilized the data obtained during these test campaigns to satisfy additional requirements for this modification test campaign.

The OVO was retested for Accessibility and Security because of the addition of the portable ballot box.

The OVI-VC was retested for Electromagnetic Radiation, Electromagnetic Susceptibility, Electrostatic Disruption, Conducted RF Immunity, and Magnetic Fields Immunity because of the new motherboard and new touchscreen.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

Table 4-1 Hardware Test Examination Results

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Reuse Status	Test Date
Usability/3.1	Measure of the effectiveness, efficiency, and satisfaction achieved by a specified set of users	OVO/OVI-7/ OVI-VC	Accept	N/A
Accessibility/3.2	Tests the voting system to ensure accessibility for individuals with disabilities to include, but not limited to visually impaired voters by providing the same access and participation opportunity.	OVO/OVI-7/ OVI-VC	Accept for the OVI-7 & OVI-VC	10/18/13
Security/7	Tests the ability of the system to detect, prevent, log, and recover from a broad range of security risks identified.	OVO/OVI-7/ OVI-VC	Accept for the OVI-7 & OVI-VC	9/17/13
Maintainability/4.3.4	Tests the ease in which preventative and corrective maintenance actions can be performed based on design, software, and documentation.	OVO/OVI-7/ OVI-VC	Accept	N/A
Availability/4.3.5	Tests the voting system to help ensure the probability that the equipment will be operational and accomplish set functions. This shall be calculated using the following formula at a 99% availability rate: Ai=(MTBF)/(MTBF+MTTR)	OVO/OVI-7/ OVI-VC	Accept	N/A
Safety/4.3.8	UL 60950-1 product safety review	OVO/OVI-7/ OVI-VC	Accept	N/A
Electrical Supply/4.1.2.4	Meets voltage and power requirements of EAC 2005 VVSG Vol. 1 Section 4.1.2.4	OVO/OVI-7/ OVI-VC	Accept	N/A

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

Table 4-1 Hardware Test Examination Results (Continued)

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Reuse Status	Test Date
Electromagnetic Radiation /4.1.2.9	FCC Part 15 Class B for both radiated and conducted emissions	OVO/OVI-7/ OVI-VC	Accept for the OVO & OVI-7	8/20/13
Electromagnetic Susceptibility/4.1.2.10	IEC 61000-4-3 electromagnetic field of 10V/m modulated by a 1kHZ, 80% AM modulation at 80MHz to 1000MHz frequency	OVO/OVI-7/ OVI-VC	Accept for the OVO & OVI-7	9/3/13
Temperature/Power Variation/4.1.2.13	MIL-STD-810D, Method 502.2 and Method 501.2 163 hours at 50 degrees to 95 degrees	OVO/OVI-7/ OVI-VC	Accept	N/A
High Temperature/4.1.2.14	MIL-STD-810D, Method 501.2 maximum temperature shall be 140 degrees F	OVO/OVI-7/ OVI-VC	Accept	N/A
Low Temperature/4.1.2.14	MIL-STD-810D minimum temperature shall be -4 degrees F	OVO/OVI-7/ OVI-VC	Accept	N/A
Bench Handling	MIL-STD-810D, Method 516.3 Procedure VI six 4" drops on each edge totaling 24 drops	OVO/OVI-7/ OVI-VC	Accept	N/A
Vibration/4.1.2.14	MIL-STD-810D, Method 514.3 physical shock and vibration during handling and transport	OVO/OVI-7/ OVI-VC	Accept	N/A
Humidity Test/4.1.2.14	MIL-STD-810D, Method 501.2 ten 24 hour humidity cycles	OVO/OVI-7/ OVI-VC	Accept	N/A
Electrical Power Disturbance/4.1.2.5	IEC 61000-4-11 (1994-06) power surges and dips	OVO/OVI-7/ OVI-VC	Accept	N/A
Electrical Fast Transient/4.1.2.6	IEC 61000-4-4 (1995-01)	OVO/OVI-7/ OVI-VC	Accept	N/A
Lightning Surge/4.1.2.7	IEC 61000-4-5 (1995-02)	OVO/OVI-7/ OVI-VC	Accept	N/A
Electrostatic Disruption/4.1.2.8	IEC 61000-4-2 (1995-01) 15kV air discharge and 8kV contact discharge	OVO/OVI-7/ OVI-VC	Accept for the OVO & OVI-7	9/6/13
Conducted RF Immunity/4.1.2.11	IEC 61000-4-6 (1996-04) conducted radio frequency energy	OVO/OVI-7/ OVI-VC	Accept for the OVO & OVI-7	9/6/13
Magnetic Fields Immunity/4.1.2.12	IEC 61000-4-8 (1993-06) AC magnetic fields of 30 A/m at 60Hz	OVO/OVI-7/ OVI-VC	Accept for the OVO & OVI-7	8/20/13

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

4.4.1 Electromagnetic Radiation Test (FCC Part 15 Emissions)

Electromagnetic Radiation emissions measurements were performed in accordance with Section 4.8 of Volume II of the VVSG. This testing was performed to ensure that emissions emanating from the OVI-VC do not exceed the limits of FCC Part 15, Class B emissions. The OVI-VC was configured to run in an automated audio test mode, where continual audio processing would occur during the testing.

The OVI-VC successfully met the requirements of the Electromagnetic Emissions Test. The Test Data Sheet is in Appendix B; the Instrumentation Equipment Sheet is in Appendix C; photographs are in Appendix D of this report.

4.4.2 Conducted RF Immunity

Conducted RF Immunity testing was performed in accordance with Sections 4.1.2.11 (a) of Volume I and 4.8 of Volume II of the 2005 VVSG. Section 4.1.2.11 (b) of Volume I is not applicable because there are no signal/control lines greater than three meters. This testing was performed to ensure that the OVI-VC was able to withstand conducted RF energy onto its power lines without disruption of normal operation or loss of data.

The OVI-VC was configured to run in an automated audio test mode, where continual audio processing would occur during the testing without operator intervention. The EUT was then subjected to conducted RF energy of 10 V rms applied to its power lines over a frequency range of 150 kHz to 80 MHz.

The OVI-VC successfully met the requirements of the Conducted RF Immunity Test. The Test Data Sheet is in Appendix B; the Instrumentation Equipment Sheet is in Appendix C; photographs are in Appendix D of this report.

4.4.3 Electrostatic Disruption Test

Electrostatic Disruption testing was performed in accordance with sections 4.1.2.8 of Volume I and 4.8 of Volume II of the VVSG to ensure that should an electrostatic discharge event occur during equipment setup and/or ballot counting, that the OVI-VC would continue to operate normally. A momentary interruption is allowed so long as normal operation is resumed without human intervention or loss of data.

The OVI-VC was configured to run in an automated audio test mode, where continual audio processing would occur during the testing without operator intervention. The OVI-VC was then subjected to electrostatic discharges of +/- 8 kV contact and +/- 15 kV air. Discharges were performed at areas typical of those which might be touched during normal operation, including the touch screen, user buttons, and other likely points of contact.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

4.4.3 Electrostatic Disruption Test (Continued)

Table 4-2 Electrostatic Discharge Test Levels

Requirements			
Characteristic	**Capacitance**	**Resistance**	**Value**
Pulse Wave Shape (RC Network)	150 pf	330 Ω	pf / Ω
Test Levels	**Discharge Types**		**Value**
	Air	**Indirect**	
	±15	±8	kV
Rise Time	≤1		nanosecond
Pulse Decay Time	≈30 at 50% height		nanosecond
Pulse Repetition	≥1		per second
Total Injected Pulse at each Test Point	10		per polarity (±)
Temperature	≥15 to ≤35		°C
Relative Humidity	≥30 to ≤60		%

During the Electrostatic Disruption Test, there was one anomaly recorded. Refer to Notices of Anomaly (NOA) No. 8 presented in Appendix G and Section 4.6 of this test report for further details. After resolution of the anomaly, the OVI-VC successfully met the requirements of the Electrostatic Disruption Test. The Test Data Sheet is in Appendix B; the Instrumentation Equipment Sheet is in Appendix C; photographs are in Appendix D of this report.

4.4.4 Electromagnetic Susceptibility Test

Electromagnetic Susceptibility testing was performed in accordance with Sections 4.1.2.10 of Volume I and 4.8 of Volume II of the 2005 VVSG. This testing was performed to ensure that the OVI-VC was able to withstand a moderate level of ambient electromagnetic fields without disruption of normal operation or loss of data.

The OVI-VC was configured to run in an automated audio test mode, where continual audio processing would occur during the testing without operator intervention. The EUT was then subjected to ambient electromagnetic fields at 10 V/m over a range of 80 MHz to 1000 MHz.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

4.4.4 Electromagnetic Susceptibility Test (Continued)

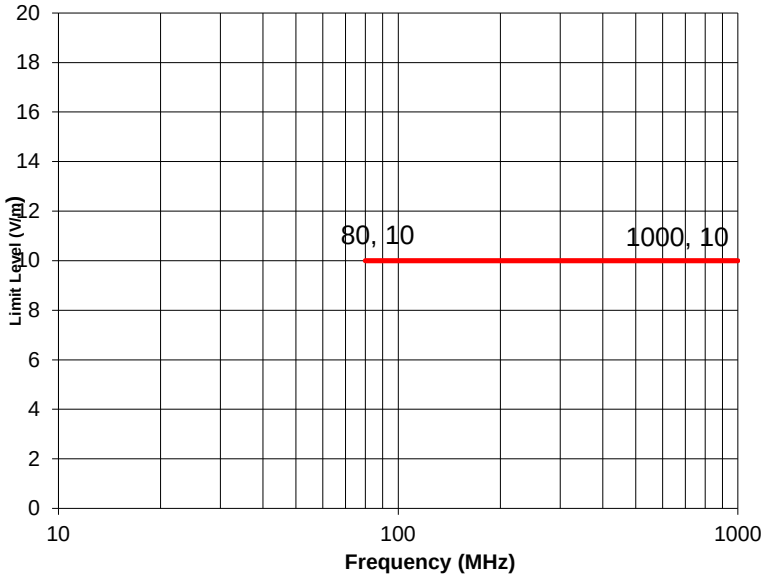

Figure 4-1 Radiated Susceptibility Limit

During the Electromagnetic Susceptibility Test, there was one anomaly recorded. Refer to Notice of Anomaly (NOA) No. 5 presented in Appendix G and Section 4.6 for further details. After resolution of the anomaly, the OVI-VC successfully met the requirements of the Electromagnetic Susceptibility Test. The Test Data Sheet is in Appendix B; the Instrumentation Equipment Sheet is in Appendix C; photographs are in Appendix D of this report.

4.4.5 Magnetic Fields Immunity

Magnetic Fields Immunity testing was performed in accordance with Section 4.1.2.12 of Volume I of the EAC 2005 VVSG. This testing was performed to ensure that the OVI-VC is immune to AC magnetic fields of 30A/m at 60 Hz. The OVI-VC was configured to run in an automated audio test mode, where continual audio processing would occur during the testing without operator intervention.

The OVI-VC successfully met the requirements of the Magnetic Fields Immunity. The Test Data Sheet is in Appendix B; the Instrumentation Equipment Sheet is in Appendix C; photographs are in Appendix D of this report.

4.4.6 Acoustic Sound Level Test

The OVI-VC was subjected to an Acoustic Noise Level Test to satisfy the following requirements of Section 3.2.2.2 (c) (v, vi, and vii) of Volume I of the 2005 VVSG. The OVI-VC was configured to run in an automated audio test mode, where continual audio processing would occur during the testing without operator intervention.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Hardware Testing (Continued)

4.4.6 Acoustic Sound Level Test (Continued)

During the Acoustic Noise Level Test, there were two anomalies recorded. Refer to Notices of Anomaly (NOA) Nos. 9 and 12 presented in Appendix G and Section 4.6 for further details. After resolution of the anomalies, the OVI-VC successfully met the requirements of the Acoustic Noise Level Test. The Instrumentation Equipment Sheet is in Appendix C; photographs are in Appendix D of this report.

4.5 System Level Testing

System Level Testing was performed to evaluate the integrated operation of the voting system hardware and software. The suite of tests that comprise the System level Testing includes: System Integration Test, Security Test, Usability and Accessibility Tests, Data Accuracy, as well as the Physical and Functional Configuration Audits.

4.5.1 System Integration Test

An overview of the suite of tests performed during System Level Testing is provided in the following paragraphs, along with the summary findings of each test.

System Integration Testing was performed to test all system hardware, software, and peripherals. System Integration Testing focused on the complete system including all proprietary software, proprietary hardware, proprietary peripherals, COTS software, COTS hardware, and COTS peripherals configured as a precinct count unit as described in the Unisyn-submitted TDP for the OVS, Version 1.2. To perform the System Integration Testing, Wyle Laboratories developed specific procedures and test cases designed to test the system as a whole. These procedures demonstrated compliance of the OVS, Version 1.2, to Sections 2, 3, 4, 5, and 6 of Volume I of the VVSG.

The six election definitions exercised during the System Integration Testing are listed below:

- GEN-01
- GEN-02
- GEN-03
- PRIM-01
- PRIM-02
- PRIM-03

Summary Findings

During the System Integration Test, there was one anomaly recorded. Refer to Notice of Anomaly (NOA) No. 15 presented in Appendix G and Section 4.6 for further details. After resolution of the anomaly, voting system successfully met the requirements of the System Integration Test. Through System Integration Testing, it was demonstrated that the system performed as documented with all components performing their intended functions. The photographs of the test set up are in Appendix D of this report.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5 System Level Testing (Continued)

4.5.2 Security

The Unisyn OVS 1.2 was subjected to Security Testing in accordance with the requirements of Section 7.0 of Volume I and Section 6.4 of Volume II of the VVSG. The purpose of the Security Test was to verify the tamper evident security ties and seals of the newly introduced OVO Portable Ballot Box meet the requirements of the VVSG, and to confirm the ballot storage device is secure. All other previously certified components of the Unisyn OVS 1.2 system were unmodified and therefore accepted for the current test campaign.

The Security Test was performed to provide verification of the access controls and the physical controls for the OVO Portable Ballot Box documented by Unisyn.

Summary Findings

The security tie straps/tamper evident seals and their documented installation were analyzed and found to be adequate. Wyle has determined the Unisyn OVS 1.2 OVO Portable Ballot Box to be compliant with the security requirements of the EAC 2005 VVSG.

4.5.3 Usability and Accessibility

The Unisyn OVS 1.2 Voting System was subjected to Usability and Accessibility Tests in accordance with Volume I, Section 3 of the EAC 2005 VVSG. The purpose of this testing was to assess the newly introduced OVO Portable Ballot Box conformance to the usability and accessibility requirements in the EAC 2005 VVSG. Conformance to these requirements should result in quality interaction between the voter and the voting system and the effectiveness with which the system provides a comfortable and efficient voting session that provides confidence to the voter that their votes are cast correctly.

The Usability and Accessibility requirements set forth by the VVSG and the Help America Vote Act (HAVA) ensure that all eligible voters are provided the ability to vote without discrimination regardless of any disabilities. As stated in the VVSG, to meet the requirements of the Usability and Accessibility Test, the voting system shall: conform to the specified usability requirements of Volume I, Section 3.1; provide the capabilities required by Volume I, Section 3.2; and, operate consistently with vendor specifications and documentation.

The requirements identified for this campaign were EAC 2005 VVSG Vol. I, Section 3.2.4a and b. The newly introduced OVO Portable Ballot Box was tested to ensure the applicable mobility requirements were met.

Summary Findings

During test performance, no issues with the OVO Portable Ballot Box were observed.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5 System Level Testing (Continued)

4.5.4 Data Accuracy Test

The OVS version 1.2 Voting System was subjected to a Data Accuracy Test in accordance with the requirements of Section 4.7.1.1 of Volume II of the VVSG.

Per the VVSG, data accuracy is defined in terms of ballot position error rate. This rate applies to the voting functions and supporting equipment that capture, record, store, consolidate, and report the selections (or absence thereof) made by the voter for each ballot position. To meet the requirements of this test, the voting system must be subjected to the casting of a large number of ballots to verify vote recording accuracy, i.e. at least 1,549,703 ballot positions correctly read and recorded.

Summary Findings

OVO - For the data accuracy test, three OVOs were set up to cast 1,592,100 ballot positions via multiple ballots styles that are supported by the system. During the Accuracy test, there were four anomalies recorded. Refer to Notices of Anomaly (NOA) Nos. 10, 11, 13, and 14 presented in Appendix G and Section 4.6 for further details. After resolution of these anomalies, the OVO cast and recorded 1,592,100 ballot positions correctly.

Table 4-3 Unisyn OVS 1.2 Accuracy OVO

Ballot Size	No. of Ballots	No. of Machine Marked	No. of Hand Marked	No. Ballot Positions per Ballot	No. of Machines in Test	No. of Times Voted	Total Ballot Positions
11 inch	100	30	70	219	3	5	328,500
14 inch	100	30	70	291	3	4	349,200
17 inch	100	30	70	357	3	4	428,400
19 inch	100	30	70	405	3	4	486,000
Total	**400**	**120**	**280**	**N/A**	**N/A**	**17**	**1,592,100**

In addition to the accuracy test, Wyle performed a reliability test using the accuracy ballots. Wyle successfully scanned 1,100 ballots of each supported ballot size in each orientation (four orientations) using one OVO for each supported ballots size. The total number of ballots scanned was 17,600.

Table 4-4 Unisyn OVS 1.2 Additional Accuracy OVO

Ballot size	No. of Ballots	No. Ballot Positions per Ballot	No. of Machines in Test	No. of Times Voted	Total Ballot Positions	Total Ballots	Oval Position
11 inch	4400	219	1	1	963600	4400	L
14 inch	4400	291	1	1	1280400	4400	L
17 inch	4400	357	1	1	1570800	4400	R
19 inch	4400	405	1	1	1782000	4400	R
Total	**17600**	**N/A**	**N/A**	**4**	**5,596,800**	**17,600**	

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5 System Level Testing (Continued)

4.5.4 Data Accuracy Test (Continued)

OVI - For the data accuracy test, two OVI-7s and three OVI-VCs were set up to print 1,555,575 ballot positions via multiple ballots styles that are supported by the system. The OVI-7s and OVI-VCs correctly printed 1,555,575 ballot positions. The printed ballots were successfully scanned into the OVCS.

Table 4-5 Unisyn OVS 1.2 Accuracy OVI-7/OVI-VC

Ballot Size	No. of Ballots	No. Ballot Positions per Ballot	No. of Machines in Test	No. Of Times Printed	Total Ballot Positions	Total Ballots Printed
11 inch	240	219	5	1	262,800	1200
14 inch	240	291	5	1	349,200	1200
17 inch	245	357	5	1	437,325	1225
19 inch	250	405	5	1	506,250	1250
Total	**975**	**N/A**	**N/A**	**4**	**1,555,575**	**4875**

OVCS - For the data accuracy test, one OVCS was set up to cast 1,592,100 ballot positions via multiple ballots styles that are supported by the system. The OVO cast and recorded 1,592,100 ballot positions accurately.

Table 4-6 Unisyn OVS 1.2 Accuracy OVCS

Ballot Size	No. of Ballots	No. of Machine Marked	No. of Hand Marked	No. Ballot Positions per Ballot	No. of Machines in Test	No. of Times Voted	Total Ballot Positions
11 inch	300	90	210	219	1	5	328,500
14 inch	300	90	210	291	1	4	349,200
17 inch	300	90	210	357	1	4	428,400
19 inch	300	90	210	405	1	4	486,000
Total	**1200**	**120**	**280**	**N/A**	**N/A**	**17**	**1,592,100**

4.5.5 Physical Configuration Audit

A Physical Configuration Audit (PCA) of the Unisyn OVS 1.2 Voting System was performed in accordance with Section 6.6 of Volume II of the VVSG. The PCA compares the voting system components submitted for certification with the vendor's technical documentation and confirms that the documentation submitted meets the requirements of the Guidelines. The PCA included the following activities:

- Establishing 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,
- Verifying 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,
- Reviewing drawings, specifications, technical data, and test data associated with system hardware, and to establish system baseline,
- Reviewing 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,

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5 System Level Testing (Continued)

4.5.5 Physical Configuration Audit (Continued)

- 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

The PCA performed on the Unisyn OVS 1.2 Voting System consisted of inspecting the following:

- The OpenElect Central Suite (OCS) software
- The OpenElect Voting Optical Scan unit (OVO)Precinct Count Optical Scanner
- The OpenElect Voting Interface (OVI-7, OVI-VC), Ballot Marking, ADA, and Early Voting Device
- The OpenElect Voting Central Scan (OVCS) Optical Central Count High Speed Scanner
- All accessories, equipment and documentation used with the Unisyn OVS 1.2 Voting System

Summary Findings

A focused PCA was performed to baseline the system's hardware and software components that were used during the test campaign. No discrepancies were noted during the PCA.

4.5.6 Functional Configuration Audit

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 for the TDP. In addition to functioning according to the manufacturer's documentation, tests were conducted to ensure all applicable EAC 2005 VVSG requirements are met.

A Functional Configuration Audit (FCA) of the Unisyn OVS 1.2 was performed in accordance with Section 6.7 of Volume II of the VVSG. The purpose of the FCA was to verify that the Unisyn OVS 1.2 performs as documented in the Unisyn-supplied technical documentation during pre-voting, voting, and post-voting activities and validate that the Unisyn OVS 1.2 meets the requirements of the EAC 2005 VVSG. To perform the FCA, the Unisyn OVS 1.2 was subjected to a series of tests to simulate pre-voting, voting, and post-voting activities. These tests were performed to ensure compatibility of voting machine functions at the precinct level using the referenced firmware. During the FCA, both normal and abnormal data was input into the system to attempt to introduce errors and test for error recovery. The activities simulated were:

- Verification of hardware status via diagnostic reports prior to election
- Performing procedures required to prepare hardware for election operations
- Obtaining 'zero' machine report printouts on all contest fields
- Performing procedures to open the polling place and enable ballot counting
- Casting of ballots to demonstrate proper processing, error handling, and generation of audit data
- Performing hardware operations required to disable ballot counting and closing the polls
- Obtaining machine reports and verifying correctness
- Obtaining machine-generated audit logs and verifying correctness

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5 System Level Testing (Continued)

4.5.6 Functional Configuration Audit (Continued)

The FCA was divided into three phases: pre-voting, voting, and post-voting. The three phases are described in greater detail in steps (1) through (3).

1. Pre-Voting

   Pre-Voting encompasses all activities performed to the point of loading the election data on a transport media. These activities include verifying roles, user administration, database administration, defining the political subdivisions, defining election types, defining voting variations, defining the ballot contents, audio ballot definition, election definition loading, auditing election creation process, producing pre- election reports, adding to existing elections, updating existing elections, modifying ballot styles, verifying alternative language translations, and loading an election on precinct count devices.

2. Voting

   Voting encompasses all activities performed by poll workers, voters, and warehouse maintenance technicians after an election has been loaded, through the processing of special votes such as absentee and provisional ballots.

   These activities include pre-election logic testing, diagnostic tests, opening the polls, activating ballots, voting and casting both normal and audio ballots, utilizing the usability and accessibility aspects of the accessible voting station, closing the polls, printing machine reports, performing post-election maintenance tasks, and executing special voting sessions such as the processing of absentee and provisional ballots.

3. Post-Voting

   Post-Voting encompasses all activities performed from verification of machine reports to the EMS post-election activities. These activities include verifying election results, tabulation of results, consolidating voted data, Transport Media (TM) maintenance & cleaning, Transport Media logs, concluding an election, backing up results, deleting elections, and auditing voting machine log.

Summary Findings

A Functional Configuration Audit was performed to ensure the system functions and operates as described within the system's technical documentation. Notice of Anomaly (NOA) No. 17 found in Appendix G was created to cover all issues notated during the FCA. Further detail is located within Appendix F (FCA Issues Report) of this report. A total of 22 issues were identified and corrected prior to the conclusion of the test campaign.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5 System Level Testing (Continued)

4.5.7 Availability

The voting system achieved at least 99 percent availability during normal operation for the applicable functions of the system.

4.6 Anomalies and Resolutions

A total of seventeen Notices of Anomaly were issued throughout the test campaign upon occurrence of a verified failure, an unexpected test result, or any significant unsatisfactory condition. All anomalies encountered during testing were successfully resolved prior to test completion. The Notices of Anomaly generated during testing are presented in their entirety in Appendix F and are summarized below along with their resolution.

Notice of Anomaly No. 1: OVO Quick Scan.
A quick scan discovered that the OVO did not meet the emissions levels for this requirement.

Resolution to Anomaly No. 1:
Unisyn made the determination to remove the new hardware (motherboard and touchscreen) from testing and revert back to the previously certified OVS 1.1 hardware.

Notice of Anomaly No. 2: OVI-VC Quick Scan.
A quick scan discovered that the OVI-VC did not meet the emissions levels for this requirement.

Resolution to Anomaly No. 2:
Unisyn Engineering department determined that the cause of the problem was that the Ethernet cable was improperly routed, the cable was too close to the power supplies. The cable was re-routed per ILTS Assembly drawing 8033-93003 which shows that the Ethernet cable should be routed along the inside of the chassis sides. Upon re-routing of the Ethernet cable the OVI-VC passed FCC Part 15 Class B Radiated Emissions testing.

Notice of Anomaly No. 3: OVO Electromagnetic Susceptibility
This test was conducted using an auto-feed or "shoeshine" mode. During the test, the unit failed to continuously scan the ballot in the shoeshine mode. The ballot was left in the paper path and had to be removed manually. The unit did not lose power, and the unit did not lose any data. Once the ballot was removed, the unit operated normally. Wyle was able to replicate this anomaly.

Resolution to Anomaly No. 3:
Unisyn made the determination to remove the new hardware (motherboard and touchscreen) from testing and revert back to the previously certified OVS 1.1 hardware.

Notice of Anomaly No. 4: OVI-VC Electromagnetic Susceptibility
The test was conducted with the unit in audio mode. During Post operational status check, 5 ballots were printed by the OVI-VC to be cast into the OVO. The OVO would not read the first ballot due to ambiguous print at the top of the first ballot.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 Anomalies and Resolutions (Continued)

Resolution to Anomaly No. 4:
Unisyn Engineering department determined that the cause of the problem was that the Printer serial printer cable was touching the key lock on the front of the OVI-VC and thus susceptible to interference. In addition, it was determined that improving the grounding of the printer could help alleviate the issue.

A tie wrap was placed over the cable DB9 connector and cable to keep the cable tight against the connector to insure there is a gap between the printer data cable and the lock. In addition, the paint on the OVI-VC chassis around the printer grounding-screw hole was removed to improve connection of the printer ground screw under the OVI-VC. The EUT was retested and successfully passed the test.

Notice of Anomaly No. 5: OVI-7 in Electrostatic Discharge
The test was conducted with the unit in audio mode. The printer advanced paper and printed ambiguous print at the top of the ballot. Theses ballots could not be read into the OVO. This occurred two times on +8kv contact on the keyhole.

Resolution to Anomaly No. 5:
Unisyn Engineering department determined that the cause of the problem was that the Printer serial printer cable was touching the key lock on the front of the OVI-7 and thus susceptible to static. In addition, it was determined that improving the grounding of the printer could help alleviate the issue.

A tie wrap was placed over the cable DB9 connector and cable to keep the cable tight against the connector to insure there is a gap between the printer data cable and the lock. In addition, the paint on the OVI-7 chassis around the printer grounding-screw hole was removed to improve connection of the printer ground screw under the OVI-7. The EUT was retested and successfully passed the test.

Notice of Anomaly No. 6: OVO Electromagnetic Susceptibility second attempt
A USB cable to the scanner was replaced with another cable. However, this modification did not resolve the issue. This test was conducted using an auto-feed or "shoeshine" mode. During the test, the unit failed to continuously scan the ballot in the shoeshine mode. The ballot was left in the paper path and had to be removed manually. The unit did not lose power, and the unit did not lose any data. Once the ballot was removed, the unit operated normally.

Resolution to Anomaly No. 6:
Unisyn made the determination to remove the new hardware (motherboard and touchscreen) from testing and revert back to the previously certified OVS 1.1 hardware

Notice of Anomaly No. 7: OVO Electromagnetic Susceptibility third attempt
An application firmware update was performed on the unit. However, this modification did not resolve the issue. This test was conducted using an auto-feed or "shoeshine" mode. During the test, the unit failed to continuously scan the ballot in the shoeshine mode. The ballot was left in the paper path and had to be removed manually. The unit would not respond and had to be powered off. The unit did not lose any data. Once the unit was powered cycled, it operated normally.

Resolution to Anomaly No. 7:
Unisyn made the determination to remove the new hardware (motherboard and touchscreen) from testing and revert back to the previously certified OVS 1.1 hardware.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 Anomalies and Resolutions (Continued)

Notice of Anomaly No. 8: OVI-VC Electrostatic Discharge
The test was conducted with the unit in audio mode. The printer advanced the paper and printed ambiguous print at the top of the ballot. These ballots could not be read into the OVO. The anomaly occurred on -8kv contact on the metal monitor bracket on the side of the unit.

Resolution to Anomaly No. 8:
Unisyn Engineering department determined that the cause of the problem was insufficient path for the ESD to dissipate to ground. A ground wire, ILTS PN 6053-10660, dual ring grounding cable assembly was installed to provide the proper path. The ground wire is routed from a nut on the OVI-VC frame to the nut on the top cover. The nut on the top cover is attached to a stud that attached to the OVI-VC display mount. The EUT was retested and successfully passed the test.

Notice of Anomaly No. 9: OVI-VC Acoustic Noise Level and Hearing Aid Compatibility
Wyle engineers performed the Acoustic Noise Level Test and Hearing Aid Compatibility on the OVI-VC. The OVI-VC failed to achieve the required maximum volume of 100 dB SPL. The maximum volume produced was 66 dB SPL.

Resolution to Anomaly No. 9:
Unisyn determined that the sound file amplitude was not high enough. They provided a sound utility which allowed the production of sound files with greater initial volume. This anomaly was resolved but the retest failed because of NOA 12.

Notice of Anomaly No. 10: OVO Accuracy
The system failed to read 1,549,703 consecutive ballot positions correctly. 11 inch ballots were scanned through the OVO and the results did not match the expected results.

Resolution to Anomaly No. 10:
Unisyn determined that the minimum mark values were too small, definition called for 20% fill or 1mm line across length of ballot. Marking areas on ballots are 11 x 13 pixels at 72 dpi or 143 total pixels. 20% of that is 29 pixels, but marks are 4 x 4 pixels or 16, far below 20% value. Unisyn increased the size of the machine made minimum marks to be a 1mm line. The Unisyn minimum mark definition in the Conformance Statement was updated to correspond to this change. This anomaly was resolved but the retest failed because of NOA No. 11.

Notice of Anomaly No. 11: OVO Accuracy second attempt
The system failed to read 1,549,703 consecutive ballot positions correctly. 14 inch ballots were scanned on UNI000040 and 11 inch ballots were scanned on UNI000044 and the results did not match the expected results.

Resolution to Anomaly No. 11:
Unisyn determined that the issue was caused by the edge cleanup process splitting one timing mark and erasing another so that even though marks were not where expected, the number of marks passed validation causing a valid ballot, but misreading marks. Unisyn changed the definition of minimum timing mark to be 50% + 1 pixel of full size mark. This anomaly was resolved but the retest failed because of NOA No. 13.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 Anomalies and Resolutions (Continued)

Notice of Anomaly No. 12: OVI-VC Acoustic Noise Level and Hearing Aid Compatibility - Second attempt
Wyle engineers performed the Acoustic Noise Level Test and Hearing Aid Compatibility on the OVI-VC. The OVI-VC failed to achieve the required maximum volume of 100 dB SPL. The maximum volume produced was 79 dB SPL.

Resolution to Anomaly No. 12:
Unisyn determined that the Master sound volume setting in Linux OS was not high enough. They added a change to increase the master sound volume to max level, which allowed for greater total output on headphone channel. The EUT was retested and successfully passed the test.

Notice of Anomaly No. 13: OVO Accuracy- Third Attempt
The system failed to read 1,549,703 consecutive ballot positions correctly. 14 inch ballots were scanned in UNI000044 and the results did not match the expected results.

Resolution to Anomaly No. 13:
Unisyn determined that the issue was specific to left hand target ballots. Right hand target ballot design contained column header IDs that provided additional detection if a ballot image was not readable. Ballot design for left hand targets was updated to include column header IDs. Column header IDs were shrunk on all ballots type to approach minimum mark size as added validation. This anomaly was resolved but the retest failed because of NOA No. 14.

Notice of Anomaly No. 14: OVO Accuracy- Fourth Attempt
The system failed to read 1,549,703 consecutive ballot positions correctly. OVO test unit UNI000041 failed to read the 11 inch ballots consistently. The 11 inch ballots were rejected as invalid.

Resolution to Anomaly No. 14:
Unisyn determined that the top and bottom column ID marks were printed thinner so that they were closer to minimum mark value. However, threshold for that area was set at 50%, and thickness of column ID mark was just less than 50% of timing mark height. The ballot definition configuration file was adjusted so that column ID area is looking for a 40% threshold. The EUT was retested and successfully passed the test.

Notice of Anomaly No. 15: OVO System Integration
During the System integration test, the ballots that were printed by the OVI for the Gen-01 election could not be read by the OVO.

Resolution to Anomaly No. 15:
Unisyn determined that the 14” inch OVI ballot length defined for printing on OVI was at the lower end of the valid length for a ballot. The printed length must be within ¼ inch of target length. The defined length of 14” ballots, as printed by the OVI, was increased to be more towards the midrange of valid length. The EUT was retested and successfully passed the test.

Notice of Anomaly No. 16: TDP Review
Review of the summited documentation revealed discrepancies between the TDP and the EAC 2005 VVSG requirements. Functional testing also identified text in the TDP that conflicted with the actual operations of the system. Each noted discrepancy was documented in detail in the Wyle generated TDP issues matrix that is on file as raw data.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 Anomalies and Resolutions (Continued)

Resolution to Anomaly No. 16:
Open Elect 1.2 is a Modification of a previously certified system. As such the TDP was only reviewed where modified or where impacted by system modification. Unisyn corrected each nonconformance observation and resubmitted the associated documents for review. This process continued until it appeared that the TDP complied with all applicable requirements.

Notice of Anomaly No. 17: Functional Configuration Audit
During performance of the FCA, issues were noted related to system functionality.

Resolution to Anomaly No. 17:
A report of all identified issues was sent to Unisyn for resolution. Unisyn then corrected all noted issues and the tests were repeated with no anomalies.

4.7 Recommendation for Certification

Wyle concludes that the Unisyn OVS 1.2, submitted by Unisyn Voting Solutions Inc., meets all applicable requirements for certification as set forth in the Election Assistance Commission (EAC) 2005 Voluntary Voting Systems Guidelines, Version 1.0, as well as passes all additional tests performed at Wyle Laboratories' discretion. As such, Wyle Laboratories recommends that the EAC grant the Unisyn Voting Solutions OVS 1.2, certification to the VVSG.

This report is valid only for the system identified in Section 2.0 of this report. Any changes, revisions, or corrections made to the system after this evaluation shall be submitted to the EAC to determine if the modified system requires a new application, or can be submitted as a modified system. The scope of testing required will be determined based upon the degree of modification.

Due to the varying requirements of individual jurisdictions, it is recommended by the EAC 2005 VVSG that local jurisdictions perform pre-election logic and accuracy tests on all systems prior to their use in an election within their jurisdiction.

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APPENDIX A

SYSTEM MODIFICATIONS

Module Affected	Version	Description
Adjudicator	1.2	Adjudicate Straight ticket contests - Allow straight ticket contests to be adjudicated and to populate (adjust) other contests per straight ticket rules. Each change recorded as separate transaction, noted as straight ticket.
Adjudicator	1.2	Make entire candidate name selectable, not just the radio button.
All Modules	1.2	Allow jurisdiction to set vote for text for a single contest
All Modules	1.2	No Candidate Filed' handling on screen and in reports. The 'write-in' candidate
All Modules	1.2	Remove Decline to State option
All Modules	1.2	Same precinct may have different ballot style ids for different parties in a primary.
Ballot Layout Manager	1.2	Add custom graphics and text to an election ballot.
Ballot Layout Manager	1.2	Create custom headers for ballots in various sizes.
Ballot Layout Manager	1.2	Export precinct district associations to csv file
Ballot Layout Manager	1.2	Import district/precinct/contest/precinct district associations from csv file.
Ballot Layout Manager	1.2	Add images to ballot in instruction block
Ballot Layout Manager	1.2	Add list of assigned precincts for ballotstyle on ballot
Ballot Layout Manager	1.2	Add more complete contest preview for formatting checks.
Ballot Layout Manager	1.2	Add OVI Text field additions
Ballot Layout Manager	1.2	Add Red Corner markers to ballot if target is red.
Ballot Layout Manager	1.2	Add report with Precinct Name, ID and Ballotstyle
Ballot Layout Manager	1.2	Allow a contest to contain a blank line without selection block
Ballot Layout Manager	1.2	Allow graphics to put a rectangle with party specific color on ballot
Ballot Layout Manager	1.2	Allow jurisdiction to set contest specific measure selections (yes/no, for/against, for the bond/against the bond) etc.
Ballot Layout Manager	1.2	Allow users to set write in description text
Ballot Layout Manager	1.2	Assign Text blocks to districts
Ballot Layout Manager	1.2	BLM Reports - Election Proof or Ballot Proof Report to mimic ballot structure
Ballot Layout Manager	1.2	Change Precinct District report to more list format, no abbrev
Ballot Layout Manager	1.2	CSV file for ballot ordering changes
Ballot Layout Manager	1.2	Generate by Ballotstyle Headers (H ballots) and by Precinct Headers (B ballots w/ no data) as a separate export from the regular BLM export.
Ballot Layout Manager	1.2	Generate separate ballotstyles (with IDs) for each party in a primary to minimize number of distinct ballotstyles.
Ballot Layout Manager	1.2	Increase number of spaces allowed for instruction text
Ballot Layout Manager	1.2	Interface for adding images and text to ballot (in static locations)
Ballot Layout Manager	1.2	Manual write in changes
Ballot Layout Manager	1.2	Manually set contest/candidate IDs
Ballot Layout Manager	1.2	Multiple Straight Ticket Layout Options
Ballot Layout Manager	1.2	Prevent duplicate precinct names
Ballot Layout Manager	1.2	Put party abbreviation next to candidate name in candidate list to assist with identification and ordering
Ballot Layout Manager	1.2	Put precinct name in center of header cards
Ballot Layout Manager	1.2	Automatically merge boxes around contest group. Close at top and bottom of column. Prevent groups from breaking across column/page. Repeat headers at top of new column
Ballot Layout Manager	1.2	Minimize horizontal lines but make sure there is line at bottom write in to separate from next contest

Module Affected	Version	Description
Ballot Layout Manager	1.2	Option to show "older" layout with vote for under contests title and not part of extra text.
Ballot Layout Manager	1.2	Roll up to parent if all splits have same ballotstyle
Ballot Layout Manager, Election Manager	1.2	Straight ticket rule option (Fill or override)
Ballot Layout Manager, Election Manager	1.2	Add button after report or ballot export to open directory where the export is located.
Ballot Layout Manager, Election Manager, OVI	1.2	Add candidate layout where description text displays candidate name.
Ballot Layout Manager, OVO, OVCS	1.2	Option - Allow size of write in space to be 1/2" or 1/4"
Ballot Layout Manager	1.2	Options to put vote for text either within colored header block, or below in contest text area on printed ballots only
Ballot Layout Manager, OVI	1.2	Assign different header colors to measures vs. offices (Printed and OVI)
Ballot Layout Manager, Election Manager, OVO	1.2	Option to hide “Ignore Validation” checkbox on OVO and to customize text
Ballot Layout Manager, OVI	1.2	Text area in Judicial Retention Contests should be filled with measure color
Election Manager	1.2	Add option for deleting Election definition on TM after load
Election Manager	1.2	Add option for OVI ballots to be validated in election day session
Ballot Layout Manager, Election Manager	1.2	Add separate instruction set for Straight Ticket to EM database to be appended the OVI instructions in straight ticket elections.
Election Manager	1.2	Make all selections affirmative for options screens.
Election Manager	1.2	Option for default report order in OVO (By Winner or by Ballot Default Order)
Election Manager	1.2	Remove 'view ballots' function from EM main screen.
Election Manager	1.2	Split Options tabs into Common, OVO, and OVI.
Election Manager, OVI	1.2	Create separate 'password protect' option for the OVI and OVO.
Election Manager, OVI	1.2	Hide election password screen (EM option) default false
Election Manager, OVO	1.2	Remove tally report copies EM option and its related code.
Election Manager, OVO	1.2	Add EM option to allow over/under voting totals to appear on Close voting report
Election Manager, OVO	1.2	Handle 1000 characters for signature line on OVO reports
Election Manager, OVO	1.2	Option to consolidate tally (separate precincts tallies available from maintenance screen)
Election Manager, OVO	1.2	Option to sort candidates by winner/candidate order
Election Manager, OVO	1.2	Optionally Validate OVI Ballots
Election Manager, OVO	1.2	Show/Hide public count on voter screen
Election Manager, OVO	1.2	Option to hide Public Count on OVO's main voting screen
Election Manager, OVO	1.2	Remove "Allow Add Precinct Option"
OpenElect Central Suite	1.2	Replace RoboHelp/JavaHelp with PDFHelp - OCS Help screen
OpenElect Central Suite Linux	1.2	Add script on ROOT desktop to activate Log printer for OCS. Script will add/update log.property file for these OCS apps - TM, TR, OVCS.
OVI	1.2	OVI candidate formatting need to mirror ballot
OVI	1.2	Add continue when a contest is continued to a new column/page.
OVI	1.2	Add election title to OVI ballot
OVI	1.2	High contrast mode on OVI

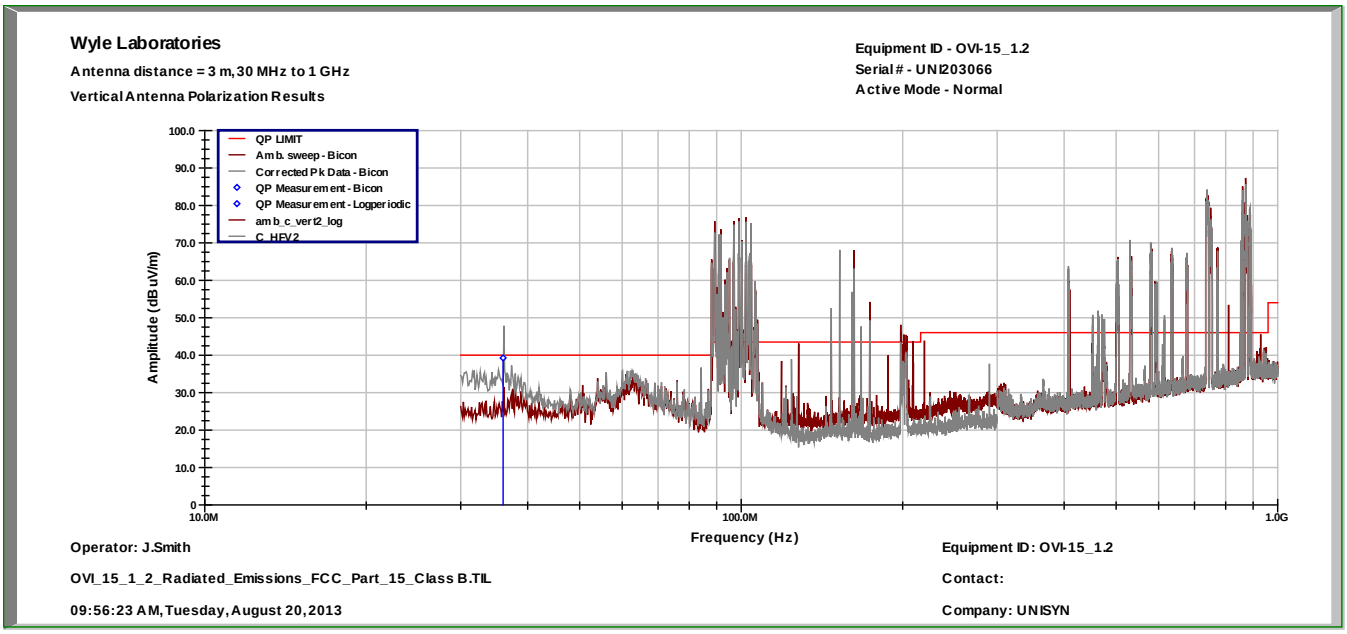
Module Affected	Version	Description
OVI	1.2	OVI Straight ticket display - looks like ballot
OVI	1.2	Remove Blackmarks detection
OVI	1.2	Show Ballot Headers on OVI
OVI	1.2	Show Contest Extra Text on OVI
OVI	1.2	Update voter interface to allow flexibility of font, field size
OVI	1.2	Add Open/Close Primary handling on OVI
OVI-VC	1.2	Update Motherboard/OS
OVO	1.2	Print precinct ID on zero count and tally report
OVO	1.2	Enable All sessions to accept all ballot types if enabled by Supervisor password
OVO	1.2	Ability to initialize all splits from a parent header.
OVO	1.2	Add “Print Copy” on header/close screen for printing multiple zero/tally tapes.
OVO	1.2	Allow access to admin menu from input header screen with visible button
OVO	1.2	Allow interrupt of thank you message / ballot will be processed immediately on insert of next ballot
OVO	1.2	Allow multiple election day sessions.
OVO	1.2	Allow multiple sessions on an OVO (if clean TM utilized for each) regardless of machine state/Date
OVO	1.2	Auto initialize all absentee precincts in absentee by ballotstyle session
OVO	1.2	Change images from BMP to PNG format
OVO	1.2	Change OVO printer to use out of paper instead of low paper
OVO	1.2	Diagnostics - Add display of scanned image
OVO	1.2	Diagnostics - Scanner and display calibration
OVO	1.2	Hold onto log files, except when reloading election. Need to have continuous record from load to load of a machine.
OVO	1.2	If a split in a primary in initialized, any parties, if any, that are assigned to the parent, would need to be initialized.
OVO	1.2	If 'consolidated tally' flag is set in EM show only consolidated tally on Admin->View Summary (already doing this); but on the Maint->View Summary allow each precinct to prints its own tally.
OVO	1.2	Improve write-in visibility on report and images
OVO	1.2	Move “Bypass Validation” checkbox to right sided of screen so don't accidentally hit the hidden admin menu button.
OVO	1.2	Option to print detailed page count data (by split/party) on OVO summary (maintenance)
OVO	1.2	Pre-Initialize Precincts for use when polls open
OVO	1.2	Put “Write in report” button on close screen
OVO	1.2	Put Image Export button on the Admin menu.
OVO	1.2	Show absentee totals on tape if after close time
OVO	1.2	Vote Center election day session
OVO	1.2	Portable Ballot Box
OVO, OVCS	1.2	Allow ballot type validation flexibility
OVO, OVCS	1.2	Allow LAT to choose which vote type to record too (ED, EV, P, A).
OVO, OVI	1.2	Allow Load on Election Day

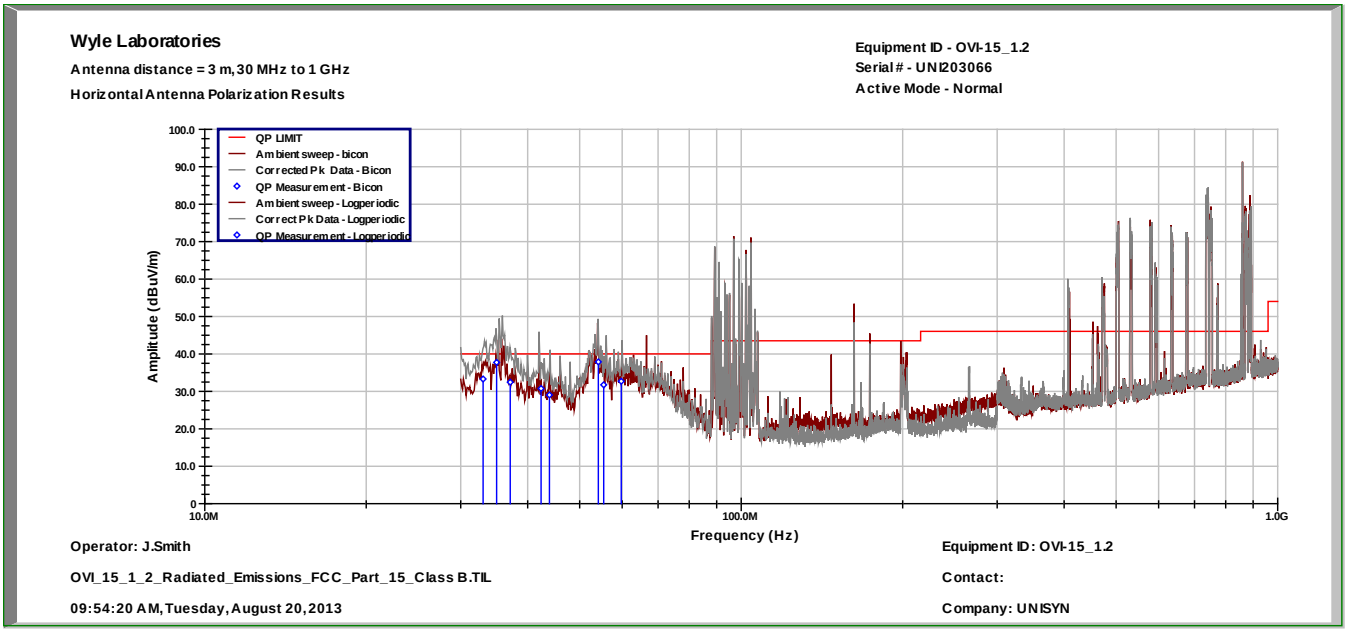
Module Affected	Version	Description
OVO, OVI	1.2	OVI - Add "**" prefix to position ID on OVI ballot. OVO - Add total number of write-ins (vs. number being printed) to write in report so they know how many they are looking for in manual process.
OVO, OVI	1.2	Load Election from USB
OVO, OVI	1.2	Add manufacturing details to Machine Info Report
OVO, OVI, OVCS, Ballot Layout Manager	1.2	Add Left Target support on Ballot (Previously only right side targets supported) - Not supported with RCV.
Tabulator	1.2	Improve functionality of Manual Entry/Manual Adjustment
Tabulator	1.2	Add Real Time Log printer with non-burstable paper to record all Tabulator functions (OVCS, TM, TR)
Tabulator	1.2	Manual Entry - Remove contest panel on left side of screen, instead show all contests sequentially on a scrollable screen.
Tabulator	1.2	Option to show/hide absentee precinct (absentee by ballotstyle) as part of total precinct count.
Tabulator	1.2	Ability to rename session type titles (Used by TR)
Tabulator	1.2	Negative Manual entry – allow session that removes ballots from totals
Tabulator	1.2	Upload and manage Voter Registration by Split (similar to SOVC)
Tabulator	1.2	Export Data to flat file
Tabulator, Tabulator Reports	1.2	Add precinct order values on export to improve report readability on tabulator
Tabulator, Tabulator Reports	1.2	Upload votes by type and source - Required for SOVC reporting
Tabulator, Tabulator Reports	1.2	Write in appear after official candidates in report default order
Tabulator Client	1.2	Allow for ballot image files to be in multiple files
Tabulator Client	1.2	Allow upload of USB with multiple machines data in different "Data" directories.
Tabulator Client	1.2	Implement two-stage upload process in TC similar to OVCS.
Tabulator Client	1.2	Improving upload interface to the tabulator - including adding an escrow ability so that TMs can be uploaded to hard drive, but not tabulator, allowing them to be validated and stored securely without tally, allows for more frequent download for OVO)
Tabulator Client	1.2	TC will handle escrow of uploaded TM sessions similar to the OVCS before uploading to Tabulator.
Tabulator Reports	1.2	Add display options for the Election Summary and Detail reports.
Tabulator Reports	1.2	Remove the Over/Under report.
Tabulator Reports	1.2	Show or Hide aggregate totals
Tabulator Reports	1.2	Change user timeout to 30 minutes
Tabulator Reports	1.2	Election detail similar formatting to election summary
Tabulator Reports	1.2	Election Summary Report changes
Tabulator Reports	1.2	Move standalone Election Summary to TR.
Tabulator Reports	1.2	Option to sort candidates by winner/candidate order
Tabulator Reports	1.2	SOVC Report changes
Tabulator Reports	1.2	Voter Turnout report changes

APPENDIX B

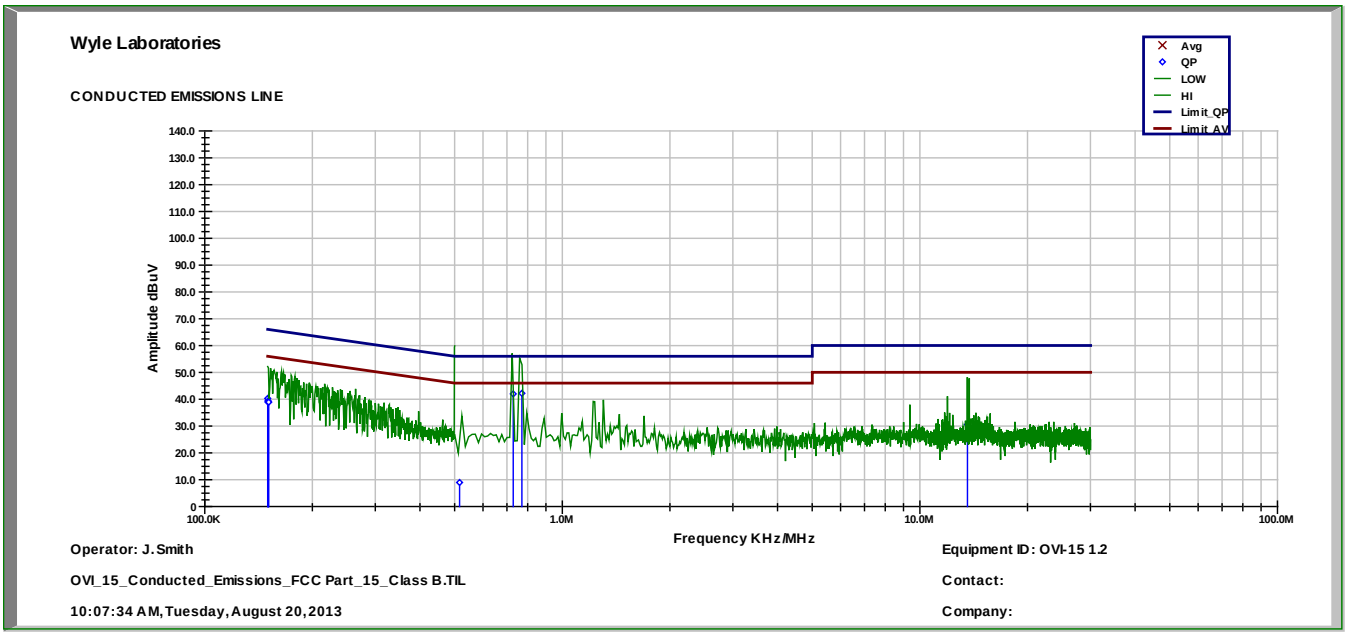
HARDWARE TEST DATA SHEETS

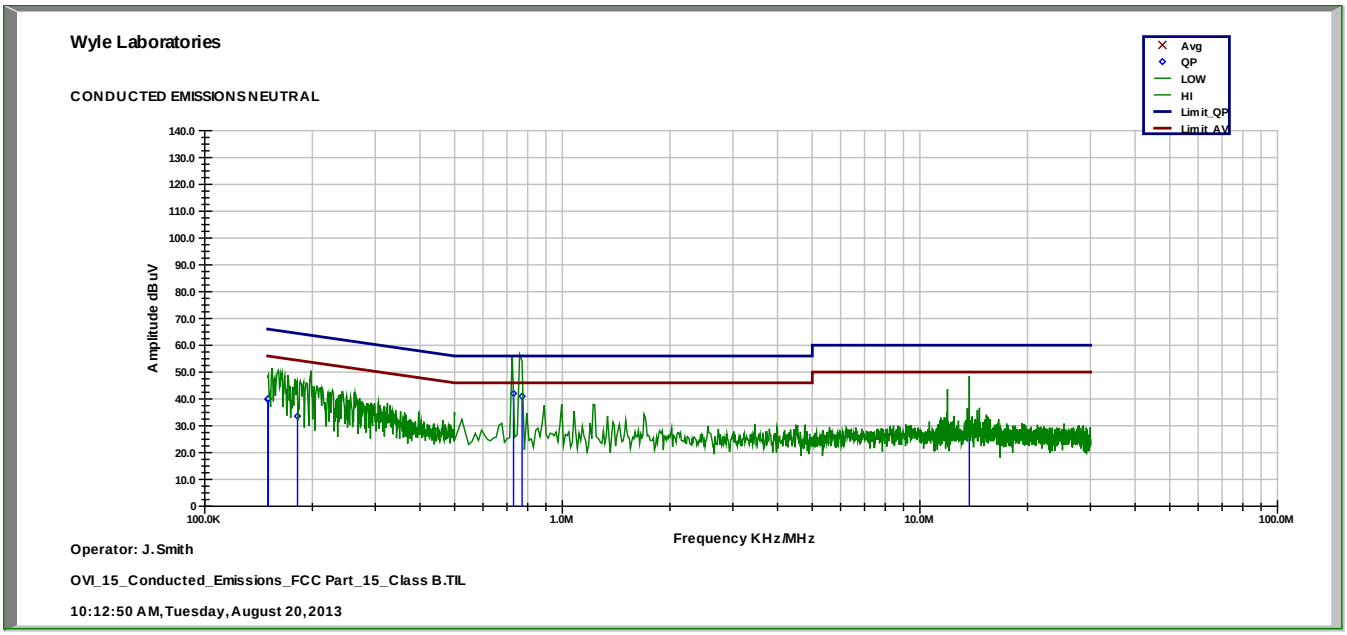
Electromagnetic Radiation





Electromagnetic Radiation (Continued)





Electrostatic Disruption

wyle laboratories

DATA SHEET

Job No.: T70987.01
Start Date: 9/6/2013

Customer: Unisyn
EUT: OVI-VC (15")
Model No.: OpenElect Voting Interface
Serial No.: UNI203066

Temperature: 67.28°F
Humidity: 55.2%
Measurement Point: See Test Points Below
Interference Signal: See Applied Signal
Frequency Range: N/A

Test Title: Electrostatic Disruption

Test Points	Meets Limit		Applied Level (kV)	Discharge Type	Times Tested	Comments
	Yes	No				
TP001: Horizontal Coupling Plane	X		±8	Contact	10	Each Side of EUT; Discharged
TP002: Vertical Coupling Plane	X		±8	Contact	10	Each Side of EUT; Discharged
TP003: Keyhole	X		±8	Contact	10	Discharged
TP004: Right Side of OVI, Lower Chassis	X		±8	Contact	10	Discharged
TP005: Left Side of OVI, Lower Chassis	X		±8	Contact	10	Discharged
TP006: Back of OVI Right Screen Brace	X		±8	Contact	10	Discharged
TP007: Back of OVI, Right Side, Rivet	X		±8	Contact	10	Discharged
TP008: Back of OVI, Left Side, ATI Connector	X		±8	Contact	10	Discharged
TP009: Back of OVI, ATI Holder	X		±8	Contact	10	Discharged
TP010: Right Side of OVI, Screen Brace	X		±8	Contact	10	Discharged
TP011: Monitor AC Adapter Light	X		±2, 4, 8, 15	Air	10	±2, 4, 8 – No Discharge; ±15 – Discharged
TP012: Monitor Top Side	X		±2, 4, 8, 15	Air	10	±2, 4, 8 – No Discharge; ±15 – Discharged
TP013: Monitor AC Adapter Side	X		±2, 4, 8, 15	Air	10	±2, 4, 8 – No Discharge; ±15 – Discharged
TP014: Monitor Upper Left Corner	X		±2, 4, 8, 15	Air	10	±2, 4, 8, 15 – No Discharge
TP015: Monitor Lower Left Corner	X		±2, 4, 8, 15	Air	10	±2, 4, 8 – No Discharge; ±15 – 1 Discharge Per Polarity
TP016: Monitor Center	X		±2, 4, 8, 15	Air	10	±2, 4 – No Discharge; ±8 – 1 Discharge Per Polarity; +15 – No Discharge; -15 – 1 Discharge
TP017: Monitor Status Light	X		±2, 4, 8, 15	Air	10	±2, 4, 8, 15 – No Discharge
TP018: Monitor Lower Right Corner	X		±2, 4, 8, 15	Air	10	±2, 4, 8, 15 – No Discharge

Notice of Anomaly: _____

Witness: _____

Tested By: _____ Date: 9/6/13
Technician

Approved: _____ Date: 9/7/13
Project Engineer

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Electrostatic Disruption (Continued)

wyle laboratories

DATA SHEET

Job No.: T70987.01
Start Date: 9/6/2013

Customer:	Unisyn	Temperature:	67.28°F	Humidity:	55.2%
EUT:	OVI-VC (15")	Measurement Point:	See Test Points Below		
Model No.:	OpenElect Voting Interface	Interference Signal:	See Applied Signal		
Serial No.:	UNI203066	Frequency Range:	N/A		

Test Title: Electrostatic Disruption

Test Points	Meets Limit		Applied Level (kV)	Discharge Type	Times Tested	Comments
	Yes	No				
TP019: Monitor Upper Right Corner	X		±2, 4, 8, 15	Air	10	±2, 4, 8, 15 – No Discharge
TP020: Monitor Power Button	X		±2, 4, 8, 15	Air	10	±2, 4, 8 – No Discharge; +15 – 1 Discharge; -15 – 8 Discharges
TP021: Monitor Right Side	X		±2, 4, 8, 15	Air	10	±2, 4, 8, 15 – No Discharge
TP022: Monitor Left Side	X		±2, 4, 8, 15	Air	10	±2, 4, 8, 15 – No Discharge
TP023: OVI Case Left of Printer	X		±2, 4, 8, 15	Air	10	±2, 4, 8, 15 – No Discharge
TP024: OVI Case Below Printer	X		±2, 4, 8, 15	Air	10	±2, 4, 8, 15 – No Discharge
TP025: OVI Case Front, Gasket	X		±2, 4, 8, 15	Air	10	±2, 4 – No Discharge; +8 – 6 Discharges; -8 – 8 Discharges; ±15 – Discharged
TP026: OVI Case Right Side, Gasket	X		±2, 4, 8, 15	Air	10	±2, 4 – No Discharge; ±8, 15 – Discharged
TP027: OVI Back, Power Switch	X		±2, 4, 8, 15	Air	10	±2, 4, 8, 15 – No Discharge

Notice of Anomaly: _____

Witness: _____

Tested By: _____ Technician Date: 9/6/13

Approved: _____ Project Engineer Date: 9/7/13

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WH-1433, Rev. Dec. 2004

Electromagnetic Susceptibility

wyle laboratories

DATA SHEET

Job No.: T70987.01
Start Date: 03 Sept 13

Customer: ILTS
Temperature: 22.8° C
Humidity: 64.6%
EUT: OVI-VC (15")
Measurement Point: EUT @ All Four Sides
Model No.: OpenElect Voting Interface
Interference Signal: 1Khz @ 80% AM
Serial No.: UNI203066
Frequency Range: 80Mhz to 1Ghz

Test Title EN 61000-4-3 (Electromagnetic Susceptibility)

Test Frequency	Meets Limit		Susceptibility Threshold Level	Maximum Signal Applied	Comments
( )kHz (X)MHz ( )GHz	Yes	No	( )A ( )V ( )kV (X)V/m ( )Vrms ( )dBμA ( )dBμV ( )dBμV/m ( )dBpT		
80	X		>10	10	Vertical and Horizontal
↓	↓		↓	↓	↓
1,000	X		>10	10	Vertical and Horizontal

Notice of Anomaly: N/A
Witness: N/A

Tested By: [signature] Technician Date: 09/03/13
Approved: [signature] Project Engineer Date: 9/3/13

Page 1 of 1

WH-1432, Rev. Dec. 2004

Conducted RF Immunity

wyle laboratories

DATA SHEET

Job No.: T70987.01
Start Date: 09 Sep 13

Customer: ILTS
Temperature: 27.7° C
Humidity: 46.7%
EUT: OVI-VC (15")
Measurement Point: See Comments Below
Model No.: OpenElect Voting Interface
Interference Signal: 1Khz @ 80% AM
Serial No.: UNI203066
Frequency Range: 150Khz to 80Mhz

Test Title EN 61000-4-6 (Conducted RF Immunity)

Test Frequency	Meets Limit		Susceptibility Threshold Level	Maximum Signal Applied	Comments
( )kHz (X)MHz ( )GHz	Yes	No	( )A ( )V ( )kV ( )dBµA ( )dBµV ( )dBµV/m	( )V/m (X)Vrms ( )dBpT	
.150	X		>10	10	AC Input
↓	↓		↓	↓	↓
80	X		>10	10	AC Input

Notice of Anomaly: N/A
Witness: N/A

Tested By: Ryan J Church Technician Date: 09/09/2013
Approved: Steph Ha Project Engineer Date: 9/9/13

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Magnetic Fields Immunity

wyle laboratories

DATA SHEET

Job No.: T70987.01
Start Date: 20 Aug 13

Customer: ILTS
EUT: OVI-VC (15")
Model No.: OpenElect Voting Interface
Serial No.: UNI203066
Temperature: 22.9° C
Humidity: 45.6%
Measurement Point: See Comments Below
Interference Signal: CW for a Period of 5 Minutes
Frequency Range: See Test Frequencies Below

Test Title EN 61000-4-8 (Magnetic Field Immunity)

Test Frequency	Meets Limit		Susceptibility Threshold Level	Maximum Signal Applied	Comments
(X)kHz ( )MHz ( )GHz	Yes	No	(X)A ( )V ( )kV ( )V/m ( )Vrms ( )dBμA ( )dBμV ( )dBμV/m ( )dBpT		
.060	X		>30 A/m	30 A/m	EUT on X, Y, and Z Axis

Notice of Anomaly: N/A
Witness: N/A

Tested By: Technician Date: 08/20/2013
Approved: Project Engineer Date: 8/20/13

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APPENDIX C

HARDWARE TEST INSTRUMENTATION SHEETS

Electromagnetic Susceptibility

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 9/3/2013 JOB NUMBER: T70987.01 TYPE OF TEST VVSG 4.1.2.10(EST)

TECHNICIAN: R.CHAMBERS CUSTOMER: ILTS TEST AREA: EMI CHAMBER#3

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	AMPLIFIER	AMP RESEARCH	500W1000A	25361	03141	80MHz to 1GHz	NCR	8/26/2013	8/26/2014
2	ANTENNA	AR	AT6080	0330329	02247	80-6000MHz	NCR	3/28/2011	3/28/2020
3	DATALOGGER	EXTECH	42280	9051859	04926	-4°F to 144°F/0-	±1°F / ±3%RH	5/14/2013	5/14/2014
4	DIR COUPLER	AMP RESEARCH	DC6180	0340748	01678	80-1000MHZ	±0.5db	8/5/2013	8/5/2014
5	ISOTROPIC PROBE	AMP RESEARCH	FP2000	17657	L17657	10 KHz - 1 GHz	±0.7 dB	11/8/2012	11/8/2013
6	SIG GEN	MARCONI	2023	112224/092	L12224	9kHz-1.2GHz	±0.8dB	2/11/2013	2/11/2014
7	SPEC ANAL	AGILENT	E4446A	MY46180335	R80335	MFG	MFG	6/19/2013	6/19/2014
8	TAPE MEASURER	LUFKIN	HV1048CME	NSN	02708	8meters	±1mm	4/24/2012	4/24/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 9/3/13 CHECKED & RECEIVED BY: 09/03/2013

Q.A.: 9/3/13

WH-1029A,REV,APR99

Page 1 of 1

Conducted RF Immunity

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 9/6/2013 JOB NUMBER: T70987.01 TYPE OF TEST VVSG 4.1.2.11(CRFI)

TECHNICIAN: R. CHAMBERS CUSTOMER: UNISYN TEST AREA: EMI CHAMBER#3

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	AMPLIFIER	AR	2500A225	0342861	03485	MFG	NCR	7/24/2013	7/24/2020
2	ATTEN	BIRD	25-T-MN	0129	03142	50 OHMS 25 W.	MFG	6/24/2013	6/24/2014
3	ATTENUATOR	NARDA	769-6	03180	04860	DC to 6GHz	MFG	3/25/2013	3/25/2014
4	DATALOGGER	EXTECH	42280	9051859	04926	-4°F to 144°F/0-	±1°F / ±3%RH	5/14/2013	5/14/2014
5	DIR COUPLER	AMP RESEARCH	DC3010	304022	117208	.01-1000MHz	±0.8dB	5/15/2013	5/15/2014
6	DMM	FLUKE	87V	18290046	01474	4VDC	±0.1%+1	12/6/2012	12/6/2013
7	PASS IMP ADAPT	FISHER CC	FCC-801-150-50-CDI	9784	116854	150KHz-230MH	MFG	6/24/2013	6/24/2014
8	PASSIVE	FISHER CC	FCC-801-150-50-CDI	04049/04050	110405	150KHZ - 230M	MFG	7/20/2012	7/20/2014
9	SIG GEN	MARCONI	2023	112224/092	L12224	9kHz-1.2GHz	±0.8dB	2/11/2013	2/11/2014
10	SPEC ANAL	AGILENT	E4446A	MY46180335	R80335	MFG	MFG	6/19/2013	6/19/2014
11	SPEC ANAL	AGILENT	E4446A/H70	US44020335	03123	MFG	MFG	5/10/2013	5/10/2014
12	TAPE MEASURER	LUFKIN	HV1048CME	NSN	02708	8meters	±1mm	4/24/2012	4/24/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 9/6/13 CHECKED & RECEIVED BY: 09/06/2013

Q.A.: 9/6/13

WH-1029A,REV,APR'99

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Magnetic Fields Immunity

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 8/20/2013 JOB NUMBER: T70987 TYPE OF TEST VVSG 4.1.2.12 MFI WOP15

TECHNICIAN: R.CHAMBERS CUSTOMER: ILTS TEST AREA: EMI CHAMBER#3

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	AMPLIFIER	TECHRON	7560	015075	04566	600W	NCR	7/8/2008	7/8/2020 *
2	DMM	FLUKE	87V	18290046	01474	4VDC	±0.1%+1	12/6/2012	12/6/2013 *
3	METER	HOLADAY	HOL-HI3604	76285	117549	30-2KHz	MFG	2/24/2012	2/24/2014 *
4	STOP WATCH	HANHART	STRATOS1	110131	110131	10HR	5 sec/day	6/24/2013	6/24/2014 *
5	TAPE MEASURER	LUFKIN	HV1048CME	NSN	02708	8meters	±1mm	4/24/2012	4/24/2014 *
6	WAVE GEN	AGILENT	33250A	SG40007026	014181	MULTI	CERT	12/18/2012	12/28/2013 *

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: W. Bush 8/20/13 CHECKED & RECEIVED BY: 08/20/2013

Q.A.: 8/20/2013

WH-1029A,REV.APR'99

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Acoustic Sound Level

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 10/2/2013 JOB NUMBER: T70987.01 TYPE OF TEST ACOUSTIC

TECHNICIAN: D. LEE CUSTOMER: UNISYN TEST AREA: CHAMBER I

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	SOUND LVL MTR	EXTECH	407736	010305516	116831	35-130 dB	±1.5dB	10/1/2013	10/10/2013

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: Darrin Lee 10/02/13 CHECKED & RECEIVED BY: [signature] 10/02/13

Q.A.: [signature] 10/2/13

WH-1029A,REV,APR'99

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Electromagnetic Radiation

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 8/20/2013 JOB NUMBER: T70987 TYPE OF TEST FCC PART 15

TECHNICIAN: J. SMITH CUSTOMER: UNISYN TEST AREA: OATS 2

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	ANTENNA	EMCO	3108	2322	109732	MULTI	CERT	8/28/2012	8/28/2014
2	ANTENNA	EMCO	3146A	9008-1134	108892	300-1000MHz	±2db	6/29/2012	6/29/2014
3	DMM	FLUKE	87	64440152	112518	MULTI	±0.1%+1	6/14/2013	6/14/2014
4	EMI TEST RCVR	ROHDE SCHWAR	ESCI	100386	117803	MULTI	MFG	4/1/2013	4/1/2014
5	LISN	SOLAR	21107-50-TS-50-N	1125262	01682	MFG	MFG	8/7/2012	8/7/2014
6	LISN	SOLAR	21107-50-TS-50-N	1125263	01683	MFG	MFG	8/7/2012	8/7/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: J Smith 8-20-13 CHECKED & RECEIVED BY: [signature] 8-20-13

Q.A.: [signature] 8-20-13

WH-1029A,REV,APR'99

Page 1 of 1

Electrostatic Disruption

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 9/6/2013 JOB NUMBER: T70987.01 TYPE OF TEST ESD

TECHNICIAN: R. WILSON CUSTOMER: UNISYN TEST AREA: PRODUCT SAFETY

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	DISCHARGE	EMC-PARTNER	ESD3000DM1	049	03229	150pF	MFG	7/30/2013	7/30/2014
2	ESD GUN	EMC-PARTNER	ESD3000	059	04446	16.5 KV	±10%	10/1/2012	10/1/2013
3	ESD TARGET	HAEFELY TRENCI	2520311	152461	110794	15KV	±5%	12/6/2011	12/6/2013
4	OSCILLOSCOPE	TEKTRONIX	DPO5104	C012091	01737	MFG	MFG	10/23/2012	10/23/2013
5	TAPE MEASURER	LUFKIN	HV1048CME	NSN	02708	8meters	±1mm	4/24/2012	4/24/2014
6	TEMP/HUM/BAR	EXTECH	SD700	Q590477	01539	MULTI	MFG	2/27/2013	2/27/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 9/6/13 CHECKED & RECEIVED BY: 9/6/13

Q.A.: 9/6/13

WH-1029A,REV.APR'99

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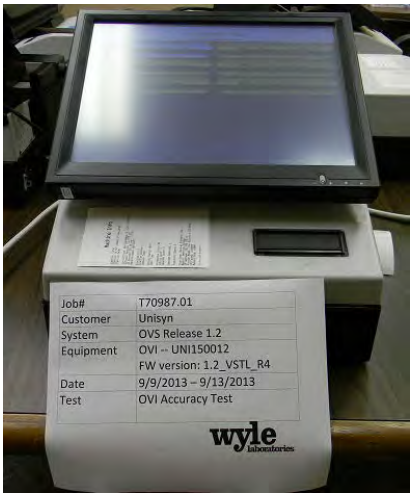
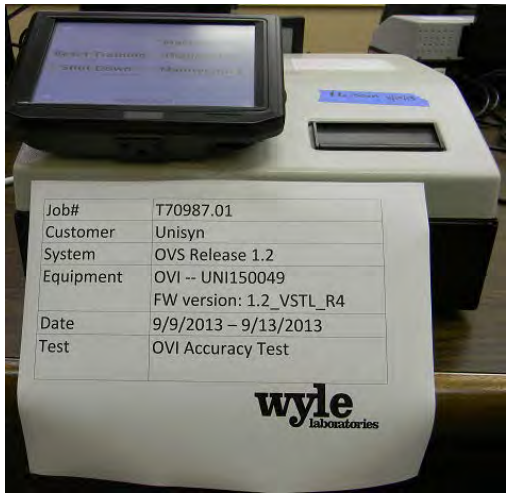
APPENDIX D

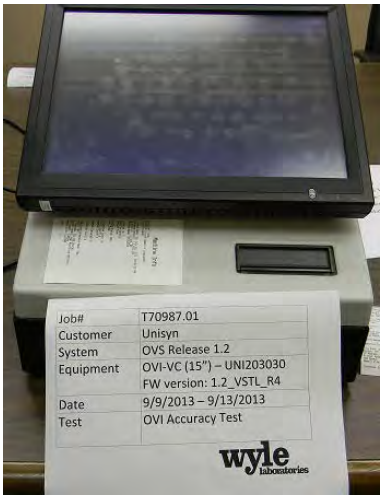
PHOTOGRAPHS

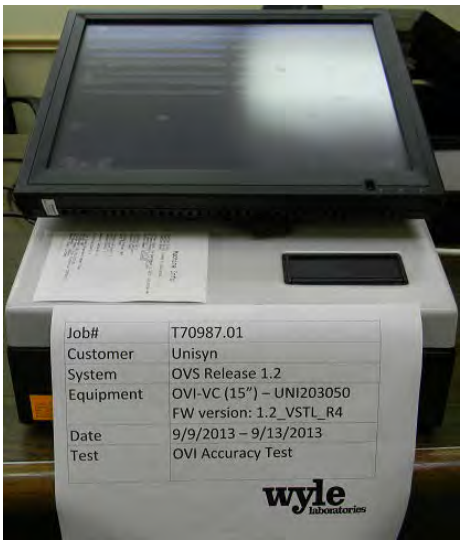
Photograph 1
OVO Accuracy Test Setup

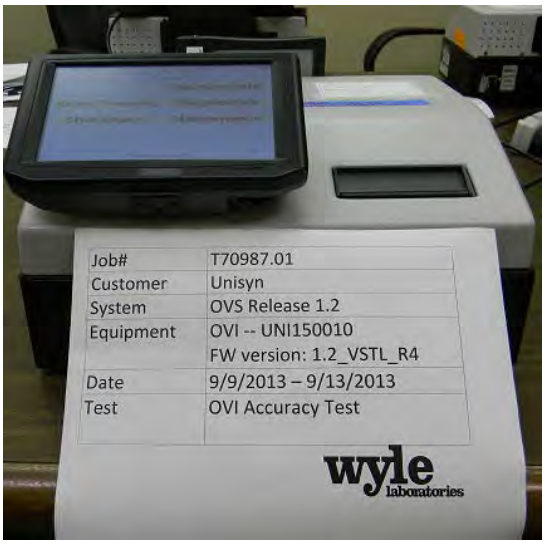
Photograph 2
OVCS Accuracy Test Setup



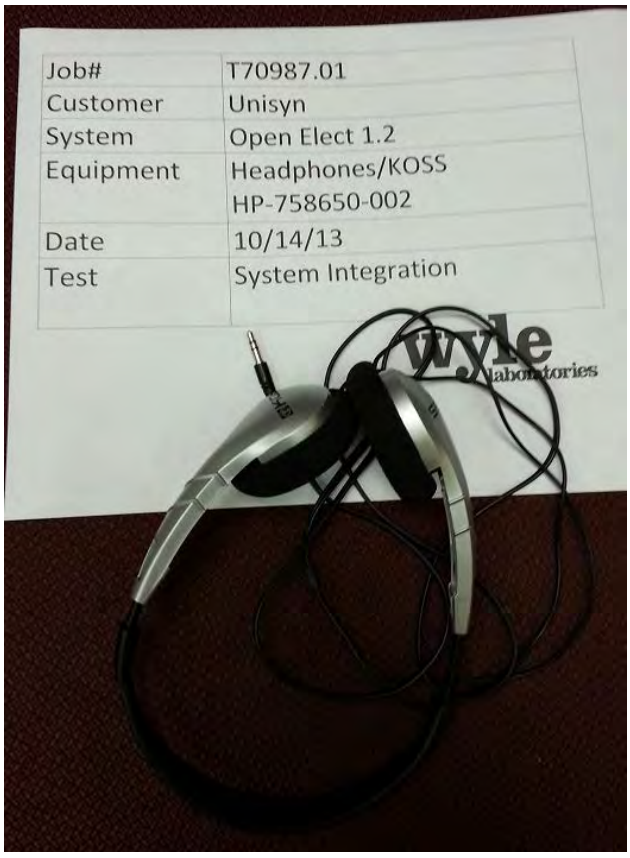




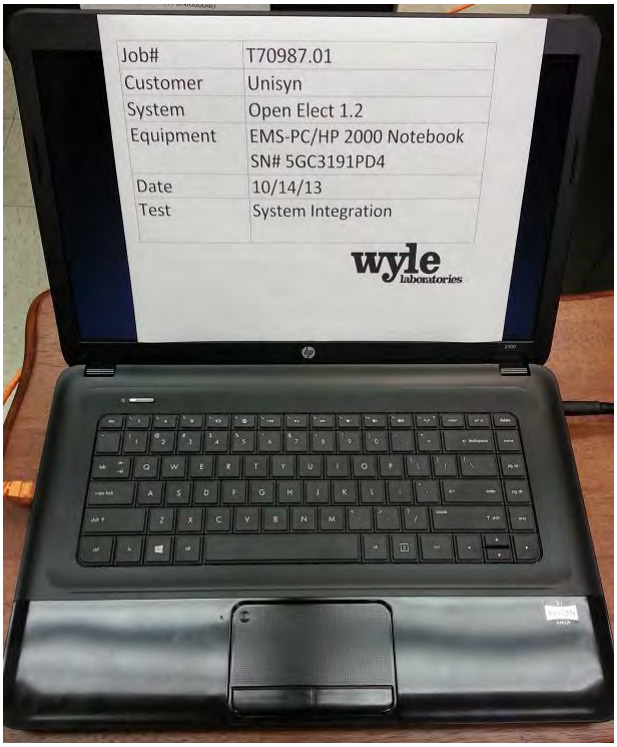


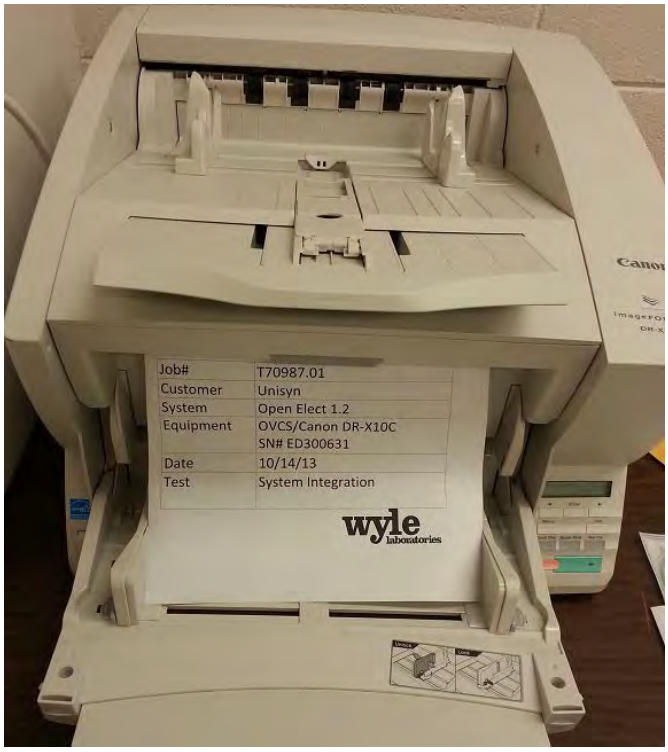


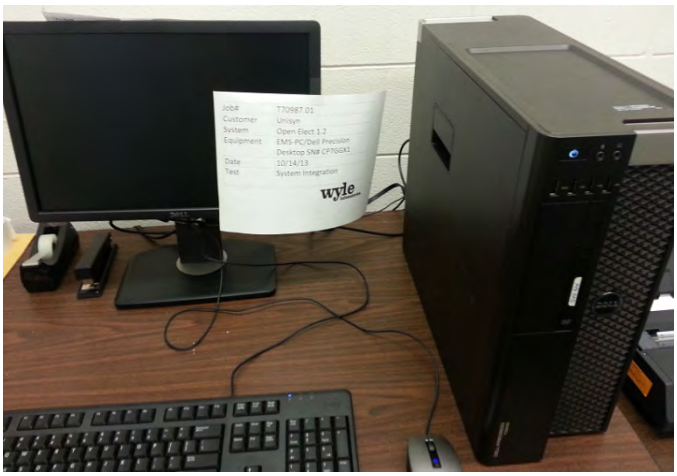
Photograph 3
OVI Accuracy Test Setup



Photograph 4
System Integration Test Set Up

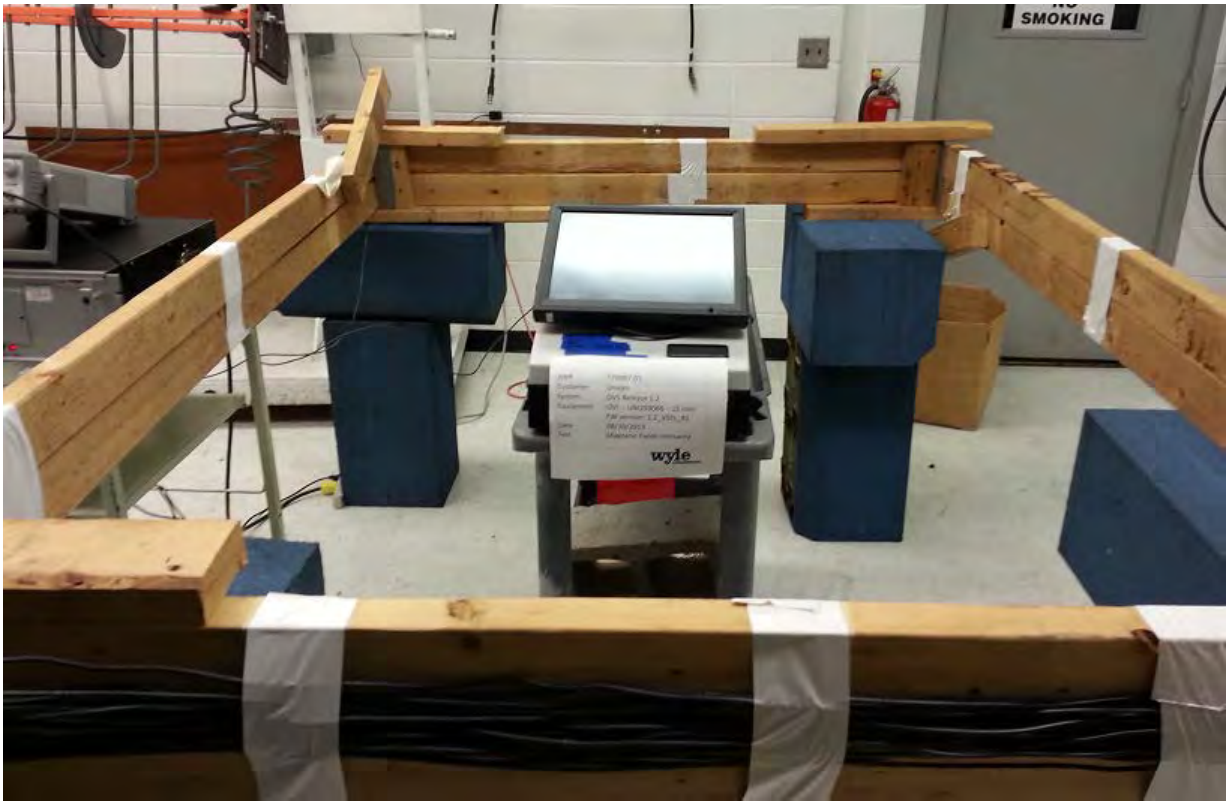






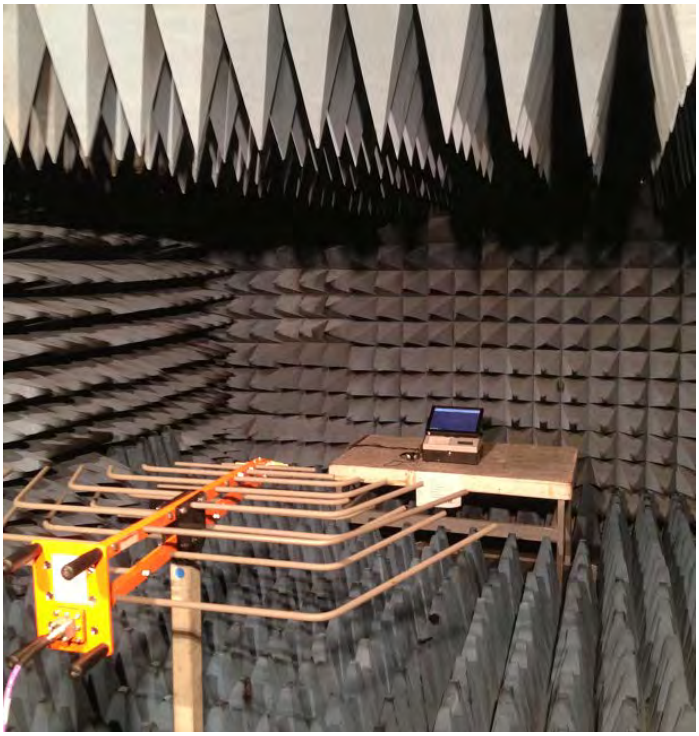
Photograph 5
System Integration Test Set Up (continued)

Photograph 6
Conducted RF Immunity Test Set Up

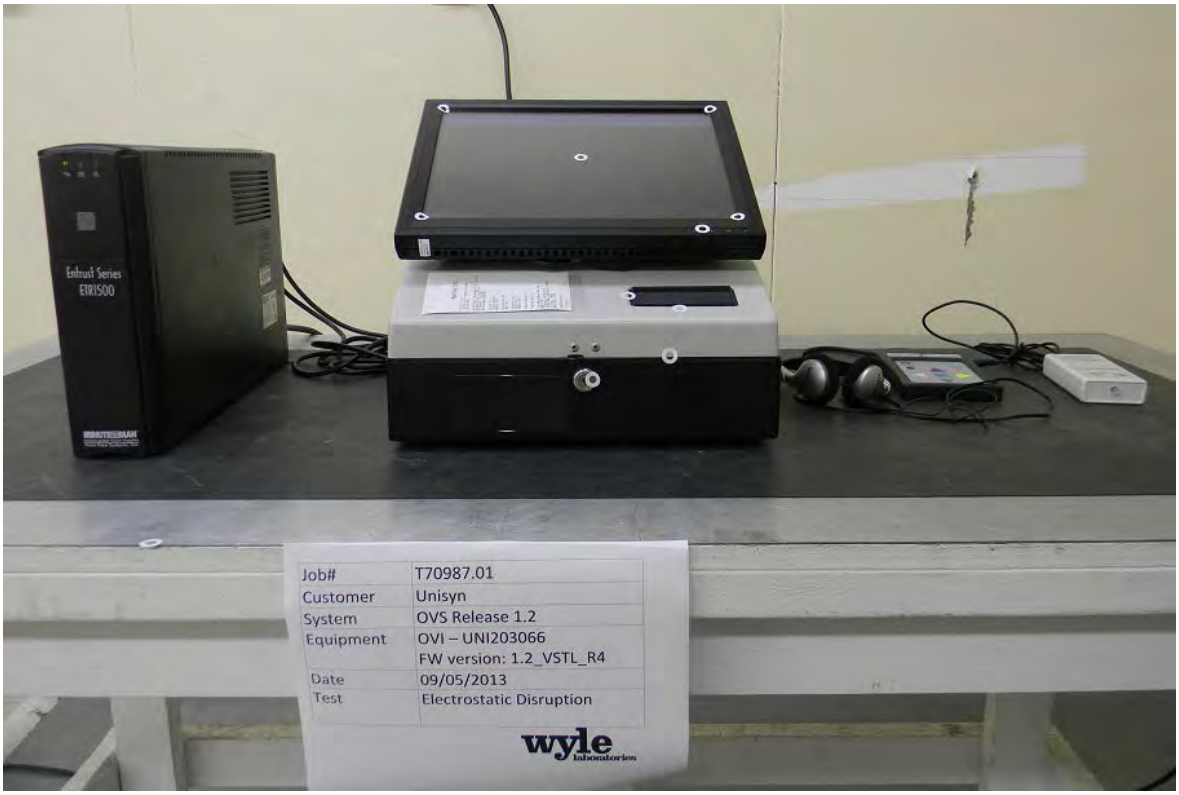


Photograph 7
Magnetic Fields Immunity Test Set Up

Photograph 8
Electromagnetic Radiation Test Set Up



Photograph 9
Electromagnetic Susceptibility Test Set Up



Photograph 10
Electrostatic Disruption Test Set Up

Photograph 11
Acoustic Sound Level Test Set Up

Photograph 12
Physical Security (Portable Ballot Box) Test Set Up

APPENDIX E

WYLE'S CERTIFICATION TEST PLAN AS RUN NO. T70987.01-01

7800 Highway 20 West
Huntsville, Alabama 35806
Phone (256) 837-4411
Fax (256) 721-0144
www.wylelabs.com

Job No. T70987.01
Test Plan No. T70987.01-01 Rev C
Oct 4, 2013

CERTIFICATION TEST PLAN

Prepared for:

Manufacturer Name	Unisyn Voting Solutions, Inc.
Manufacturer System	OpenElect Voting System, Release 1.2
EAC Application No.	UNS1301
Manufacturer Address	2310 Cousteau Court, Vista, CA 92012

NVLAP LAB CODE 200771-0

VSTL
EAC Lab Code 0704

wyle laboratories			**REPORT NO.** Test Plan T70987.01-01 Rev C **DATE** October 4, 2013
REV	DATE	PAGE OR PARAGRAPH AFFECTED	DESCRIPTION OF CHANGES
---	6-27-13	Entire Document	Original Release
A	7-18-13	Entire Document	Changes are highlighted
B	8-8-13	Entire Document	Highlights are removed
C	10-4-13	Entire Document	Updated to "As Run" Test Plan for Final Report

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APPENDICES

1.0 INTRODUCTION

The purpose of this National Certification Test Plan (Test Plan) is to document the procedures that Wyle Laboratories, Inc., will follow to perform certification testing of the Unisyn Voting Solutions (Unisyn), OpenElect Voting System Release 1.2 (OVS 1.2), to the requirements set forth for voting systems in the U.S. Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (EAC 2005 VVSG). Prior to submitting the System for certification testing, Unisyn submitted an application to the EAC for certification of the OVS 1.2 to the requirements of the EAC 2005 VVSG.

1.1 Scope

The purpose of this modification is to introduce the upgrade from the OVS 1.1 to the OVS 1.2 system. The system modifications include both hardware and software upgrades from the previously certified system.

1. OpenElect Central Suite (OCS) Election Management System (EMS) – Software upgrades and Hardware upgrades
2. OpenElect Voting Optical (OVO) – Software Upgrades and introduction of the portable ballot box
3. OpenElect Voting Interface (OVI-7) – Software Upgrades
4. OpenElect Voting Interface (OVI-VC) – Hardware and Software Upgrades
5. OpenElect Voting Central Scan (OVCS) – Software Upgrades

This update includes the addition of key items to base level functionality that improves the general usability of the system for both current and potential customers. These additions include improved flexibility of generating ballot PDFs, including adding of custom artwork to ballots, increasing the number of layout options for candidate data, and allowing both left or right hand side targets.

Additional functionality was added to improve efficiency for loading election data on the in-precinct units and removing the necessity of networking the OVI/OVO systems to the Election Server. Additional functionality was added to allow customers to predefine precinct definitions to remove the need for header cards, and the addition of consolidated session that accept all ballot styles.

A comprehensive redesign of the OVI voter interface was performed with the purpose of addressing formatting and usability requests from current customers and the ADA community thereby addressing items such as layout, screen structure, application flow, magnification, and brightness.

Customer feedback was used to improve the look and usability of election night reports, as well as inputting manual adjustments. A CSV export was also added, providing a comma delimited representation of the election: by precinct, by candidate, and by vote type (absentee, election day etc.)

Additional interface changes were made and options added throughout to generally enhance the usability of the system. These changes were based on Election Day observations of system usage in the field or in response to state specific election code.

Various hardware changes were introduced to keep pace with both current and expected obsolescence of system components.

Introduction of a portable ballot box that is collapsible and made of corrugated plastic.

Preliminary EMI Quick Scans were performed on the OVO and OVI units for comparison to the baseline emissions noted during prior test campaigns. Based on the results of the quick scans, Wyle determined that OVO, OVI and OVI-VC would require hardware tests as noted in tables 4-2 and 4-3.

1.0 INTRODUCTION (Continued)

1.1 Scope (Continued)

The complete system shall be tested in a full system integration test to ensure all components interact properly in the current system configurations.

At test conclusion, the results of all testing performed as part of this test program will be submitted to the EAC in the form of a final report.

1.2 References

The documents listed below were used in the development of the Test Plan and are utilized to perform certification testing.

- 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, effective date January 1, 2007
- Election Assistance Commission Voting System Test laboratory Program Manual, Version 1.0, effective date July 2008
- 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
- Wyle Laboratories' Test Guidelines Documents: EMI-001A, "Wyle Laboratories' 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"
- Wyle Laboratories' Quality Assurance Program Manual, Current Revision
- Wyle Laboratories Quality Assurance Manual, Current Revision
- 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 (listed on www.eac.gov)
- EAC Notices of Clarification (listed on www.eac.gov)
- EAC Quality Monitoring Program residing on:

  http://www.eac.gov/testing_and_certification/quality_monitoring_program.aspx

A listing of the OVS 1.2 System Technical Data Package (TDP) documents submitted for this certification test effort is listed in Section 4.6, TDP Evaluation table 4-4.

1.0 INTRODUCTION (Continued)

1.3 Terms and Abbreviations

This subsection defines all terms and abbreviations applicable to the development of this Test Plan.

Table 1-1 Terms and Abbreviations

Term	Abbreviation	Definition
Americans with Disabilities Act of 1990 (Amended 2008)	ADA	ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability.
Audio Tactile Interface	ATI	Voter interface designed to not require visual reading of a ballot. It is available on the OVI.
Configuration Management	CM	---
Commercial Off the Shelf	COTS	Commercial, readily available hardware or software
Direct Record Electronic	DRE	---
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 Management System	EMS	The Election Management System equivalent for the OVS 1.2 System.
Equipment Under Test	EUT	
Functional Configuration Audit	FCA	Exhaustive verification of every system function and combination of functions cited in the manufacturer's documentation.
Federal Communications Commission	FCC	---
Help America Vote Act	HAVA	Act created by United States Congress in 2002.
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.
OpenElect Central Suite	OCS	Unisyn's Election Management System
OpenElect Voting Central Scanner	OVCS	High-speed central ballot scan tabulator.
OpenElect Voting Optical	OVO	Precinct-level optical scanner and tabulator
OpenElect Voting Interface	OVI-7 OVI-VC	Used as a ballot marking device, ADA solution, and early voting device.
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. A trusted build of the executable system is performed to ensure the certified release is built from tested components.
Quality Assurance	QA	---
System Under Test	SUT	---
Test Case Procedure Specifications	TCPS	Wyle-developed document that specifies test items, input specifications, output specifications, environmental needs, special procedural requirements, inter-case dependencies, and all validated test cases that will be executed during the area under test.
Technical Data Package	TDP	Manufacturer documentation related to the voting system required to be submitted as a precondition of certification testing.
Underwriters Laboratories Inc.	UL	---
Uninterruptible Power Supply	UPS	---
Voluntary Voting System Guidelines	EAC 2005 VVSG	Published by the EAC, the third iteration of national level voting system standards.
Wyle Operating Procedure	WoP	Wyle Test Method or Test Procedure.

1.0 INTRODUCTION (Continued)

1.4 Testing Responsibilities

All core and non-core software and hardware certification testing will be conducted under the guidance of Wyle Laboratories, Inc., by personnel verified by Wyle to be qualified to perform the testing.

1.4.1 Project Schedule

This information is contained in a Wyle-generated Microsoft Project schedule. This schedule is presented in Appendix A "Unisyn Project Schedule." The dates on the schedule are not firm dates but planned estimates presented for informational purposes.

1.4.1.1 Owner Assignments

This information is contained in a Wyle generated Microsoft Project schedule. This schedule is presented in Appendix A "Unisyn Project Schedule."

1.4.1.2 Test Case Development

Wyle will utilize the "Wyle Baseline Test Cases" for the Usability and System Integration Tests. These will be augmented with specially designed test cases tailored to the Unisyn OVS 1.2 for the Functional Configuration Audit (FCA). Wyle has designed specific election definitions for the Operational Status Check and Accuracy Tests.

1.4.1.3 Test Procedure Development and Validation

Wyle will utilize the Wyle Operating Procedures (WoPs) during the duration of this test program. The validated WoPs have been previously submitted to the EAC for review.

1.4.1.4 Third-Party Testing

Wyle will not utilize any 3rd party testing during performance of the Unisyn OVS 1.2 System test campaign.

1.4.1.5 EAC and Manufacturer Dependencies

This information is contained in a Wyle generated Microsoft Project schedule. This schedule is presented in Appendix A "Unisyn Project Schedule."

1.5 Target of Evaluation Description

The following sections address the design methodology and product description of the OVS 1.2 System, as taken from the Unisyn technical documentation.

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1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.1 System Overview

The Unisyn OVS 1.2 System is a paper ballot voting system using touch screen and scan technology to scan and validate ballots, provide voter assisted ballots to accommodate voters with special needs, and tabulate results. OVS consists of the OpenElect Central Suite (OCS), OpenElect Voting Optical (OVO), OpenElect Voting Interface (OVI), and Open Elect Voting Central Scan (OVCS).

Election Management System: OpenElect Central Suite (OCS)

The Unisyn OVS, Version 1.2 OCS consists of ten components running as either a front-end/client application or as a back-end/server application. Below is a list and brief description of each.

- OCS Installer – Facilitates installation of OCS applications onto computers
- Ballot Layout Manager – Provides tools for designing and developing elections and ballots
- Election Manager – Sets election options, adds sounds to an election, exports completed elections, and uploads machine logs
- Election Server – Sets the correct system time and loads elections onto OVO and OVI machines
- Software Server – Updates and validates software on OVO and OVI machines
- Tabulator (Monitor) – Aggregates election results tabulated by OVO and OVCS machines
- Tabulator Reports –Produces election reports from tabulated election data
- Tabulator Client –Imports tabulated election data from OVO units using Transport Media
- Adjudicator – Allows a jurisdiction to evaluate ballots with questionable markings and change them if needed, in accordance with the perceived intent of the voter
- OpenElect Voting Central Scan – Application used for high speed scanning of ballots

Precinct Ballot Tabulator: OpenElect Voting Optical (OVO)

The OVO device is a precinct-level, optical scan, ballot counter (tabulator) designed to perform the following major functions**:**

- Ballot scanning
- Tabulation
- Second chance voting

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1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.1 System Overview (Continued)

Precinct Ballot Tabulator: OpenElect Voting Optical (OVO)

The Unisyn OpenElect Voting Optical (OVO) is a full-page, dual-sided optical scan ballot system which scans and validates voter ballots, and provides a summary of all ballots cast. The election is loaded from the OVS Election Server over a secure local network or via a USB thumb drive. On Election Day, an OVO at each polling location scans and validates voters' ballots, and provides precinct tabulation and reporting. The OVO unit is also paired with the OVI for early voting to scan and tabulate early voting ballots. OVO units can also be used at election headquarters to read absentee, provisional or recount ballots in smaller jurisdictions.

Photograph No. 1
OVO on Plastic Ballot Box

Photograph No. 2
OVO on Portable Ballot Box

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1.0 INTRODUCTION (Continued)

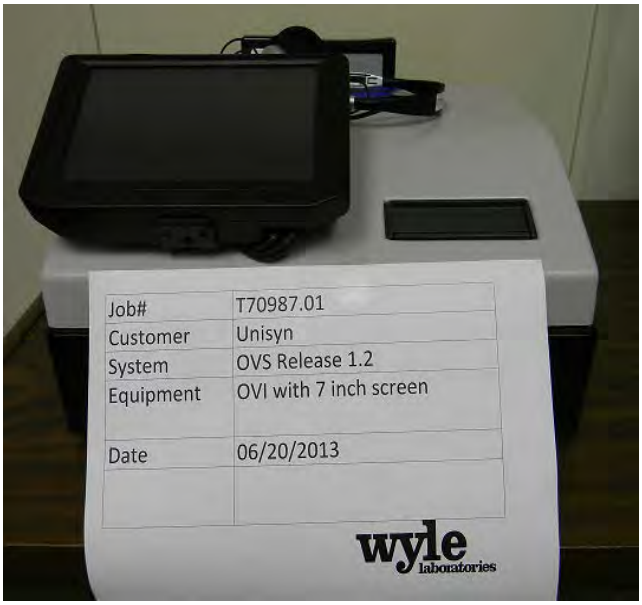
1.5 Target of Evaluation Description (Continued)

1.5.1 System Overview (Continued)

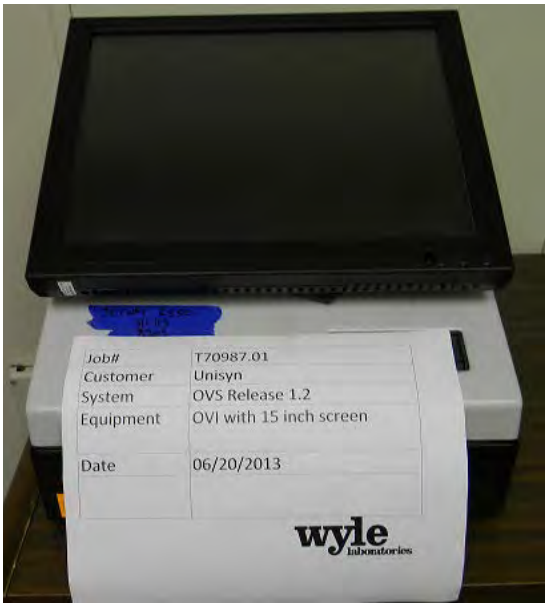
Precinct Voting Device: OpenElect Voting Interface (OVI-7 and OVI-VC)

The OVI is a ballot marking device that supports both ADA and Regional Early Voting requirements. The OVI is a small, innovative Ballot Marking Device solution that enables voters during early voting to cast regional ballots and voters with special needs to prepare their ballots independently and privately. The OVI unit features a 7 inch or 15-inch full color touch screen display that is easy to read making voting simple and error free. The OVI presents each contest on the correct ballot to the voter in visual and (optionally) audio formats. The voter with limited vision navigates through the ballot using the audio ballot and the ADA keypad or touchscreen input to make their selections. The voter validates his/her selections by listening to the audio summary, printing the ballot and inserting it into the OVO.

The OVI facilitates special needs voters through a variety of methods including wheelchair access, sip-n-puff, zoom-in ballot function and audio assistance for the visually impaired. The OVI provides for write-in candidates when authorized. Voters input candidates' names via the ADA keypad, touchscreen or Sip & Puff device. Each OVI can support multiple languages for both visual and audio ballots, allowing the voter to choose their preferred language.



Photograph No. 3
OVI-7



Photograph No. 4
OVI-VC

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1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

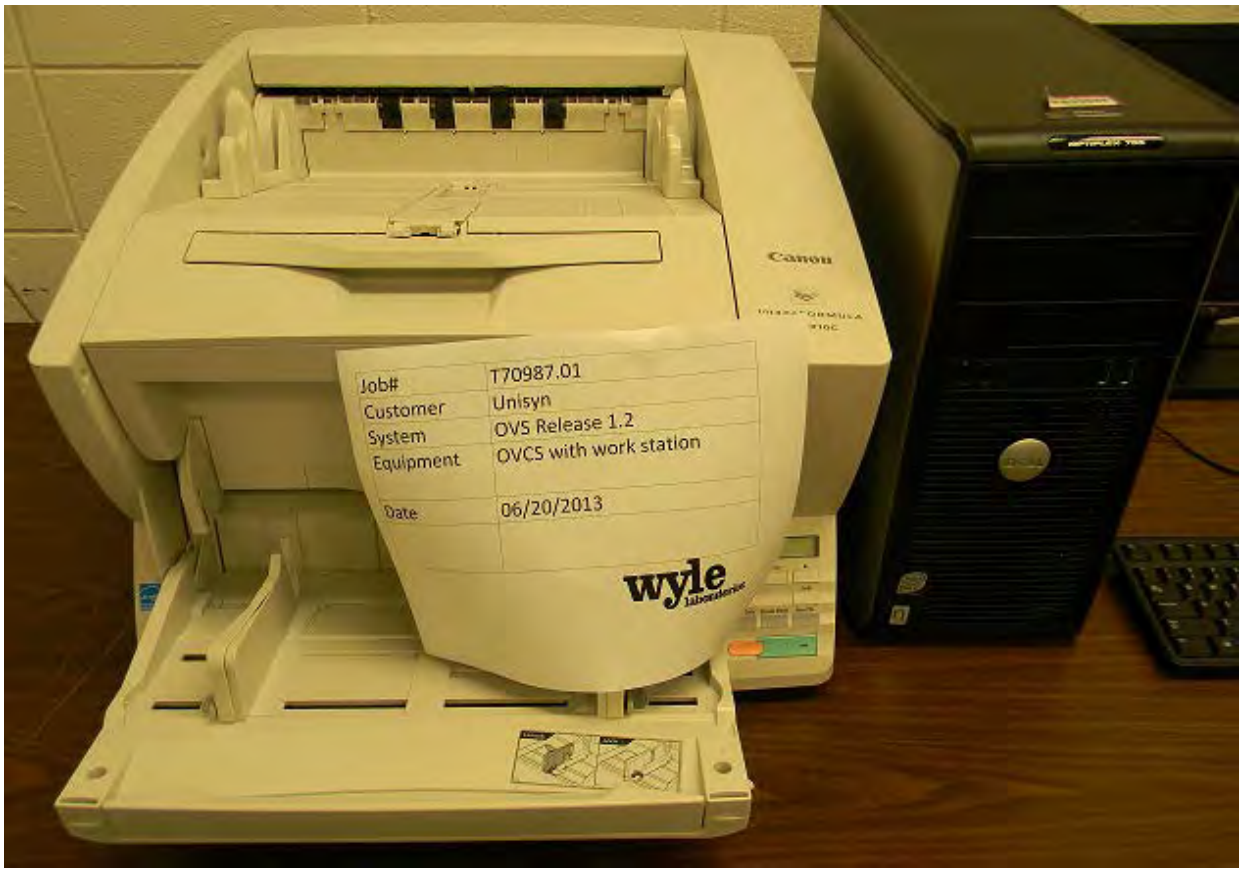
1.5.1 System Overview (Continued)

Central Tabulator: OpenElect Voting Central Scanner (OVCS)

The Unisyn OpenElect Voting Central Scanner (OVCS) resides at election headquarters designated to read absentee, provisional or recount ballots in large jurisdictions or read the entire election's ballots at a central count location in smaller jurisdictions. The OVCS also captures Write-In data images and produces a Write-In image report for manual processing upon request. The OVCS system consists of the following components:

- OVCS Workstation: a COTS computer used for ballot image and election rules processing and results transfer to the EMS.

- Canon DR-X10C Scanner: a COTS scanner used to provide ballot scanning and image transfers to the local OVCS Workstation.



Photograph No. 5
Canon DR-X10C Scanner and OVCS Workstation

1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.2 Block Diagram

The entire system diagram is presented in Figure 1-1.

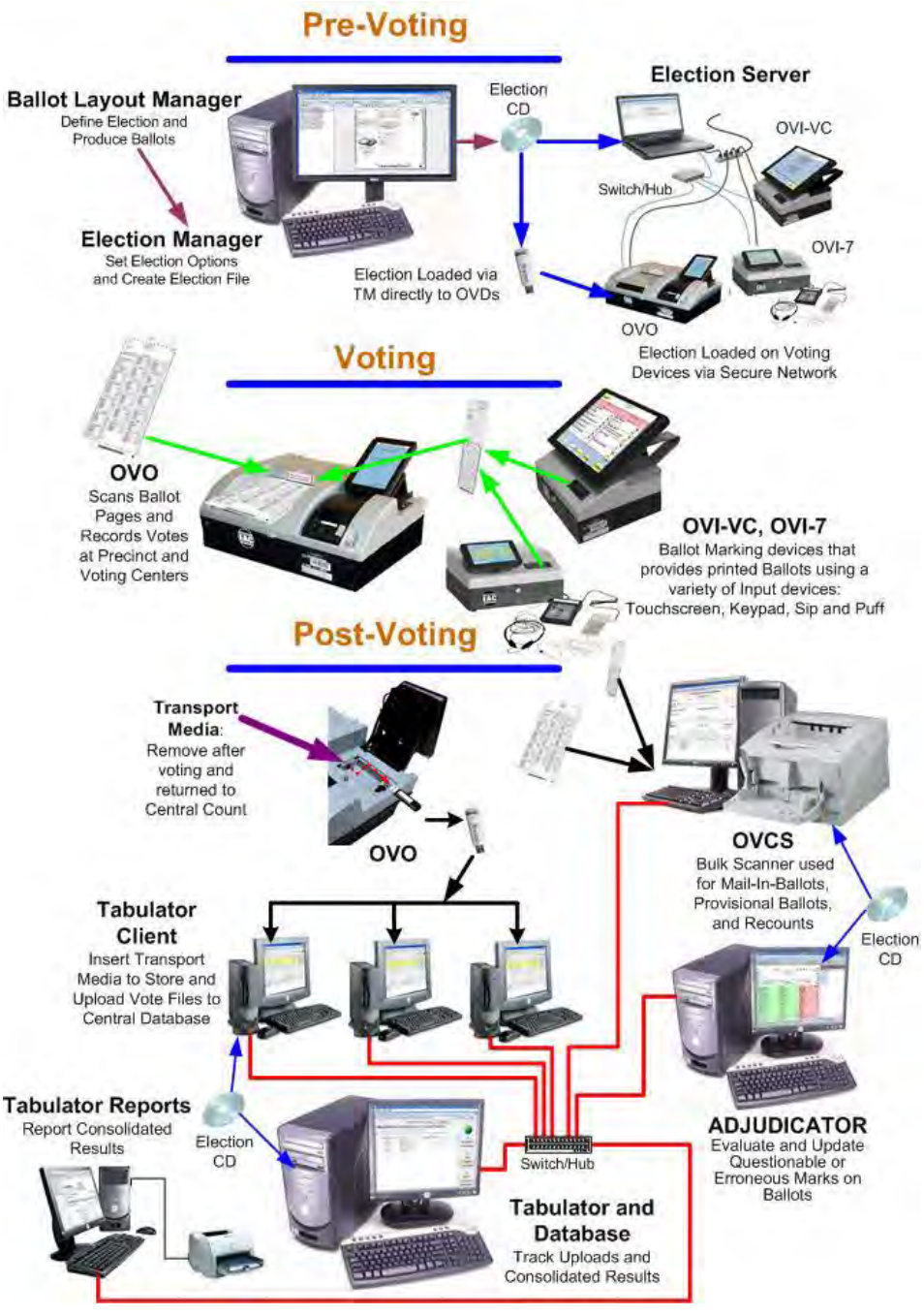


Figure 1-1 System Overview Diagram

1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.3 System Limits

The system limits that Unisyn has stated to be supported by the OVS 1.2 are compiled in the Tables 1-2 and 1-3.

Table 1-2 OVS 1.2 System Limits

Limit (Max # of)	Value
Elections	8
Precincts	2000
Splits per Precinct	9
Districts	400
Contest per District	20
Parties	24
Parties in Primary	12
Parties w/ Straight Ticket	12
District types	25
Languages	15
Ballot styles per Election	400
Contests per Election	150
Measures per Election	30
Instruction Blocks per Election	5
Headers per Election	50
Candidates per Contest	120
Ballot Pages	3
Vote for N of M	25
Ballots sheets per OVO	5000
Units simultaneously loading	20
Precincts initialized per OVO on Election Day	30
Precincts initialized per OVI-7/OVI-VC on Election Day	2000
Precincts initialized per OVO/OVI-7/OVI-VC in early voting	2000

Table 1-3 Unisyn OVS 1.2 Ballot Target Limits

Ballot Length	Maximum Positions (Row x Column)
11 inch	38 x 3
14 inch	50 x 3
17 inch	62 x 3
19 inch	70 x 3

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1.5 Target of Evaluation Description (Continued)

1.5.4 Supported Languages

The following languages have been stated by Unisyn to be supported by the OVS 1.2:

- Armenian
- Cambodian
- Chinese (2 dialects supported)
  - Cantonese
  - Mandarin
- English
- Japanese
- Korean
- Russian
- Spanish
- Tagalog
- Vietnamese

Note: All stated languages will be verified to be supported; however, only English and Spanish ballots will be cast during functional testing. Wyle will test English, Spanish, and one character based language (Chinese) during System Integration Testing. Wyle will not be testing the accuracy of the translation of English to Spanish or English to Chinese.

1.5.5 Supported Functionality

The OVS 1.2 is designed to support the following voting variations:

- General Elections
- Closed primaries
- Early Voting
- Primary presidential delegation nominations
- Partisan offices
- Non-partisan offices
- Write-in voting
- Straight ticket voting
- Presidential-only voting
- Ballot rotation
- Split precincts
- Multi-page ballots

1.0 INTRODUCTION (Continued)

1.5 Target of Evaluation Description (Continued)

1.5.5 Supported Functionality (Continued)

- Multiple selection contests: vote for N of M
- Procedures for and tabulation of Provisional or challenged ballots
- Procedures for and tabulation of Absentee ballots
- Recount tabulation
- Ranked Choice Voting (RCV)
- Vote by Ballot Style

1.5.6 VVSG

The OVS 1.2 will be tested to all applicable EAC 2005 VVSG requirements.

1.5.7 Beyond VVSG

Based on the scope of this modification, no additional test results have been submitted for consideration as part of this test campaign.

2.0 PRE-CERTIFICATION TESTING AND ISSUES

Currently, no pre-certification testing has been completed. Per EAC Notice of Clarification (NOC) 09-001, Wyle views the Certification Test Plan as a living document. It will be updated with "As Run" testing and resubmitted to the EAC as major areas of testing have been completed.

Wyle has performed the first pass review for all source code submitted by Unisyn for OVS Release 1.2 voting system. The issues with compliance to the EAC 2005 VVSG were reported back to the manufacturer for resolution. Subsequent submissions will be reviewed by comparing the new submission against the last submission to ensure all documented issues are resolved before the source code review is completed.

An initial Technical Data Package (TDP) review was performed on the Unisyn OVS Release 1.2 voting system documents submitted as their TDP to determine compliance with the EAC 2005 VVSG and EAC requirements. Wyle found some documents were missing or included partial information, and the existing documentation contained information which was not consistent throughout the Unisyn TDP. The results were reported to Unisyn for resolution. Unisyn has subsequently revised and resubmitted the TDP. Wyle is performing a review of these documents and will submit the results to Unisyn as documented in Section 4.6 TDP Evaluation. Any incidences of non-certification issues (editing issues such as spelling or formatting) will be noted to Unisyn as informational comments for them to decide whether to address them.

2.1 Evaluation of Prior VSTL Testing

Wyle will reutilize all previous testing from the approved Wyle Laboratories previously performed testing to the EAC 2005 VVSG during the OVS 1.0, 1.0.1, and 1.1 approved certification testing (EAC CERTIFICATION NUMBERS – UNS10121966-OE, UNS10121966-OE-WI, and UNS10121966-OE-1.1). A breakdown of this information is provided in the Tables 4-2 and 4-3 located in Section 4.4.1.

2.0 PRE-CERTIFICATION TESTING AND ISSUES (Continued)

2.2 Known Field Issues

This system is a modification to previously certified systems. There were no systemic or significant issues traceable to any of the previously certified systems.

3.0 MATERIALS REQUIRED FOR TESTING

The materials required for certification testing of the OVS 1.2 voting system include software, hardware, test materials, and deliverable materials to enable the test campaign to occur will be delivered by Unisyn to Wyle Laboratories.

3.1 Software

Table 3-1 lists the software the manufacturer must submit for testing. This section lists all software required for operation and testing of the voting system being certified. This includes the software used for testing security and system integration; as well as supporting software required for the test environment including compilers, assemblers, and database managers, etc. Both COTS and non-COTS software components are listed in this section.

Table 3-1 OCS Software Submitted for Testing

Software Required For Testing	Software Version
Proprietary Software	
Adjudicator	1.2.0
Ballot Layout Manager	1.2.0
Common (Library)	1.2.0
Election Manager	1.2.0
Election Server	1.2.0
OCS Installer	1.2.0
Regkey Builder	1.2.0
Software Server	1.2.0
Tabulator	1.2.0
Tabulator Client	1.2.0
Tabulator Reports	1.2.0
OVCS Application	1.2.0
OVI Firmware	1.2.0
OVO Firmware	1.2.0
Scripter	1.2.0
Validator	1.2.0
Logger (Library)	1.2.0

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

The OCS and OVCS software relies on the third party (COTS) software applications listed in Table 3-2.

Table 3-2 OCS and OVCS COTS Software Descriptions

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Java SE Development Kit	Development Kit 6 Update 2 for Linux	jdk-6u2-linux-i586.bin	6a488cb0a161a1c3a541a66e3b076f8e
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73a5ed204bca01e7a
PDI Scanner Driver and Libraries for OVCS	2.1.3	PS3_Canon_libraries_2013Oct07A.zip	da0d643d9f5d4129c5fba2709ffb6d2f

Table 3-3 lists the COTS Operating Systems used in the Unisyn OVS Build Environments as well as the Operating Systems used for the Unisyn OCS and OVCS Applications.

Table 3-3 COTS Operating System Software Descriptions

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Linux CentOS Distribution for OVS 1.2 (used for the OVO/OVI-7 with old motherboard)	5.0	CentOS-5.0-i386-bin-1of6.iso CentOS-5.0-i386-bin-2of6.iso CentOS-5.0-i386-bin-3of6.iso CentOS-5.0-i386-bin-4of6.iso CentOS-5.0-i386-bin-5of6.iso CentOS-5.0-i386-bin-6of6.iso	f749d7e17fa01604b9956304efba2333; 963258ceafda5c5e6f79be86028b6b3d; a08ec9ccfdc89c24f3d6567219f90c42; b31c239009b780d1c89c311c192e43be; 0c3990be2271bf44c1495aa0003b5552; 9e6f91a5292f46b02777133765fc03fe
Linux CentOS Distribution (used for the OCS and OVCS)	5.7	CentOS-5.7-i386-bin-DVD-1of2.iso	**SHA-1:** 053e5bae5b4e23d6a9f5395acd483ef24 2369296a51430db10da9096243d78a7
Linux CentOS Distribution (used for the OVI-VC with new motherboard)	6.3	CentOS-6.3-i386-bin-DVD1.iso	0285160d8ba3cfc720ea55e98e464eac

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

The OVO includes the third-party (COTS) software listed in Table 3-4.

Table 3-4 OVO Third-Party Software (COTS) Descriptions

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Common Files			
Java SE Runtime Environment	Runtime Environment 6 Update 2	jre-6u2-linux-i586.bin	0d30636b5cd23e161da5eda9409f02d5
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73a5ed204bca01e7a
Apache Tomcat	6.0.13	apache-tomcat-6.0.13.tar.gz	50442a96332f0ec0cc1fba354f733ad6
PDI Scanner Driver and Libraries for OVO	6.3.32	PS3_Canon_libraries_2013Oct07A.zip	da0d643d9f5d4129c5fba2709ffb6d2f
Citizen Printer for OVO	1.11.2.7	CSA_JPOS11127_setupEN.bin	d150d08693bf7dbe758adfdab94f655d
Jetway J7F2			
openChrome Video Driver	0.2.900-7.el5	xf86-video-openchrome-0.2.900.tar.gz	3e36895eb4b4d61e21aa27d370f151c8
eGalax Touchscreen Driver	3.00.3719	eGalaxTouch-3.00.3719-32b-k26.tar.gz	51c835408093ccfc4055a9eab9537998
FVWM Desktop Window Manager	2.4.19	fvwm-2.4.19.tar.gz	a2fd2c07061303883d6bf89eb2b259ff

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

The OVI includes the third-party (COTS) software listed in Table 3-5.

Table 3-5 OVI Third-Party Software (COTS) Descriptions

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Common Files			
Java SE Development Kit	Development Kit 6 Update 2 for Linux	jdk-6u2-linux-i586.bin	6a488cb0a161a1c3a541a66e3b076f8e
Java SE Runtime Environment	Runtime Environment 6 Update 2	jre-6u2-linux-i586.bin	0d30636b5cd23e161da5eda9409f02d5
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73a5ed204bca01e7a
RXTX - Library and Jar	2.1-7r2	rxtx-2.1-7-bins-r2.zip	5f21ae633602a24fd3cdd096951476c2
Jetway J7F2			
openChrome Video Driver	0.2.900-7.el5	xf86-video-openchrome-0.2.900.tar.gz	3e36895eb4b4d61e21aa27d370f151c8
eGalax Touchscreen Driver	3.00.3719	eGalaxTouch-3.00.3719-32b-k26.tar.gz	51c835408093ccfc4055a9eab9537998
FVWM Desktop Window Manager	2.4.19	fvwm-2.4.19.tar.gz	a2fd2c07061303883d6bf89eb2b259ff
Jetway 2550			
Xenarc Touchscreen Driver	2.5.2107	eGTouch_v2.5.2107.L-x.tar.gz	cfb148b3997257ed0e4a8eb3fa6b3932
Linux Kernel	3.4.13	linux-3.4.13.tar.bz2	9c850d00c898ba792f29eb6a5973961c

The Linux Build Machine includes the third-party (COTS) software listed in Table 3-6.

Table 3-6 Linux Build Machine Third-Party (COTS) Software Descriptions

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Java SE Development Kit	Development Kit 6 Update 2 for Linux	jdk-6u2-linux-i586.bin	6a488cb0a161a1c3a541a66e3b076f8e
Java 2 Enterprise Edition	1.3.01	j2sdkee-1_3_01-linux.tar.gz	224e9687c73ba48f1186e434368ec9b3
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	b20f9d6ed14e55d73a5ed204bca01e7a
Apache Ant	1.7.0	apache-ant-1.7.0-bin.zip	ac30ce5b07b0018d65203fbc680968f5
Jasper Reports	2.0.5	jasperreports-2.0.5-project.zip	b80bd29e4f95f18bd15da65cfd45d1d2
SQL Connector	5.1.7	mysql-connnector-java-5.1.7.zip	f9a8008367f5b25bdec045c54100d5b0
Apache Axis	1.4	axis-bin-1_4.zip	9eda42bf82a274349f18c5affdd93608
Apache Commons Codec	1.3	commons-codec-current.zip	c30c769e07339390862907504ff4b300
Apache Commons Http	3.0	commons-httpclient-3.0.zip	42d96b0c7d627a2170fd57280476c8fe
Apache Commons File Upload	1.2	commons-fileupload-1.2-bin.zip	6fbe6112ebb87a9087da8ca1f8d8fd6a

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.1 Software (Continued)

Table 3-6 Linux Build Machine Third-Party (COTS) Software Descriptions (Continued)

Software Required For Testing	Software Version	Filename	Hash Value (MD5)
Apache Commons IO	1.3.2	commons-io-1.3.2-bin.zip	ba31cc4a0d85842e4b0bfdf2472382ba
Apache Tag Library	1.1.2	jakarta-taglibs-standard-current.zip	f75c964f1b276b022c24a677ccc17d4d
PDF Help	4.92b23	pdfhelp.jar	f2542f332e5be4549a48f876d63ac915
Javazoom MP3	1.9.4	mp3spi1.9.4.zip	e259e7674d9b19e76f005cee2810e7f5
Citizen Printer for OVO	1.11.2.7	CSA_JPOS11127_setupEN.bin	d150d08693bf7dbe758adfdab94f655d
PDI Scanner Driver and Libraries for OVO and OVCS	2.1.3, 6.3.32	PS3_Canon_libraries_ 2013Oct07A.zip	da0d643d9f5d4129c5fba2709ffb6d2f
RXTX - Library and Jar	2.1-7r2	rxtx-2.1-7-bins-r2.zip	5f21ae633602a24fd3cdd096951476c2
PDI Tool For Verification of Binary File	1.0	VisionX_11202008.EXE	af8905f015c7d7ff730b9f8b0811134b
Fonts for OCS	None	arial.ttf; ARIALBD.ttf; arialbi.ttf; ariali.ttf	124a965ffc59a680c2c20c69c2984032; 579b22c15b24dde38e737ce69ba4e993; a8370703cb6d5424597f6a4651822726; b94c4d211e303045e15c8938d869bf61
Star 700II Printer	1.4.2_11-b06	starjavapos_linux_20070317.zip	172b1fcfecae654b00463be74efc7fbb

3.2 Equipment

This subsection categorizes the equipment the manufacturer has submitted for testing. Each test element is included in the list of the equipment required for testing of that element, including system hardware, general purpose data processing and communications equipment, and any required test instrumentation.

Every effort is made to verify that the COTS equipment has not been modified for use. Wyle will perform research using the COTS equipment manufacturers' websites based on the serial and service tag numbers for each piece of equipment and will evaluate COTS hardware, system software and communications components for proven performance in commercial applications other than elections. For PCs, laptops, and servers, the service tag information is compared to the system information found on each machine. Physical external and internal examination is also performed to the best of Wyle Laboratories' abilities when the equipment is easily accessible without the possibility of damage. Hard drives, RAM memory, and other components are examined to verify that the components match the information found on the COTS equipment manufacturers' websites.

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

Table 3-7 OVO Equipment

Equipment	Manufacturer	Model	Serial Number
OVO	Unisyn	OpenElect Voting Optical	UNI000037
OVO	Unisyn	OpenElect Voting Optical	UNI000049
OVO	Unisyn	OpenElect Voting Optical	UNI000029
OVO	Unisyn	OpenElect Voting Optical	UNI000036
OVO	Unisyn	OpenElect Voting Optical	UNI000039
OVO	Unisyn	OpenElect Voting Optical	UNI000044
OVO Ballot Box	Unisyn	Plastic	BB-58650-001
OVO Ballot Box	Unisyn	Plastic	T70987-BB01
OVO Ballot Box	Unisyn	Portable	T70987-CBB001

Table 3-8 OVI Equipment

Equipment	Manufacturer	Model	Serial Number
OVI-7	Unisyn	OpenElect Voting Interface	UNI150010
OVI-7	Unisyn	OpenElect Voting Interface	UNI150037
OVI-7	Unisyn	OpenElect Voting Interface	UNI150049
OVI-VC	Unisyn	OVI-VC	UNI150012
OVI-VC	Unisyn	OVI-VC	UNI203030
OVI-VC	Unisyn	OVI-VC	UNI203050
OVI-VC	Unisyn	OVI-VC	UNI203066

Table 3-9 OVCS Equipment

Equipment	Manufacturer	Model	Serial Number
OVCS	Canon	ImageFORMULA DR-X10C	ED300631

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

Table 3-10 OCS COTS Equipment

Equipment	Manufacturer / Model	Hardware Specifications	Service Tag	Software Configuration
PC 1	Dell Precision T3600	Processor: Intel Xeon E5-1620 3.6GHz Memory:4x 4GB 1600Mhz RAM Hard Drive Capacity: 500GB (Mirrored)	CP7GGX1	OVCS/ All OCS applications
PC 2	Dell Optiplex 7010	Processor: Intel Core i7-3770 3.4GHz Memory: 4x 4GB 1600Mhz RAM Hard Drive Capacity: 500GB	2Y7BGX1	All OCS applications
PC 3	HP 2000 Notebook PC	Processor: AMD Dual-Core E1-1500 1.48GHz Memory: 1x 4GB DDR3 SDRAM Hard Drive Capacity: 320GB	2c32NR	All OCS applications

Table 3-11 OVS 1.2 COTS Equipment

COTS Equipment	Make	Model	Serial Number
Headphones	Koss	KPH5	T70987-HP-001
Headphones	Koss	KPH5	T70987-HP-002
Headphones	Koss	KPH5	HP-T58650-002
Sip & Puff	Origin Instruments	AirVoter	00594
UPS	Minuteman	Entrust Series ETR1500	AE580906PA106
UPS	Minuteman	Entrust Series ETR1500	AE580906PA114
UPS	Minuteman	Entrust Series ETR1500	AE58090500284
UPS	Minuteman	Entrust Series ETR1500	AE58090500278
20 x Transport Media	STEC	Thumb Drive (UFD) 1GB Capacity	TM001-TM0020
3 x Thumb Drives	PNY	USB 16 GB	PNY1, PNY2
Network Switch	Linksys	SR2024 Business Series 24-Port 10/100/1000 Gigabit Switch	REM30H600558 GGR1807 JJ
Dot Matrix Printer	Okidata	Microline 186	AK27043919B0
External DVD-RW Drive	Pioneer	DVR-X162Q	IDFW002121UC
External DVD-RW Drive	Samsung	SE-S084	R8816GAZA19986

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

Table 3-12 OVS 1.2 Build Equipment

Equipment and Operating System	Manufacturer	Version/Model	Serial Number	COTS /Non-COTS
Application Build Machine – CentOS Linux 6.3	Jetway	Processor: VIA Nano-BGA 1.5GHz Memory: 1GB Hard Drive Capacity: 320GB	T70987-SBM-001	COTS
OVI Linux OS Build Machine – CentOS Linux 6.3	Jetway	Processor: VIA Nano-BGA 1.5GHz Memory: 1GB Hard Drive Capacity: 320GB	T70987-SBM-003	COTS
Extra Hard Drives x 2	Western Digital	WD3200AAJA	N/A	COTS

3.3 Test Support Materials

This subsection enumerates any and all test materials needed to perform voting system testing. The scope of testing determines the quantity of a specific material required.

Table 3-13 Test Support Materials

Test Material	Quantity	Make	Model
50 CD-R Spindle	1	Memorex	TBD
25 DVD-R Spindle	1	Memorex	TBD
Box of Dot matrix printer paper	1	N/A	Printer paper
Box of OVI Paper Rolls	1	N/A	OVI Printer Paper
Box of OVO Paper Rolls	3	N/A	OVO Printer Paper
Security zip ties	1 bag	TBD	TBD
Security seals	1 bag	TBD	TBD

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.4 Deliverable Materials

The materials listed in Table 3-14 are to be delivered as part of the OVS 1.2 voting system to the users:

Table 3-14 Deliverable Materials

Deliverable Material	Version	Description
OCS	1.2	EMS software suite
OVO	1.2	Precinct ballot scanner
OVI-7 (7" screen)	1.2	Ballot Marking Device Early voting station Accessible voting station
OVI-VC (15" screen)	1.2	Ballot Marking Device Early voting station Accessible voting station
OVCS	1.2	Central Count scanner
Ballot Box – Plastic	1.1	OVO plastic ballot receptacle
Ballot Box – Portable	1.2	OVO portable ballot receptacle
Transport media	STEC 1 GB	USB Flash Drive
Minuteman UPS	ETR1500	UPS
Headphones (optional)	Koss KPH5	Stereo headphones
Sip and Puff (optional)	AirVoter	Binary input device
04-00444 OVS System Functionality	1.1	TDP Document
04-00446 System Overview	1.4	TDP Document
04-00459 System Maintenance Procedures	1.1	TDP Document
04-00454 Quality Assurance Plan	1.0	TDP Document
04-00494 OVS Acronyms	1.2	TDP Document
04-00428 Ballot Layout Manager User Guide	1.3	TDP Document
04-00427 Election Manager User Guide	1.1	TDP Document
04-00429 Election Server User Guide	1.0	TDP Document
04-00430 Software Server User Guide	1.0	TDP Document
04-00431 Tabulator Client User Guide	1.0	TDP Document
04-00432 Tabulator User Guide	1.1	TDP Document
04-00433 Tabulator Reports User Guide	1.1	TDP Document
04-00495 OVCS User Guide	1.0	TDP Document
04-00448 OVS Configuration Management Plan	1.3	TDP Document
04-00460 OVS System Operations Guide Warehouse Technician's Guide	1.2	TDP Document
04-00462 OVS System Operations Guide EDay Troubleshooters	1.2	TDP Document
04-00463 OVS System Operations Guide EDay Pollworkers	1.4	TDP Document
04-00464 Software Design and Specification	1.7	TDP Document
04-00503 OVS Paper Specification	1.0	TDP Document
04-00513 System HW Verification	1.1	TDP Document
04-00530 Adjudicator User Guide	1.0	TDP Document

4.0 TEST SPECIFICATIONS

Modification testing of the OVS 1.2 is the configuration submitted in the EAC application UNS1301. Wyle Laboratories' qualified personnel will ensure that all certification testing performed on the manufacturer's voting system follows Wyle Laboratories' procedures for testing and the specific test cases to ensure the requirements of the EAC 2005 VVSG and EAC Testing and Certification Program Manual are met.

Below is a list of EAC Request for Interpretations (RFI) and Notice of Clarifications (NOC) that will be incorporated in the test campaign:

Request for Interpretations (RFI)

RFI 2013-02 EAC Decision on Audio Presentation Volume Levels

RFI 2013-01 EAC Decision on the Extensions Clause

RFI 2012-06 EAC Decision on Use of Public Telecommunications Networks and Data Transmission

RFI 2012-05 EAC Decision on Public Telecommunications and Cryptography

RFI 2012-04 EAC Decision on Software Setup Validation

RFI 2012-03 EAC Decision on Configuration of COTS Products

RFI 2012-02 EAC Decision on Transmission of Results (Official and Unofficial Results)

RFI 2012-01 EAC Decision on Ballot Handling – Multi-feed

RFI 2010-08 EAC Decision on Calling Sequence

RFI 2010-07 EAC Decision on Module Length

RFI 2010-06 EAC Decision on DRE Accessibility Requirements and Other Accessible Voting stations

RFI 2010-05 EAC Decision on Testing of Modifications to a Certified System

RFI 2010-04 EAC Decision on Functional Requirements with Respect to Security

RFI 2010-03 EAC Decision on Database Coding Conventions

RFI 2010-01 EAC Decision on Voltage Levels and ESD Test

RFI 2009-06 EAC Decision on Temperature and Power Variation

RFI 2009-05 EAC Decision on T-Coil Requirements

RFI 2009-04 EAC Decision on Audit Log Events

RFI 2009-03 EAC Decision on Battery Backup for Central Count Systems

RFI 2009-02 EAC Decision on Alternate Languages

RFI 2009-01 EAC Decision on VVPAT Accessibility New

RFI 2008-12 EAC Decision on Ballot Marking Device/Scope of Testing

RFI 2008-10 EAC Decision on Electrical Fast Transient

RFI 2008-09 EAC Decision on Safety Testing

RFI 2008-08 EAC Decision on Automatic Bar Code Readers

RFI 2008-07 EAC Decision on Zero Count to Start Election

RFI 2008-06 EAC Decision on Battery Backup for Central Count

RFI 2008-05 EAC Decision on Durability

4.0 TEST SPECIFICATIONS (Continued)

RFI 2008-04 EAC Decision on Supported Languages

RFI 2008-03 EAC Decision on OS Configuration

RFI 2008-02 EAC Decision on Battery Backup for Optical Scan Voting Machines

RFI 2008-01 EAC Decision on Temperature and Power Variation

RFI 2007-06 EAC Decision on Recording and Reporting Undervotes

RFI 2007-05 EAC Decision on Testing Focus and Applicability

RFI 2007-04 EAC Decision on Presentation of Alternative Language

RFI 2007-03 EAC Decision on Summative Usability Testing

RFI 2007-02 EAC Decision on Variable Names

RFI 2007-01 EAC Decision on Accessible Design

Notice of Clarifications (NOC)

NOC 2012-02 Clarification of System Identification Tool Functionality

NOC 2012-01 Clarification of COTS Product Equivalency for De Minimis Change

NOC 2011-01 Clarification of De Minimis Change Determination Requirements Related to Data

NOC 2009-005 Development and Submission of Test Plans for Modifications to EAC Certified Systems

NOC 2009-004 Development and Submission of Test Reports

NOC 2009-003 De Minimis Change Determination Requirement

NOC 2009-002 Laboratory Independence Requirement

NOC 2009-001 Requirements for Test Lab Development and Submission of Test Plans

NOC 2008-003 EAC Conformance Testing Requirements

NOC 2008-002 EAC Mark of Certification

NOC 2008-001 Validity of Prior Non-core Hardware Environmental and EMC Testing

NOC 2007-005 Voting System Test Laboratory Responsibilities in the Management and Oversight of Third Party Testing

NOC 2007-004 Voting System Manufacturing Facilities

NOC 2007-003 State Testing Done in Conjunction with Federal Testing within the EAC Program

NOC 2007-002 VSTL Work with Manufacturers Outside of Voting System Certification Engagements

NOC 2007-001 Timely Submission of Certification Application

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4.0 TEST SPECIFICATIONS (Continued)

4.1 Requirements (Strategy of Evaluation)

To evaluate the system test requirements, each section of the EAC 2005 VVSG will be analyzed to determine the applicable tests. The EAC 2005 VVSG Volume I sections, along with the strategy for evaluation, are described below:

- **Section 2: Functional Requirements** – The requirements in this section will be tested during the FCA and System Integration test utilizing the "Wyle Baseline Test Cases" along with test cases specially designed for the Unisyn OVS 1.2 per sections 4.4.3 and 4.4.4. The data input during these tests will be the predefined election definitions submitted as part of the Test Plan Package.
- **Section 3: Usability and Accessibility** – The requirements in this section will be tested during the Usability Test utilizing a combination of the "Wyle Baseline Test Cases" and the "Wyle Baseline Usability Test Cases." The data input during this test will be the predefined election definitions submitted as part of the Test Plan Package.
- **Section 4: Hardware Requirements** – The requirements in this section will be tested and/or evaluated by trained Wyle personnel per sections 4.4.2 and the table in section 6.
- **Section 5: Software Requirements** – The requirements in this section will be tested during source code review, TDP review, and FCA. A combination of review and functional testing will be performed to ensure these requirements are met.
- **Section 6: Telecommunication** – A test of the telecommunication technologies utilized by the Unisyn OVS 1.2 will be tested for data accuracy and correctness by analyzing the packet level information being transmitted. The telecommunications testing is limited to the closed network used in the Unisyn OVS 1.2 voting system. Section 6.2.6 will be excluded since the OVS 1.2 does not support the use of public networks.
- **Section 7: Security Requirements** – The requirements in this section will be tested during source code review, FCA, System Integration, and Security Tests. The requirements for this section that pertain to security for the use of public telecommunications by the voting system will be excluded. The OVS 1.2 does not support the use of public networks.
- **Section 8: Quality Assurance (QA) Requirements** – The requirements in this section will be tested throughout the test campaign via various methods. TDP review will be performed on the Unisyn QA documentation to determine compliance to EAC 2005 VVSG requirements and the requirements stated in the Unisyn QA Program document. All source code will be checked to ensure that proper QA documentation has been completed. All equipment received for initial testing and follow up testing will be checked against Unisyn documentation to ensure their QA process is being followed. Wyle Laboratories' personnel will complete the requirements of EAC 2005 VVSG Vol. 2 Section 7, Quality Assurance Testing and Section 1.3.1.5, Focus of Vendor Documentation that requires Wyle personnel to physically examine documents at Unisyn's location or conduct an external evaluation utilizing equipment, documents and support information provided by Unisyn during the test campaign.
- **Section 9: Configuration Management (CM) Requirements** – The requirements in this section will be tested throughout the test campaign. TDP review will be performed on the Unisyn configuration management documentation to determine EAC 2005 VVSG compliance and to further determine whether Unisyn is following its documented CM requirements within the TDP. During source code review, Wyle Laboratories' qualified personnel will verify that Unisyn is following EAC 2005 VVSG CM requirements as well as Unisyn CM requirements. Any anomalies will be formally reported to Unisyn and the EAC. All equipment received for testing will be checked against Unisyn documentation to ensure their CM process is being followed.

4.0 TEST SPECIFICATIONS (Continued)

4.1 Requirements (Strategy of Evaluation)

Wyle Laboratories' personnel shall maintain a test log of the procedure(s) employed. This log identifies the system and equipment by model and serial number. In the event that the project engineer deems it necessary to deviate from Wyle Test Cases or Wyle Operating Procedures (WoPs) pertaining to the test environment, the equipment arrangement and method of operation, the specified test procedure, or the provision of test instrumentation and facilities, shall be recorded in the test log. (A discussion of the reasons for the deviation and the effect of the deviation on the validity of the test procedure shall also be provided and approved by the Project Engineer and Program Manager.)

Wyle Laboratories utilizes an internal bug tracking system in order to capture and track all issues and discrepancies found during the testing campaign. This allows for all issues and discrepancies to be monitored for reoccurrence, tracks the root cause analysis, and provides a resolution status. Wyle Laboratories shall verify all items logged into the bug tracking system are resolved prior to the completion of testing and before any recommendation may be made for certification.

The designated WoPs for this program are listed below together with the identification and a brief description of the hardware and software to be tested and any special considerations that affect the test design and procedure.

The specific Wyle WoPs to be used during testing include the following:

- WoP 1 Operations Status Checks
- WoP 2 Receipt Inspection
- WoP 3 Technical Data Package Review
- WoP 4 Test Plan Preparation *(This document)*
- WoP 5a-d Source Code Review
- WoP 6a-d Security
- WoP 7 Trusted Build
- WoP 9 Electromagnetic Emissions
- WoP 10 Electrostatic Disruption
- WoP 24 1 – 1g Usability
- WoP 25 Physical Configuration Audit
- WoP 26 Functional Configuration Audit
- WoP 27 Maintainability
- Wop 28 Availability
- Wop 29 Electrical Supply
- WoP 30 System Integration Test
- WoP 31 Telecommunications
- WoP 34 Test Report
- WoP 36 Vote Recording Requirements
- WoP 41 Logic & Accuracy

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4.0 TEST SPECIFICATIONS (Continued)

4.1 Requirements (Strategy of Evaluation)

4.1.1 Rationale for 'Not Applicable' Requirements

The Unisyn OVS 1.2 is a paper-based precinct counting system that supports a closed network (does not support transmission over public networks). Therefore, all EAC 2005 VVSG requirements, with the exceptions listed below, will be evaluated as part of this test campaign.

- Volume I Section 6.2.6 (Telecommunication Requirements)
- Volume I Section 7.5.2 (Protection Against External Threats)
- Volume I Section 7.5.3 (Monitoring and Responding to External Threats)
- Volume I Section 7.5.4 (Shared Operating Environment) Only the OVO and OVI are excluded.
- Volume I Section 7.6 (Use of Public Communication Networks)
- Volume I Section 7.7 (Wireless Communications)
- Volume I Section 7.9 (Voter Verifiable Paper Audit Trail Requirements)

The rationale for not evaluating the OVS 1.2 to the requirements contained in the indicated sections of the EAC 2005 VVSG is described in Table 4-1.

Table 4-1 Not Applicable Requirements

EAC 2005 VVSG Volume I Section	Rationale for 'Not Applicable'
6.2.6, 7.5.2, and 7.5.3	These requirements are written for use of public networks. The Unisyn OVS 1.2 does not use public networks.
7.5.4	This section is intended for a shared operating environment on ballot recording and vote counting equipment. The OVO and OVI use dedicated operating environments and will be excluded from this requirement. The OCS and OVCS components do use a shared operating environment and will be tested to this VVSG requirement.
7.6	This section pertains to "Voting systems that transmit data over public telecommunications…" The Unisyn OVS 1.2 does not support transmission over public networks.
7.7	No wireless technology is present in the Unisyn OVS 1.2.
7.9	The Unisyn OVS 1.2 is a paper based system.

4.2 Hardware Configuration and Design

The Unisyn OVS 1.2 hardware will be tested by the Wyle Laboratories' EMI, Dynamics, and Environmental test departments for testing to the hardware requirements in accordance with Wyle Laboratories A2LA Certification 845.01-.03. All EMI testing will be performed, per the following Wyle Laboratories' Test Guidelines Documents: EMI-001A, "Wyle Laboratories' 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." These proprietary documents shall be submitted under separate cover for reference. All hardware testing will be performed per the guidelines of ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment, General Requirements," and ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment" and the governing MIL-STD to which the test is required. All pre-voting and post-voting tests will be conducted by Wyle Laboratories' qualified personnel at Wyle Laboratories' Huntsville, AL facility.

4.0 TEST SPECIFICATIONS (Continued)

4.2 Hardware Configuration and Design (Continued)

The Unisyn OVS 1.2 voting system is a paper-based optical scan voting system. The OVS 1.2 voting system consists of four major components: the OCS, OVO precinct scanner, OVI precinct voting interface, and OVCS central count scanner. The OVS 1.2 is comprised of two proprietary pieces of hardware (OVO and OVI) and one piece of COTS hardware (OVCS). All OCS functions are handled by proprietary software running on COTS PC/laptops/servers. Wyle has determined that these COTS PC/laptops/servers are not subject to hardware testing per the EAC 2005 VVSG. The provided PC/laptops/servers documented in Section 3, Materials Required for Testing, all contained CE, UL, and FCC labeling.

Each unit will be loaded with the Operational Status Check Hardware election definition configured for early voting. This will allow all the data generated for the Pre-operational, Operational, and Post-operational test to be further analyzed, compiled and included in the Reliability and Availability Test results.

4.3 Software System Functions

The Unisyn OVS 1.2 System software is written in the JAVA programming language. The system software is broken into three areas: EMS, Precinct tabulator/interface software acting as firmware, and central count application running on a COTS workstation.

The OVS 1.2 EMS (OCS) software consists of the eight components listed below:

- Ballot Layout Manager (BLM)
- Election Manager (EM)
- Election Server (ES)
- Tabulator Client (TC)
- Tabulator
- Adjudicator
- Tabulator Reports (TR)
- Software Server (SS)

The OVS 1.2 contains two precinct devices. The software applications are OVO and OVI. The OVS 1.2 has an independent workstation running proprietary software. The OVCS application provides the central tabulation function for the system.

4.4 Test Case Design

Wyle Laboratories uses the V-Model Life Cycle as defined by the Institute of Electrical and Electronics Engineers (IEEE). The IEEE definition of the V-Model Life Cycle uses two concepts “Verification” and “Validation.” Wyle’s test approach is to incorporate the use of both “Verification” and “Validation”. There are four basic levels of testing in the V-Model Life Cycle: Component, Integration, System, and Acceptance. Wyle will be evaluating the Unisyn OVS 1.2 to all four levels.

4.0 TEST SPECIFICATIONS (Continued)

4.4 Test Case Design (Continued)

4.4.1 Hardware Qualitative Examination Design

Preliminary EMI quick scans were performed on the OVO, OVI-7, and OVI-VC components to verify any effects caused by the changes to the unit. Based on the results of the quick scans, Wyle determined that re-test would be necessary for the OVO, OVI, and OVI-VC as noted in table 4-2. During hardware test the OVO and OVI-7 failed to meet the hardware testing requirements. To resolve the hardware issues Unisyn withdrew the new hardware (new mother board and new touchscreen) from the OVO and OVI-7 and reverted to the previously certified hardware.

Wyle Laboratories previously performed testing to the EAC 2005 VVSG during the OVS 1.0, 1.0.1, and 1.1 approved certification testing (EAC CERTIFICATION NUMBERS – UNS10121966-OE, UNS10121966-OE-WI, and UNS10121966-OE-1.1). Wyle Laboratories will be utilizing the data obtained during that test effort to satisfy requirements for this modification test campaign.

The summary of acceptable testing is provided in Tables 4-2 and 4-3. The details of those tests are presented in Section 6.0.

Table 4-2 OVO and OVI Test Examination Results

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Status
Usability/3.1	Measure of the effectiveness, efficiency, and satisfaction achieved by a specified set of users	OVO/OVI-7/ OVI-VC	Accept
Accessibility/3.2	Tests the voting system to ensure accessibility for individuals with disabilities to include, but not limited to visually impaired voters by providing the same access and participation opportunity.	OVO/OVI-7/ OVI-VC	Accept for the OVI-7 & OVI-VC/ Test OVO on the new portable ballot box
Security/7	Tests the ability of the system to detect, prevent, log, and recover from a broad range of security risks identified.	OVO/OVI-7/ OVI-VC	Accept for the OVI-7 & OVI-VC/ Test OVO on the new portable ballot box
Maintainability/4.3.4	Tests the ease in which preventative and corrective maintenance actions can be performed based on design, software, and documentation.	OVO/OVI-7/ OVI-VC	Accept
Availability/4.3.5	Tests the voting system to help ensure the probability that the equipment will be operational and accomplish set functions. This shall be calculated using the following formula at a 99% availability rate: Ai=(MTBF)/(MTBF+MTTR)	OVO/OVI-7/ OVI-VC	Accept
Safety/4.3.8	UL 60950-1 product safety review	OVO/OVI-7/ OVI-VC	Accept
Electrical Supply/4.1.2.4	Meets voltage and power requirements of EAC 2005 VVSG Vol. 1 Section 4.1.2.4	OVO/OVI-7/ OVI-VC	Accept

4.0 TEST SPECIFICATIONS (Continued)

4.4 Test Case Design (Continued)

4.4.1 Hardware Qualitative Examination Design (Continued)

Table 4-2 OVO and OVI Test Examination Results (Continued)

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Status
Electromagnetic Radiation/4.1.2.9	FCC Part 15 Class B for both radiated and conducted emissions	OVO/OVI-7/ OVI-VC	Accept for the OVO & OVI-7/ Retest OVI-VC
Electromagnetic Susceptibility/4.1.2.10	IEC 61000-4-3 electromagnetic field of 10V/m modulated by a 1kHz, 80% AM modulation at 80MHz to 1000MHz frequency	OVO/OVI-7/ OVI-VC	Accept for the OVO & OVI-7/ Retest OVI-VC
Temperature/Power Variation/4.1.2.13	MIL-STD-810D, Method 502.2 and Method 501.2 163 hours at 50 degrees to 95 degrees	OVO/OVI-7/ OVI-VC	Accept
High Temperature/4.1.2.14	MIL-STD-810D, Method 501.2 maximum temperature shall be 140 degrees F	OVO/OVI-7/ OVI-VC	Accept
Low Temperature/4.1.2.14	MIL-STD-810D minimum temperature shall be -4 degrees F	OVO/OVI-7/ OVI-VC	Accept
Bench Handling	MIL-STD-810D, Method 516.3 Procedure VI six 4” drops on each edge totaling 24 drops	OVO/OVI-7/ OVI-VC	Accept
Vibration/4.1.2.14	MIL-STD-810D, Method 514.3 physical shock and vibration during handling and transport	OVO/OVI-7/ OVI-VC	Accept
Humidity Test/4.1.2.14	MIL-STD-810D, Method 501.2 ten 24 hour humidity cycles	OVO/OVI-7/ OVI-VC	Accept
Electrical Power Disturbance/4.1.2.5	IEC 61000-4-11 (1994-06) power surges and dips	OVO/OVI-7/ OVI-VC	Accept
Electrical Fast Transient/4.1.2.6	IEC 61000-4-4 (1995-01)	OVO/OVI-7/ OVI-VC	Accept
Lightning Surge/4.1.2.7	IEC 61000-4-5 (1995-02)	OVO/OVI-7/ OVI-VC	Accept
Electrostatic Disruption/4.1.2.8	IEC 61000-4-2 (1995-01) 15kV air discharge and 8kV contact discharge	OVO/OVI-7/ OVI-VC	Accept for the OVO & OVI-7/ Retest OVI-VC
Conducted RF Immunity/4.1.2.11	IEC 61000-4-6 (1996-04) conducted radio frequency energy	OVO/OVI-7/ OVI-VC	Accept for the OVO & OVI-7/ Retest OVI-VC
Magnetic Fields Immunity/4.1.2.12	IEC 61000-4-8 (1993-06) AC magnetic fields of 30 A/m at 60Hz	OVO/OVI-7/ OVI-VC	Accept for the OVO & OVI-7/ Retest OVI-VC

4.0 TEST SPECIFICATIONS (Continued)

4.4 Test Case Design (Continued)

4.4.1 Hardware Qualitative Examination Design (Continued)

Table 4-3 OVCS Test Examination Results

Test/EAC 2005 VVSG Section	Procedure/Description	Configuration Tested	Status
Maintainability/4.3.4	Tests the ease in which preventative and corrective maintenance actions can be performed based on design, software, and documentation.	OVCS	Accept
Electrical Supply/4.1.2.4	Meets voltage and power requirements of EAC 2005 VVSG Vol. 1 Section 4.1.2.4	OVCS	Accept
Availability/4.3.5	Tests the voting system to help ensure the probability that the equipment will be operational and accomplish set functions. This shall be calculated using the following formula at a 99% availability rate: Ai=(MTBF)/(MTBF+MTTR)	OVCS	Accept

Support Equipment

Wyle has determined that these COTS PC/Laptops and Servers are not subject to the hardware test requirements per the EAC 2005 VVSG per "2007-05 Decision on Testing Focus and Applicability." The provided PC/Laptops documented in Section 3, Materials Required for Testing, all contain CE, UL, and FCC labeling.

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4.0 TEST SPECIFICATIONS (Continued)

4.4 Test Case Design (Continued)

4.4.2 Software Module Test Case Design and Data

Wyle Laboratories implements Component Level Testing during the FCA for each component and subcomponent, exercising the functionality of each as designed and documented. Wyle will utilize limited structural-based techniques (white-box testing) mainly in the area of Source Code Review, Compliance Builds, and Security Testing and Review. Wyle Laboratories will depend heavily on specification-based techniques (black-box testing) for the individual software components.

The most common specification-based techniques applied to the Unisyn OVS 1.2 during the software testing portion of testing will be "equivalence partitioning" and "boundary value testing:"

- "Equivalence partitioning" will be used to evaluate specific software functions and data entry points of the OVS 1.2 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.

Wyle Laboratories will document an expected result for each test. The ACCEPT/REJECT criteria at the Component Level will be based on the expected result. If the System Under Test (SUT) performs as expected, the results will be accepted. If the SUT does not perform as expected, the test will be evaluated for tester error. If it is determined there was no tester error, the test will be repeated in an attempt to reproduce the results. If the results can be reproduced and the expected results are not met, the SUT will have failed the test. If the results cannot be reproduced, the manufacturer and VSTL will determine the root cause of the error. If the root cause has been corrected and the SUT performs as expected, then the results will be accepted. If the root cause cannot be determined, the problem has not been corrected, or the SUT still does not perform as expected, the SUT will have failed the test.

Wyle will document the error and track the error through resolution. Wyle will not move to the next level of testing until all documented errors are resolved to try and minimize errors that might occur farther along in the test campaign. 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.

4.4.3 Software Functional Test Case Design and Data

Wyle implements Integration Level Testing primarily focusing on the interface between components and applications.

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4.0 TEST SPECIFICATIONS (Continued)

4.4 Test Case Design (Continued)

4.4.3 Software Functional Test Case Design and Data (Continued)

The test approach to be used for the Unisyn OVS 1.2 will be a bottom-up approach where the lower-level components will be tested first and then used to facilitate the testing of higher-level components. The specification-based technique used by Wyle Laboratories at the Integration Level is "Use Case." The actors that have been identified to use the Unisyn OVS 1.2 are the following:

- Election Administrator – the actor with responsibility of entering the election definition with translation and audio. This actor is also responsible for maintaining EMS users and the election database.
- Warehouse Technician – the actor responsible for loading the election definition onto the OVO and OVI units. This actor also runs diagnostic tests and maintains the units
- Poll Worker- the actor at the precinct location to set up and close down the OVO and OVI on Election Day.
- Voter – the actor who physically casts the ballot on Election Day.
- ADA Voter – the actor with special needs who has to vote unassisted on Election Day.
- Election Official – the actor who reports and audits the election results post-Election Day.

"Use Case" will be used during the FCA with a single pass through each component using only valid data. This pass will be 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 that will utilize the "Master Copy" of data at the Integration Level are Security, Telecommunication, and Usability. During test performance, if an error occurs between data interfaces or in the process flow, an engineering analysis will be performed to determine if the error is data, process, or tester error.

The ACCEPT/REJECT criteria for Integration Level testing is whether the components and applications interface using the documented process for each actor. If there is an error interfacing between components, the error will be documented and tracked through to resolution. 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.

4.4.4 System-Level Test Case Design

Wyle Laboratories implements System Level testing focusing on a complete system including all proprietary software, proprietary hardware, proprietary peripherals, COTS software, COTS hardware, and COTS peripherals in a configuration of the system's intended use. The Unisyn OVS 1.2 is intended to support both large and small jurisdictions. Wyle Laboratories' approach for Unisyn OVS 1.2 will be to execute System Level Testing with a variety of elections that include various combinations of jurisdictions, parties, and ballot styles.

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4.0 TEST SPECIFICATIONS (Continued)

4.4 Test Case Design (Continued)

4.4.4 System-Level Test Case Design (Continued)

Wyle Laboratories will test the function of all hardware, software, and peripherals of the complete system during System Level Testing. The ACCEPT/REJECT criteria for System Level testing is whether the system can continue in testing.

The two scenarios are: Accept or Reject. Accept is either 1) if no errors are found, or 2) if an error is encountered, but the system continues to operate and engineering analysis determines that the root cause does not affect testing. Reject if the system is too unstable to continue or engineering analysis determines the root cause could affect further testing.

Wyle implements Acceptance Level testing focusing on all the data collected during the entire test campaign along with performing the "Trusted Build" for the system. All data from pre-testing, hardware testing, software testing, functional testing, security testing, telecommunication testing, usability testing, accessibility testing, and reliability testing activities will be combined to ensure all requirements that are supported by the Unisyn OVS 1.2 in the EAC 2005 VVSG have been tested. All requirements will be checked against the test data to ensure the EAC 2005 VVSG requirements are met. Items not supported by Unisyn OVS 1.2 will be documented. Any issues documented during testing will be resolved or annotated in the test report.

Wyle will test every EAC 2005 VVSG requirement supported by the Unisyn OVS 1.2 voting system. Wyle will report all issues discovered during this test campaign to Unisyn and the EAC. If Wyle determines there is not enough data to ensure a requirement was met, the test plan will be altered and further testing will be done. The EAC has the final decision as to whether the system meets all the requirements for an EAC-certified system. Wyle will either recommend approval, if the system meets all applicable sections of the VVSG or recommend disapproval if the system does not meet all applicable sections of the VVSG.

4.5 Security Functions

The purpose of the security testing will be to evaluate the effectiveness of the OVS 1.2 in detecting, preventing, logging, reporting, and recovering from any security risks identified by simulating attacks on the system. To accomplish this, Wyle Laboratories has developed internal operating procedures to evaluate the Unisyn OVS 1.2 to the security requirements set forth in the EAC 2005 VVSG.

These procedures have been specifically tailored to assess the Unisyn OVS 1.2 to the applicable requirements. Wyle Laboratories will verify the access controls and physical security measures documented in the Unisyn technical data package. A threat matrix will be developed to determine the risks and vulnerabilities. Wyle Laboratories will utilize a combination of functional testing and source code review to evaluate the OVS 1.2 Voting System.

The following areas are not applicable to the OVS 1.2 and are; therefore, not included in the scope of the security testing:

- Use of Public Networks
- Wireless Communication

Wyle will report all issues discovered during this test campaign to Unisyn and the EAC. A report containing all findings shall be issued to the EAC as an Appendix to the final test report.

4.0 TEST SPECIFICATIONS (Continued)

4.6 TDP Evaluation

Wyle Laboratories-qualified personnel will perform a comprehensive review of the Unisyn TDP to determine compliance to the EAC 2005 VVSG requirements and Unisyn-specific requirements.

Wyle qualified personnel utilize a TDP Review Matrix which lists every EAC 2005 VVSG requirement pertaining to TDP review. Wyle Laboratories-qualified personnel 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, and correctness, and continuity between the TDP documents. The review results will be formally reported to Unisyn for resolution. 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 numerous other tests. At the end of the TDP review process, an Anomaly Report will be issued listing the non-compliant items on a document-by-document basis, if applicable.

A listing of all documents contained in the Unisyn OVS 1.2 System TDP is provided in Table 4-4.

Table 4-4 OVS 1.2 TDP Documents

OVS Release 1.0 Voting System TDP Documents	Version	Date	Document Number
System Overview	1.2	07/17/13	04-00446
System Security Specification	1.0	04/21/13	04-00447
Configuration Management Plan	1.0	09/09/13	04-00448
Quality Assurance Plan	1.0	09/09/13	04-00454
System Test and Verification Plan	1.0	07/07/13	04-00453
Personnel Training and Deployment Requirements	1.0	09/09/13	04-00445
Software and Design Specification	1.7	07/08/13	04-00464
Final Quality Assurance Report	1.0	06/20/13	04-00469
OVS Acronyms	1.0	04/21/13	04-00494
System Functionality Description	1.0	04/21/13	04-00444
System Maintenance Procedures	1.0	07/08/13	04-00459
System Hardware Specification	1.0	04/21/13	04-00458
Ballot Layout Manager User Guide	1.0	04/21/13	04-00428
Election Manager User Guide	1.0	04/21/13	04-00427
Election Server User Guide	1.0	07/04/13	04-00429
Software Server User Guide	1.0	09/09/13	04-00430
Tabulator Client User Guide	1.0	04/21/13	04-00431
Tabulator User Guide	1.0	04/21/13	04-00432
Tabulator Reports User Guide	1.0	04/21/13	04-00433
OVCS User Guide	1.0	04/21/13	04-00495
SOP: Election Day Poll worker's Guide	1.0	04/21/13	04-00463
SOP: Election Day Troubleshooter's Guide OVO and OVI	1.0	07/04/13	04-00462
System Operations Procedures: Warehouse Technician's Guide	1.0	04/21/13	04-00460
Ballot Paper Specification	1.0	07/16/13	04-00503
System HW Verification	1.0	07/07/13	04-00513
Adjudicator User Guide	1.0	04/21/13	04-00530

4.0 TEST SPECIFICATIONS (Continued)

4.7 Source Code Review (Continued)

As part of the testing activities, the Unisyn OVS 1.2 source code will be reviewed to the EAC 2005 VVSG coding standards and the manufacturer supplied coding standards. Unisyn uses the "Code Conventions for the Java™ Programming Language Revised April 20, 1999" coding convention. The review will be conducted per the guidelines described in the following paragraphs.

As the source code is received, a SHA1 hash value shall be created for each source code file. The source code team will then conduct automated source code review using Eclipse and Checkstyle because the source code is written entirely in JAVA. This is done to identify any violation of EAC 2005 VVSG coding standards or manufacturer-supplied coding standards. Each identified violation shall be recorded by making notes of the standards violation along with directory name, file name, and line number.

A technical summary report of all identified standards violations will be sent to Unisyn for resolution. Unisyn will then correct all standards violations and re-submit the source code for re-review. All reports will be included in an anomaly report for source code and submitted to the EAC and included in the final test report.

A "Compliance Build" shall be performed by Wyle from the reviewed source code using the Compliance Build Procedure to build iterative builds throughout the test campaign. This process follows the documented procedures of a "Trusted Build" in the EAC Testing and Certification Program Manual, Version 1.0, effective date January 1, 2007. A Compliance Build differs from a Trusted Build because of 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 final step in the source code review shall be to create a Trusted Build from the reviewed source code. The Trusted Build will be performed by completing the following tasks in the order listed:

- Clean the build machine of existing software
- Retrieve the compliant source code
- Construct the build environment
- Create digital signatures of the build environment
- Load the compliant source code into the build environment
- Create a digital signature of the pre build environment
- Create a disk image of the pre-build environment
- Build executable code
- Create a digital signature of executable code
- Create a disk image of the post-build environment
- Build installation media
- Create a digital signature of the installation media
- Install executable code onto the system and validate the software/firmware
- Deliver source code with digital signature, disk image of pre-build environment with digital signatures, disk image of post-build environment with digital signatures, executable code with digital signatures, and installation media with signatures to the EAC Approved Repository.

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4.0 TEST SPECIFICATIONS (Continued)

4.7 Source Code Review (Continued)

The "Trusted Build" for the Unisyn OVS 1.2 includes source code, data, and script files, in clear text form. The build also includes COTS software on commercially available media, COTS software downloaded by the VSTL, COTS software verified by SHA1 from the software supplier, and picture and sound files in binary format provided by Unisyn. The first step of the process is to clean the hard drives by writing data to every spot on the hard drive, so the drive is cleared of existing data. The appropriate operating system will then be loaded and the applications from the VSTL reviewed source along with the VSTL verified COTS software will be built. The final step is installing the applications on the hardware.

4.8 QA and CM System Review

The Unisyn QA Plan and CM Plan will be reviewed to determine compliance with EAC 2005 VVSG Volume II Section 2, and Volume I Sections 8 and 9, with EAC stated requirements, and with the requirements of the internal Unisyn documentation.

Also, the Unisyn TDP documentation package will be reviewed to determine if the Unisyn QA Plan and the CM Plan are being followed. The results of the TDP review will be entered on a spreadsheet as previously described in Section 4.6 TDP Evaluation. The results of the TDP review, including the QA and CM compliance results, will also 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 will be listed on the Instrumentation Equipment Sheet for each test. The output test data will be recorded in an appropriate manner as to allow for data analysis.

For source code and TDP reviews, results will be compiled in output reports and discrepancies submitted to Unisyn for resolution. Additionally, all test results, including functional test data, will be recorded on relevant Wyle Operating Procedures and Test Cases. Results will also be recorded real-time in engineering log books.

Wyle Laboratories, Inc. will evaluate all test results against the Unisyn provided technical documentation for the OVS 1.2 and the requirements set forth in the EAC 2005 VVSG. The OVS 1.2 shall be evaluated for its performance against the EAC 2005 VVSG. The acceptable range for system performance and the expected results for each test case shall be derived from the OVS 1.2 documentation. 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 which criteria define 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).

5.2 Test Data Reduction

Test data shall be processed and recorded in the relevant Wyle Laboratories' Operating Procedures and Test Cases. Results will also be recorded real-time in engineering log books.

6.0 TEST PROCEDURES AND CONDITIONS

The following subsections describe test procedures and a statement of the criteria by which readiness and successful completion shall be indicated and measured.

6.1 Facility Requirements

All testing will be conducted at Wyle Laboratories Huntsville, AL facility unless otherwise annotated. Hardware environmental non-operating (storage) and operating 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 Wyle Laboratories' Quality Assurance Program, which complies with the requirements of ANSI/NCSL Z540-1 and ISO 10012-1.

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:

- Temperature: 68 to 75 degrees Fahrenheit (± 4°F)
- Relative Humidity: 20 to 90%
- Atmospheric Pressure: Local Site Pressure

Unless otherwise specified herein, the following tolerances shall be used:

- Time ± 5%
- 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.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up

All voting machine equipment (hardware and software) shall be received and documented utilizing Wyle Laboratories' Receiving Ticket (WL-218, Nov'85) and proper QA procedures. When voting system hardware is received, Wyle Shipping and Receiving personnel will notify Wyle QA personnel. With Wyle QA personnel present, 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, shall be recorded, photographs shall be taken, and the Unisyn representative shall be notified.

Wyle Laboratories' 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 shall be brought to the attention of the Unisyn representative for resolution. TDP items, including all manuals, and all source code modules received will be inventoried and maintained by the Wyle Laboratories' Project Engineer assigned to testing.

For hardware test setup, the system will be configured as would for normal field use. This includes connecting all supporting equipment and peripherals. Wyle Laboratories' personnel will properly configure and initialize the system, and verify that it is ready to be tested, by following the procedures detailed in the OVS 1.2 technical documentation.

Wyle Laboratories will develop an operational status test to be performed prior to and immediately following each hardware test. Wyle Laboratories will develop the system performance levels to be measured during operational tests.

Wyle Laboratories has developed eight election definitions to be used during this test campaign.

Operational Status Check

This election definition will exercise the operational status of the OVS 1.2 System, during the operational hardware tests, and prior to and immediately following the non-operational hardware tests.

Accuracy

This test will exercise all possible voting positions for the ballot.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

General Election: GEN-01

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 fifteen 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, audio input in an alternative language will be exercised for a basic voting pattern using an ADA device. Audio input to demonstrate support for write-in voting will be exercised using an ADA device. Spanish language input will be exercised for a basic voting pattern using Spanish. Spanish language input will be exercised to demonstrate support for write-in voting using Spanish.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

General Election: GEN-02

A basic election held in three precincts. This election contains fifteen contests compiled into three ballot styles. Ten of the contests are in all three ballot styles with the other five split across the three precincts. This election was designed to functionally test the handling of multiple ballot styles, support for ballot rotation, support for two languages, support for complex voting variations, and audio support for multiple 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: No
- Cross-party endorsement: No
- Split Precincts: No
- Vote for N of M: Yes
- Recall issues, with options: Yes
- Cumulative voting: No
- Ranked order voting: Yes
- Provisional or challenged ballots: No
- Early Voting: Yes

In addition to the parameters listed above, this election will be an early voting election with at least one machine running all precincts. Voting options for Over-voting and Under-voting will be exercised. Spanish language voting will be exercised. Casting of ballots using the ADA Audio capability will be exercised.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

General Election: GEN-03

A basic election held in two precincts. This election contains eight contests compiled into two ballot styles. Four of the contests are in both ballot styles. The other four contests are split between the two precincts. This election was designed to functionally test the handling of multiple ballot styles, support for at least three languages including a character-based language, support for common voting variations, and audio support for at least three languages and an ADA binary input device.

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: No
- Straight Party voting: No
- Cross-party endorsement: No
- Split Precincts: No
- 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, input in the Spanish language with a basic voting pattern and a write-in will be exercised. Audio input using the Spanish language to demonstrate support for write-in voting using an ADA device will be exercised. A character-based language input with a basic voting pattern will be exercised. A character-based language using an ADA device will be exercised to demonstrate support for ADA device. A binary input to show support for ADA binary input device will be exercised. A binary input using an ADA audio device will be exercised to show support for binary input and ADA audio device.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

Primary Election: PRIM-01

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: No
- 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, input in an alternative language will be exercised with write-in voting. Input using an ADA audio device with write-in voting will be exercised. These inputs were selected to exercise the write-in functionality in a primary election.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

Primary Election: PRIM-02

A basic election held in two precincts. This election contains thirteen contests compiled into three ballot styles. One contest is in all three ballot styles and all other contests are independent. This election was designed to functionally test the handling of multiple ballot styles, support for Primary presidential delegation nominations, support for two languages, support for complex voting variations, and audio support for multiple 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: No
- Straight Party voting: No
- Cross-party endorsement: Yes
- Split Precincts: No
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: No
- Early Voting: No

In addition to the parameters listed above, this election will be an open primary election with one machine running for each precinct. Voting options for Over-voting, Under-voting and write-in voting will be exercised. Input in the Spanish language will be exercised. Casting of ballots using the ADA Audio capability will be exercised.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

Primary Election: PRIM-03

A basic election held in two precincts. This election contains ten contests and is compiled into two ballot styles. Two of the contests are in both ballot styles. The other eight contests are split between the two parties ballots. This election was designed to functionally test the handling of multiple ballot styles, support for at least three languages including an Ideographic based language, support for common voting variations, and audio support for at least three languages and an ADA binary input device.

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: No
- 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, input in the Spanish language with a basic voting pattern and a write-in will be exercised. Audio input using the Spanish language to demonstrate support for write-in voting using an ADA device will be exercised. A character-based language input with a basic voting pattern will be exercised. A character-based language using an ADA device will be exercised to demonstrate support for ADA device. A binary input to show support for ADA binary input device will be exercised. A binary input using an ADA audio device will be exercised to show support for binary input and ADA audio device.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence

The components of the OVS 1.2 voting system will undergo all applicable tests to the EAC 2005 VVSG. The following sections provide a list of each test and a brief description of each test. Wyle Laboratories will utilize a combination of functional testing, source code review, and TDP reviews to evaluate the system performance. The list of tests is not in a specific sequence.

6.3.1 Hardware Test Description

Hardware tests are divided into two categories: Non-Operating and Operating. The Non-Operating tests are intended to simulate the storage and transport of equipment between the storage facility and the polling location. The Operating tests are intended to simulate conditions that the EUT may encounter during operation. Prior to and immediately following Operating test, the EUT will be subjected to an operational status check.

The Operating tests include the following:

Electromagnetic Radiation (emissions) – This test verifies that radiated and conducted emissions from the voting system hardware do not exceed the allowable limits of Title 47CFR, Part 15, Class B. The test for electromagnetic radiation shall be conducted in compliance with the FCC Part 15 Class B requirements by testing per ANSI C63.4 (Volume II, Section 4.8.b).

Electromagnetic Susceptibility – This test demonstrates the ability of the voting system's hardware to withstand radiated electromagnetic fields during normal operation. This test is equivalent to the procedure of IEC 61000-4-3. The test for electromagnetic susceptibility shall be conducted in compliance with the test specified in IEC 61000-4-3 (Volume II, Section 4.8.d.).

Conducted RF Immunity – This test demonstrates the voting system's hardware ability to withstand conducted RF energy on power and I/O lines during normal operation. This test is equivalent to the procedure of IEC 61000-4-6. The test for conducted RF immunity shall be conducted in compliance with the test specified in IEC 61000-4-6 (Volume II, Section 4.8.g).

Magnetic Fields Immunity – This test demonstrates the voting system's hardware ability to withstand Magnetic Fields during normal operation. This test is equivalent to the procedure of IEC 61000-4-8. The test for AC magnetic fields RF immunity shall be conducted in compliance with the test specified in IEC 61000-4-8 (Volume II, Section 4.8.h).

Electrostatic Disruption – This test demonstrates the voting system's hardware to withstand electrostatic discharges during normal operation. This test is equivalent to the procedure of IEC 61000-4-2. The test for electrostatic disruption shall be conducted in compliance with the test specified in IEC 61000-4-2 (Volume II, Section 4.8.c). This test will be performed on the OVO and OVI units. The purpose of this test is to ensure that the hardware modifications do not negatively impact the units for the current test campaign.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.2 Software Test Description

The software tests include the following:

Source Code Compliance Review – Wyle Laboratories personnel will compare the source code to the manufacturer's software design documentation to ascertain how completely the software conforms to the manufacturer's specifications. A listing of the TDP documents for Software Design and Specification can be found in Table 4-5 of this document. Source code inspection shall also assess the extent to which the code adheres to the requirements in Section 5 of Volumes I and II.

Compliance Build of the System Software, Firmware, and Utilities – Before testing can begin a compliance build of all the applications will be constructed by Wyle personnel using the build environment, build documentation and reviewed source code. This is to ensure the software being tested is constructed from the same source code that was reviewed.

COTS Source Code Review – Unmodified, general purpose COTS non-voting software (e.g., operating systems, programming language compilers, data base management systems, and Web browsers) is not subject to the detailed examinations specified in this section. However, Wyle Laboratories personnel will examine such software to confirm the specific version of software being used against the design specification to confirm that the software has not been modified. Wyle will verify by downloading the software directly from the manufacturer site, verifying against NRSL, or by being provided original OEM discs.

Portions of COTS software that have been modified by the manufacturer in any manner are subject to review. Unmodified COTS software is not subject to code examination. However, source code generated by a COTS package and embedded in software modules for compilation or interpretation will be provided in human readable form to Wyle Laboratories. Wyle Laboratories personnel may inspect COTS source code units to determine testing requirements or to verify the code is unmodified.

Wyle Laboratories may inspect the COTS generated software source code in preparation of test plans and to provide some minimal scanning or sampling to check for embedded code or unauthorized changes. Otherwise, the COTS source code is not subject to the full code review and testing. For purposes of code analysis, the COTS units shall be treated as unexpanded macros, as per Volume II, Section 5.2 of the EAC 2005 VVSG.

Baseline of EMS Operating and Build Machine OS – Wyle will review the submitted NIST SCAP FDCC checklist for the EMS Operating System and Build Machine OS Unisyn. The review will be performed for completeness, clarity, and consistency.

Error Recovery Test – This will be tested to ensure that unit is capable of recovering from a non- catastrophic failure of a device, or from any error or malfunction that is within the operator’s ability to correct and restore the device gracefully from the failures. Testing will include powering units off while operating, disconnecting various cables and components to ensure operation once restored.

Security Source Code Review – The security source code review is a detailed review of the functionality of the source code that has been submitted. Both automated and manual reviews of the source code will be performed.

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.2 Software Test Description (Continued)

Trusted Build – The trusted build is a process of converting the reviewed source code into machine-readable binary instructions for a computer. This test will follow Section 5.6 of the EAC Testing and Certification Program manual.

Table 6-1 OVS 1.2 System Software Test Sequence

Test	Description	Procedure	Test Level	Specimen
Compliance Source Code Review	Source code review for compliance	WHVS07.2 WOP 5a	Component	OVS 1.2 Source Code Package
Compliance Build	Using the build documents and source code to construct the EMS	WHVS07.3 WOP 7b	Component	OVS 1.2
Source Code COTS Review	Source code review to examine 3rd party products for modification and versions	WHVS07.2 WOP 5d	Component	OVS 1.2 Source Code Package
Baseline OS	RFI 2008-03 OS Configuration	WHVS07.3 WOP 25	Component	OVS 1.2
Source Code Functional Review	Source code review for functionality and high level software design	WHVS07.2 WOP5b	Component & Integration	OVS 1.2 Source Code Package
Source Code Security Review (manual)	Source code review for specific security concerns	WHVS07.2 WOP5c WOP 6a	Component & Integration	OVS 1.2 Source Code Package

6.3.3 System Testing

Physical Configuration Audit – 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
- Review drawings, specifications, technical data, and test data associated with system hardware, if non-COTS, 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

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.3 System Testing (Continued)

Functional Configuration Audit – 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 for the TDP. In addition to functioning according to the manufacturer's documentation, tests shall be conducted to ensure all 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 VVSG requirements. The path that the tester navigates follows the logical flow of accomplishing task required to conduct an election or otherwise exercise a function. 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.

TDP Review – The technical data package must be submitted as a precondition of national certification testing. These items are necessary to define the product and its method of operation; to provide technical and test data supporting the manufacturer's claims of the system's functional capabilities and performance levels; and to document instructions and procedures governing system operation and field maintenance. Any information relevant to the system evaluation shall be submitted to include source code, object code, and sample output report formats.

Security Test – The security test is designed and performed to test the capabilities of the voting system against the requirements defined in Volume I Section 7. These procedures shall focus on the ability of the system to detect, prevent, log, and recover from a broad range of security risks identified. This test will also examine system capabilities and safeguards claimed by Unisyn in the TDP to properly mitigate these risks. The range of risks tested is determined by the design of the system and potential exposure to risk.

Telecommunication Test – The telecommunication test focuses on system hardware and software function and performance for the transmission of data that is used to operate the system and report election results. This test applies to the requirements for Volume I, Section 6 of the EAC 2005 VVSG.

Usability – The usability test is a measure of the effectiveness, efficiency, and satisfaction achieved by a specified set of users with a given product in the performance of specified tasks. This test applies to the requirements for Volume I, Section 3 of the EAC 2005 VVSG.

Accuracy – The accuracy test ensures that each component of the voting system can each process 1,549,703 consecutive ballot positions correctly within the allowable target error rate. The Accuracy test is designed to test the ability of the system to "capture, record, store, consolidate and report" specific selections and absences of a selection. The required accuracy is defined as an error rate. This rate is the maximum number of errors allowed while processing a specified volume of data. For paper-based voting systems the ballot positions on a paper ballot must be scanned to detect selections for individual candidates and contests and the conversion of those selections detected on the paper ballot converted into digital data.

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.3 System Testing (Continued)

In an effort to achieve this and to verify the proper functionality of the units under test, the following methods will be used to test each component of the voting system:

The accuracy requirements for the OVO will be met by the execution of the standard accuracy test.

- Stand-Alone Precinct Scanner – Tested by utilizing a combination of hand marked (70%) and pre-marked (30%) ballots to achieve accuracy rate greater than 1,549,703 correct ballot positions.

The accuracy requirements for the OVCS will be met by the execution of the standard accuracy test.

- Stand-Alone Central Count Scanner - Tested by utilizing a combination of hand-marked (70%) and pre-marked (30%) ballots to achieve accuracy rate greater than 1,549,703 correct ballot positions.

The accuracy requirements for the OVI will be met by the execution of following accuracy test.

- Multiple OVIs will be used to achieve an accuracy rate greater than 1,549,703 correct ballot positions marked.
- The marked ballots will be also be scanned through the OVCS for accuracy.

System Integration – System Level certification test address the integrated operation of both hardware and software, along with any telecommunication capabilities. Compatibility of the voting system software components or subsystems with one another, and with other components of the voting system environment, shall be determined through functional tests integrating the voting system software with the remainder of the system.

Additionally, the system shall be configured exactly as it would for normal field use. 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. Wyle Laboratories personnel will properly configure and test the system by following the procedures detailed in the OVS 1.2 Voting System technical documentation.

Regression Testing

Regression Testing will be performed on all applicable system components to verify all firmware and application software modifications are working as expected.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.3 System Testing (Continued)

Table 6-2 OVS 1.2 Testing Sequence

Test	Description	Procedure	Test Level	Specimen	Election Data	Re-Use from Previous VSTL Testing
Technical Data Package (TDP) Review	Documentation review for compliance, correctness, and completeness	WHVS07.1 WOP 3	Document	TDP package	---	No
Physical Configuration Audit	Audit hardware and software models and versions	WHVS07.3 WOP 25	Component & System	System hardware and software	---	No
Functional Configuration Audit	Functional testing to the system documentation and EAC 2005 VVSG requirements	WHVS07.4 WOP 26 WOP30a	Component & Integration	System	Gen-01 Prim-01	Yes/ Perform FCA on the changes
Telecommunication (EMS Network)	Test of telecommunication technology of the system for accuracy and correctness	WHVS07.6 WOP 31	Integration & System	System	Gen-01	No
Usability/ Accessibility	Testing to the system documentation and EAC 2005 VVSG requirements	WOP 24-2d	Integration	System	Gen-01 Prim-01	No
Volume, Stress, & Reliability Test	Test to investigate the system's response to larger amounts of data than it is expecting.	WOP 21 WOP 30	System	System	Volume and Stress Election	Yes
Security	Assess the system to the 2005 VVSG requirements and execute basic system security tests.	WHVS07.7 WOP 6 WOP 6a WOP 6b WOP 6c WOP 6d	Integration & System	System	Gen-01 Prim -01	No
Accuracy	Test of accuracy to ~1.6 million ballot positions per system component (OVO, OVI, and OVCS)	WHVS07.9 WOP 30 WOP 21	System	System	Accuracy Elections	No
System Integration Test	Test of all system hardware, software and peripherals.	WOP 30	System	System	Gen-01-03 Prim-01-03	No
Trusted Build	Creation and installation of the final system software	WHVS07.6 WOP 7 WOP 7a	Component	System software	OVS 1.2 Source Code Package	No

7.0 TEST OPERATIONS PROCEDURES

7.1 Proprietary Data

All proprietary data that is marked will be distributed only to those persons that the manufacturer or EAC identifies as needing the information to conduct qualification testing. The manufacturer is required to mark all proprietary documents as such. All organizations and individuals receiving proprietary documents will ensure those documents are not available to non-authorized persons.

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APPENDIX A
UNISYN PROJECT SCHEDULE

ID	Task Name	Duration	Start	Finish	Predecessors
1	**EAC Application**	**1 day**	**Thu 5/23/13**	**Thu 5/23/13**	
2	**EAC Kickoff Meeting (Conference Call)**	**1 day**	**Tue 6/11/13**	**Tue 6/11/13**	
3	**Technical Data Package Review**	**52 days**	**Thu 5/30/13**	**Tue 8/13/13**	
4	Partial Document Submission	1 day	Thu 5/30/13	Thu 5/30/13	
5	Document Review for Test Plan Requirements	5 days	Fri 5/31/13	Thu 6/6/13	4
6	Full TDP SUBMISSION	1 day	Mon 7/1/13	Mon 7/1/13	1
7	TDP Review for VVSG Requirements	20 days	Tue 7/2/13	Wed 7/31/13	6
8	TDP Final Report to ILTS	2 days	Thu 8/1/13	Fri 8/2/13	7
9	Final Review of Report and Correct Documents	5 days	Mon 8/5/13	Fri 8/9/13	8
10	Final Report TDP Review	2 days	Mon 8/12/13	Tue 8/13/13	9
11	**Source Code Review**	**19 days**	**Fri 5/31/13**	**Wed 6/26/13**	
12	Submission of Coding Standards	1 day	Fri 5/31/13	Fri 5/31/13	
13	Wyle Review of Software Documents Prepare Code Review Plan	5 days	Mon 6/3/13	Fri 6/7/13	12
14	**Source Code Review**	**18 days**	**Mon 6/3/13**	**Wed 6/26/13**	
15	Wyle Source Code Review	10 days	Mon 6/3/13	Fri 6/14/13	12
16	Unisyn Review code	4 days	Mon 6/17/13	Thu 6/20/13	15
17	Wyle re-review of Source Code	3 days	Fri 6/21/13	Tue 6/25/13	16
18	Wyle Report	1 day	Wed 6/26/13	Wed 6/26/13	17
19	**Test Plan**	**59 days**	**Tue 6/4/13**	**Tue 8/27/13**	
20	Draft Test Plan	15 days	Tue 6/4/13	Mon 6/24/13	
21	Draft Test Plan Reviewed by ILTS	2 days	Tue 6/25/13	Wed 6/26/13	20
22	Draft Test Plan Update	1 day	Thu 6/27/13	Thu 6/27/13	21
23	Test Plan to EAC	1 day	Fri 6/28/13	Fri 6/28/13	22
24	EAC Review	20 days	Mon 7/1/13	Tue 7/30/13	23
25	Review TR's Comments	4 days	Wed 7/31/13	Mon 8/5/13	24
26	Revise Test Plan	5 days	Tue 8/6/13	Mon 8/12/13	25

ID	Task Name	Duration	Start	Finish	Predecessors
27	Re Submit Test Plan to EAC	1 day	Tue 8/13/13	Tue 8/13/13	26
28	Test Plan Approved by EAC	10 days	Wed 8/14/13	Tue 8/27/13	27
29	**Physical Configuration Audit**	**7 days**	**Thu 6/27/13**	**Tue 7/9/13**	
30	**PCA SCAP Checklist (Baseline of OS)**	**7 days**	**Thu 6/27/13**	**Tue 7/9/13**	
31	Research FDCC for all OS and Server for System (work with EAC)	2 days	Thu 6/27/13	Fri 6/28/13	14
32	Submit Benchmark Checklist to Manufacturer	1 day	Mon 7/1/13	Mon 7/1/13	31
33	Manufacturer Review	2 days	Tue 7/2/13	Wed 7/3/13	32
34	Analysis Manufacturers Response	1 day	Mon 7/8/13	Mon 7/8/13	33
35	Report to Manufacturer Any Discrepancies	1 day	Tue 7/9/13	Tue 7/9/13	34
36	System Set up and Initial Software Loads	23 days	Fri 5/31/13	Tue 7/2/13	
37	**Network Setup**	**2 days**	**Fri 5/31/13**	**Mon 6/3/13**	
38	Initial Hardening and Network setup	2 days	Fri 5/31/13	Mon 6/3/13	4
39	**Build Review**	**1 day**	**Thu 6/27/13**	**Thu 6/27/13**	
40	**Source Build Review**	**1 day**	**Thu 6/27/13**	**Thu 6/27/13**	**14**
41	**Create Build Environments**	**3 days**	**Fri 6/28/13**	**Tue 7/2/13**	
42	**Compliance Builds**	**3 days**	**Fri 6/28/13**	**Tue 7/2/13**	**40**
43	**Hardware Tests**	**3 days**	**Wed 7/10/13**	**Fri 7/12/13**	
44	Quick Scan	2 days	Wed 7/10/13	Thu 7/11/13	
45	ESD	1 day	Fri 7/12/13	Fri 7/12/13	44
46	**FCA**	**27 days**	**Fri 6/28/13**	**Wed 8/7/13**	
47	**Pre FCA**	**15 days**	**Fri 6/28/13**	**Mon 7/22/13**	
48	Wyle develop and validate test cases	15 days	Fri 6/28/13	Mon 7/22/13	40
49	**FCA Execution**	**12 days**	**Tue 7/23/13**	**Wed 8/7/13**	
50	Excute Test Cases	10 days	Tue 7/23/13	Mon 8/5/13	48
51	**FCA Completion**	**2 days**	**Tue 8/6/13**	**Wed 8/7/13**	
52	Report FCA Test	2 days	Tue 8/6/13	Wed 8/7/13	50

ID	Task Name	Duration	Start	Finish	Predecessors
53	**System Level Performance Testing**	**6 days**	**Thu 8/8/13**	**Thu 8/15/13**	
54	**Accuracy Test**	**6 days**	**Thu 8/8/13**	**Thu 8/15/13**	
55	Execution of Accuracy Test	5 days	Thu 8/8/13	Wed 8/14/13	29,46
56	Completion of Accuracy Test	1 day	Thu 8/15/13	Thu 8/15/13	55
57	**Security Test**	**2 days**	**Thu 8/8/13**	**Fri 8/9/13**	
58	**Access Controls Review (WoP 6)**	**2 days**	**Thu 8/8/13**	**Fri 8/9/13**	
59	Completion of Access Control Review	2 days	Thu 8/8/13	Fri 8/9/13	46,29
60	**Security Assessment**	**2 days**	**Mon 8/12/13**	**Tue 8/13/13**	
61	Report Security Assessment	2 days	Mon 8/12/13	Tue 8/13/13	57
62	**System Integration Testing**	**13 days**	**Fri 8/16/13**	**Wed 9/4/13**	
63	**GEN 01 - Contests, Candidates, Alt Language, Split Precinct, and Audio Ballot**	**2 days**	**Fri 8/16/13**	**Mon 8/19/13**	
64	GEN 01 Setup	0.5 days	Fri 8/16/13	Fri 8/16/13	53
65	GEN 01 Execution	1 day	Fri 8/16/13	Mon 8/19/13	64
66	GEN 01 Complete	0.5 days	Mon 8/19/13	Mon 8/19/13	65
67	**GEN 02 - N of M, Recall, Early Voting, Alt Language and Audio Ballot**	**2 days**	**Tue 8/20/13**	**Wed 8/21/13**	
68	GEN 02 Setup	0.5 days	Tue 8/20/13	Tue 8/20/13	66
69	GEN 02 Execution	1 day	Tue 8/20/13	Wed 8/21/13	68
70	GEN 02 Complete	0.5 days	Wed 8/21/13	Wed 8/21/13	69
71	**GEN 03 - Ideographic Language, Audio Ballot, and ADA Devices**	**2 days**	**Thu 8/22/13**	**Fri 8/23/13**	
72	GEN 03 Setup	0.5 days	Thu 8/22/13	Thu 8/22/13	70
73	GEN 03 Execution	1 day	Thu 8/22/13	Fri 8/23/13	72
74	GEN 03 Complete	0.5 days	Fri 8/23/13	Fri 8/23/13	73
75	**PRIM 01 - Closed Primary, Split Precinct, Multiple Ballot Styles, and Audio Ballot**	**2 days**	**Mon 8/26/13**	**Tue 8/27/13**	
76	PRIM 01 Setup	0.5 days	Mon 8/26/13	Mon 8/26/13	74
77	PRIM 01 Execution	1 day	Mon 8/26/13	Tue 8/27/13	76

ID	Task Name	Duration	Start	Finish	Predecessors
78	PRIM 01 Complete	0.5 days	Tue 8/27/13	Tue 8/27/13	77
79	**PRIM 02 - Open Primary, Multiple Ballot Styles, Slate Voting, Cross-party Endorsement, and Audio Ballot**	**2 days**	**Wed 8/28/13**	**Thu 8/29/13**	
80	PRIM 02 Setup	0.5 days	Wed 8/28/13	Wed 8/28/13	78
81	PRIM 02 Execution	1 day	Wed 8/28/13	Thu 8/29/13	80
82	PRIM 02 Complete	0.5 days	Thu 8/29/13	Thu 8/29/13	81
83	**PRIM 03 - Closed Primary, Ideographic Language, and ADA devices**	**2 days**	**Fri 8/30/13**	**Mon 9/2/13**	
84	PRIM 03 Setup	0.5 days	Fri 8/30/13	Fri 8/30/13	82
85	PRIM 03 Execution	1 day	Fri 8/30/13	Mon 9/2/13	84
86	PRIM 03 Complete	0.5 days	Mon 9/2/13	Mon 9/2/13	85
87	**Completion of System Integration Testing**	**1 day**	**Wed 9/4/13**	**Wed 9/4/13**	
88	Final Report System Integration Tests	1 day	Wed 9/4/13	Wed 9/4/13	86
89	**All Testing Activities Completed**	**2 days**	**Thu 9/5/13**	**Fri 9/6/13**	
90	Verification and compilation of all test data	2 days	Thu 9/5/13	Fri 9/6/13	3,29,46,53,62
91	**PCA Completion**	**2 days**	**Mon 9/9/13**	**Tue 9/10/13**	
92	Regression All Changes to PCA that Occurred during the Test Campaign	1 day	Mon 9/9/13	Mon 9/9/13	89
93	Final Report PCA	1 day	Tue 9/10/13	Tue 9/10/13	92
94	**Final Trusted Build**	**12 days**	**Wed 9/11/13**	**Thu 9/26/13**	
95	Verify Build Environment	1 day	Wed 9/11/13	Wed 9/11/13	91
96	Trusted Build	4 days	Thu 9/12/13	Tue 9/17/13	95
97	Install and Verify System Build	4 days	Wed 9/18/13	Mon 9/23/13	96
98	Final Trusted Build Complete	1 day	Tue 9/24/13	Tue 9/24/13	97
99	Delivery of Images to EAC Repository	2 days	Wed 9/25/13	Thu 9/26/13	98
100	**Post Testing Activities**	**34 days**	**Wed 9/11/13**	**Mon 10/28/13**	
101	**Certification Report**	**34 days**	**Wed 9/11/13**	**Mon 10/28/13**	
102	Initial Draft Report	10 days	Wed 9/11/13	Tue 9/24/13	91

ID	Task Name	Duration	Start	Finish	Predecessors
103	Manufacturer Review	2 days	Wed 9/25/13	Thu 9/26/13	102
104	Final Test Report for Submission to EAC for Review	2 days	Fri 9/27/13	Mon 9/30/13	103
105	EAC Review	20 days	Tue 10/1/13	Mon 10/28/13	104

APPENDIX F

FUNCTIONAL CONFIGURATION AUDIT ISSUES REPORT

ID	Status	Summary
5	resolved	Clear USB Election Files After Load Option not working on OVI
6	resolved	OVO Unit S/N UNI000037 - Bad Ballot Scanner
10	resolved	OVO and OVI - Inconsistency During System Boot after USB Election Load
11	resolved	OVO Unit S/N UNI000039 - OVO system locked up
12	resolved	Election Manager - Error when Importing XML for New Election - Contest ID too long
13	resolved	Ballot Layout Manager - Contest Import Error when using Manual Contest ID's
14	resolved	Ballot Layout Manager - Error Message when a Duplicate Negative ID is entered, reference to Duplicate is missing
15	resolved	Voter Turnout Report - Description of Options for report not in TDP and Ballots Cast value not calculating properly
16	resolved	OVI Straight Ticket Instructions has no translation and doesn't show up on OVI
17	resolved	BLM - Maximum Characters Error in Header Code field
18	resolved	BLM - Screen Resolution is incorrect and prevents BLM and other OCS application from displaying properly
19	resolved	OVO S/N UNI000049 - OVO Application Locked Up
20	resolved	Graphics preview header offset
21	resolved	Adjudicator: Entire Candidate Name NOT Selectable
25	resolved	OVO Out of Paper/Election Summary/Zero Proof Issue
26	resolved	EM - Null pointer issue
27	resolved	BLM - Precinct Type field is editable, but Precinct cannot be added unless field is populated with one of the predefined values
28	resolved	BLM - Measure Header is no longer bolded when Chinese characters are located in the Ballot Title field of a Measure
29	resolved	OVI 15 S/N 50 issue during accuracy test
30	resolved	Ballot header text incorrect display
31	resolved	BLM - Election Proof Report does not display Measures with color filling the Measure Text area, correctly
32	resolved	BLM - When Adding a Header, Sometimes Only Some of the Available Contests Displays in Unassigned Column

APPENDIX G

NOTICES OF ANOMALY

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NOTICE OF ANOMALY	DATE: 07/17/2013	ORIGINAL
Notice No: 1	P.O. Number: 004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz		Notification Date: 07/15/2013
Notification Made By: Stephen Han		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 07/12/2013
Part Name: OVO		Part Number:
Test: FCC Quick Scans		Serial/ID Number: UNI000036
Specification: 2005 VVSG Volume I		Paragraph/Section Number: 4.1.2.9

REQUIREMENTS: 2005 VVSG Volume I section 4.1.2.9

Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall comply with the Rules and Regulations of the Federal Communications Commission, Part 15; Class B requirements for both radiated and conducted emissions.

DESCRIPTION OF ANOMALY:

A quick scan discovered that the OVO did not meet the emissions levels for this requirement.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client. Additional EMC/EMI testing will have to be performed.

Potential 10 CFR Part 21	☐Yes	☒No
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer	☐ Wyle
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION	
Test Witness: None	Project Engineer: [illegible] 7/17/13
Representing: N/A	Project Manager: [illegible] 7/17/13
Quality Assurance: [illegible] 7/[illegible]/13	

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NOTICE OF ANOMALY	DATE: 07/17/2013 (ORIGIN)	
Notice No: 2	P.O. Number: 004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz		Notification Date: 07/15/2013
Notification Made By: Stephen Han		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 07/12/2013
Part Name: OVI-VC 15 inch screen		Part Number:
Test: FCC Quick Scans		Serial/ID Number: UNI203030
Specification: 2005 VVSG Volume I		Paragraph/Section Number: 4.1.2.9

REQUIREMENTS: 2005 VVSG Volume I section 4.1.2.9

Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall comply with the Rules and Regulations of the Federal Communications Commission, Part 15; Class B requirements for both radiated and conducted emissions.

DESCRIPTION OF ANOMALY:

A quick scan discovered that the OVI-VC 15 inch screen did not meet the emissions levels for this requirement.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client. Additional EMC/EMI testing will have to be performed.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer ☐ Wyle	
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: Stephen Han 7/17/13
Representing: N/A	Project Manager: Fred Pachito 7/17/13
Quality Assurance: Brenda Mena 7/18/13	

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NOTICE OF ANOMALY	DATE: 08/21/2013	ORIGINAL
Notice No: 3	P.O. Number: 004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz		Notification Date: 08/21/2013
Notification Made By: Stephen Han		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 08/21/2013
Part Name: OVO		Part Number:
Test: Electromagnetic Susceptibility		Serial/ID Number: UNI000018
Specification: 2005 VVSG Volume I		Paragraph/Section Number: 4.1.2.10

REQUIREMENTS:

2005 VVSG Volume I section 4.1.2.10
Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand an electromagnetic field of 10 V/m modulated by a 1 kHz 80% AM modulation over the frequency range of 80 MHz to 1000 MHz, without disruption of normal operation or loss of data.

DESCRIPTION OF ANOMALY:

This test was conducted using an auto-feed or "shoeshine" mode. During the test, the unit failed to continuously scan the ballot in the shoeshine mode. The ballot was left in the paper path and had to be removed manually. The unit did not lose power, and the unit did not lose any data. Once the ballot was removed, the unit operated normally. Wyle was able to replicate this anomaly.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes	☒No
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer	☐ Wyle
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: Stephen Han 8/21/13
Representing: N/A	Project Manager: [signature] 8/22/13

Quality Assurance: [signature] 8/23/2013

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NOTICE OF ANOMALY		DATE: 09/10/2013
Notice No: 4	P.O. Number: 004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz		Notification Date: 09/10/2013
Notification Made By: Stephen Han		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 08/22/2013
Part Name: OVI-15 Inch screen		Part Number:
Test: Electromagnetic Susceptibility		Serial/ID Number: UNI203066
Specification: 2005 VVSG Volume I		Paragraph/Section Number: 4.1.2.10

REQUIREMENTS:

2005 VVSG Volume I section 4.1.2.10
Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand an electromagnetic field of 10 V/m modulated by a 1 kHz 80% AM modulation over the frequency range of 80 MHz to 1000 MHz, without disruption of normal operation or loss of data.

DESCRIPTION OF ANOMALY:

The test was conducted with the unit in audio mode. During Post operational status check, 5 ballots were printed by the OVI to be cast into the OVO. The OVO would not read the first ballot due to ambiguous print at the top of the first ballot.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer ☐ Wyle	
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: Stephen Han 9/10/13
Representing: N/A	Project Manager: Frank Parker 9/10/13
Quality Assurance: Mike Capps 09/12/13	

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NOTICE OF ANOMALY		DATE: 09/10/2013
Notice No: 5	P.O. Number: 004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz		Notification Date: 09/10/2013
Notification Made By: Stephen Han		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 08/23/2013
Part Name: OVI-7 inch screen		Part Number:
Test: ~~ESC Quick Scans~~ ESD SH 9/10/13		Serial/ID Number: UNI150049
Specification: 2005 VVSG Volume I		Paragraph/Section Number: 4.1.2.8

REQUIREMENTS: 2005 VVSG Volume I section 4.1.2.9

Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand ±15 kV air discharge and ±8 kV contact discharge without damage or loss of data. The equipment may reset or have momentary interruption so long as normal operation is resumed without human intervention or loss of data. Loss of data means votes that have been completed and confirmed to the voter.

DESCRIPTION OF ANOMALY:

The test was conducted with the unit in audio mode. The printer advanced paper and printed ambiguous print at the top of the ballot. Theses ballots could not be read into the OVO. Two times on +8kv contact on the keyhole.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer ☐ Wyle	
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: Steph Ha 9/10/13
Representing: N/A	Project Manager: Jack Pate 9/10/13
Quality Assurance: Michael Cooper 09/10/2013	

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NOTICE OF ANOMALY	DATE: 09/16/2013 ORIGINAL	
Notice No: 6	P.O. Number: 004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz		Notification Date: 08/28/2013
Notification Made By: Stephen Han		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 08/27/2013
Part Name: OVO		Part Number:
Test: Electromagnetic Susceptibility		Serial/ID Number: UNI000018
Specification: 2005 VVSG Volume I		Paragraph/Section Number: 4.1.2.10

REQUIREMENTS:

2005 VVSG Volume I section 4.1.2.10
Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand an electromagnetic field of 10 V/m modulated by a 1 kHz 80% AM modulation over the frequency range of 80 MHz to 1000 MHz, without disruption of normal operation or loss of data.

DESCRIPTION OF ANOMALY:

This is the second attempt to perform this test. A USB cable to the scanner was replaced with another cable. However, this modification did not resolve the issue. This test was conducted using an auto-feed or "shoeshine" mode. During the test, the unit failed to continuously scan the ballot in the shoeshine mode. The ballot was left in the paper path and had to be removed manually. The unit did not lose power, and the unit did not lose any data. Once the ballot was removed, the unit operated normally.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer	☐ Wyle
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: 9/16/13
Representing: N/A	Project Manager: 9/16/13
Quality Assurance: 09/23/2013	

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NOTICE OF ANOMALY		DATE: 09/10/2013	
Notice No: 7	P.O. Number: 004002		Contact No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01	
Notification Made To: Chris Ortiz		Notification Date: 09/10/2013	
Notification Made By: Stephen Han		Via: Email	
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 09/05/2013	
Part Name: OVO		Part Number:	
Test: Electromagnetic Susceptibility		Serial/ID Number: UNI000018	
Specification: 2005 VVSG Volume I		Paragraph/Section Number: 4.1.2.10	

REQUIREMENTS:

2005 VVSG Volume I section 4.1.2.10
Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand an electromagnetic field of 10 V/m modulated by a 1 kHz 80% AM modulation over the frequency range of 80 MHz to 1000 MHz, without disruption of normal operation or loss of data.

DESCRIPTION OF ANOMALY:

This is the 3rd attempt to perform this test. An application firmware update was performed on the unit. However, this modification did not resolve the issue. This test was conducted using an auto-feed or "shoeshine" mode. During the test, the unit failed to continuously scan the ballot in the shoeshine mode. The ballot was left in the paper path and had to be removed manually. The unit would not respond and had to be powered off. The unit did not lose any data. Once the unit was powered cycled, it operated normally.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21 ☐Yes ☒No		
Responsibility to analyze anomalies and comply with 10 CFR PART 21 ☐ Customer ☐ Wyle		
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION	
Test Witness: None	Project Engineer: *Stephen Han* 9/10/13
Representing: N/A	Project Manager: *[signature]* 9/10/13
Quality Assurance: *[signature]* 09/12/2013	

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NOTICE OF ANOMALY		DATE: 09/10/2013	
Notice No: 8	P.O. Number:	004002	Contact No: N/A
Customer: Unisyn			Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz			Notification Date: 09/10/2013
Notification Made By: Stephen Han			Via: Email

Category: ☒Specimen ☐Procedure ☐Test Equipment	Date of Anomaly: 09/06/2013
Part Name: OVI-15 inch screen	Part Number:
Test: ~~FCC Quick Scans~~ ESD SH 9/10/13	Serial/ID Number: UNI203066
Specification: 2005 VVSG Volume I	Paragraph/Section Number: 4.1.2.8

REQUIREMENTS: 2005 VVSG Volume I section 4.1.2.9

Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand ±15 kV air discharge and ±8 kV contact discharge without damage or loss of data. The equipment may reset or have momentary interruption so long as normal operation is resumed without human intervention or loss of data. Loss of data means votes that have been completed and confirmed to the voter.

DESCRIPTION OF ANOMALY:

The test was conducted with the unit in audio mode. The printer advanced the paper and printed ambiguous print at the top of the ballot. Theses ballots could not be read into the OVO. The anomaly occurred on -8kv contact on the metal monitor bracket on the side of the unit.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer	☐ Wyle
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: Stephen Han 9/10/13
Representing: N/A	Project Manager: Fred Pakbaz 9/10/13
Quality Assurance: John Cooper 09/12/2013	

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NOTICE OF ANOMALY		DATE: 09/19/2013	
Notice No: 9	P.O. Number:	004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number:	T70987.01
Notification Made To: Chris Ortiz		Notification Date:	09/19/2013
Notification Made By: Stephen Han		Via:	Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly:	09/18/2013
Part Name: OVI-VC 15 inch screen		Part Number:	
Test: Acoustic Noise Level and Hearing Aid Compatibility		Serial/ID Number:	UNI203066
Specification: 2005 VVSG Volume I		Paragraph/Section Number:	3.2.2.2

REQUIREMENTS: 2005 VVSG Volume I: Section 3.2.2.2; Section 3.1.7.1; RFI 2013-02

The system hardware shall set the initial volume for each voter between 40 and 50 dB SPL. RFI 2013-02 recommends that the initial volume be set between 60-70 dB SPL. The voting machine shall provide a volume control with an adjustable volume from a minimum of 20 dB SPL up to a maximum of 100 dB SPL, in increments no greater than 10 dB.

DESCRIPTION OF ANOMALY:

Wyle engineers performed the Acoustic Noise Level Test and Hearing Aid Compatibility on the OVI-VC. The OVI-VC failed to achieve the required maximum volume of 100 dB SPL. The maximum volume produced was 66 dB SPL.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The test was halted. The final disposition is pending root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes ☒No		
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer ☐ Wyle		
CAR Required: ☐Yes ☒No	CAR Number:		

VERFICATION

Test Witness: None		Project Engineer:	9/19/13
Representing: N/A		Project Manager:	9/19/13
Quality Assurance:	9/20/2013		

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NOTICE OF ANOMALY		DATE: 09/23/2013 ORIGINAL	
Notice No: 10	P.O. Number:	004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number:	T70987.01
Notification Made To: Chris Ortiz		Notification Date:	09/17/2013
Notification Made By: Stephen Han		Via:	Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly:	09/17/2013
Part Name: OVO		Part Number:	
Test: Accuracy		Serial/ID Number:	UNI000042
Specification: 2005 VVSG Volume I		Paragraph/Section Number:	4.1.1

REQUIREMENTS:

2005 VVSG Volume I section 4.1.1; Volume II 4.7.1.1
Voting system accuracy addresses the accuracy of data for each of the individual ballot positions that could be selected by a voter, including the positions that are not selected. For a voting system, accuracy is defined as the ability of the system to capture, record, store, consolidate, and report the specific selections and absence of selections, made by the voter for each ballot position without error. Required accuracy is defined in terms of an error rate that for testing purposes represents the maximum number of errors allowed while processing a specified volume of data.

If the system reads at least 1,549,703 consecutive ballot positions correctly, it will be accepted

DESCRIPTION OF ANOMALY:

The system failed to read 1,549,703 consecutive ballot positions correctly. 11 inch ballots were scanned through the OVO and the results did not match the expected results. The test was halted.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer ☐ Wyle	
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: Stephen Han 9/23/13
Representing: N/A	Project Manager: Frank Ritter 9/23/13
Quality Assurance: Michael Cooper 09/23/2013	

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NOTICE OF ANOMALY		DATE: 09/26/2013 ORIGINAL	
Notice No: 11	P.O. Number:	004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number:	T70987.01
Notification Made To: Chris Ortiz		Notification Date:	09/24/2013
Notification Made By: Stephen Han		Via: Email	
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly:	09/24/2013
Part Name: OVO		Part Number:	
Test: Accuracy		Serial/ID Number:	UNI000040 / UNI000044
Specification: 2005 VVSG Volume I		Paragraph/Section Number:	4.1.1

REQUIREMENTS:

2005 VVSG Volume I section 4.1.1; Volume II 4.7.1.1
Voting system accuracy addresses the accuracy of data for each of the individual ballot positions that could be selected by a voter, including the positions that are not selected. For a voting system, accuracy is defined as the ability of the system to capture, record, store, consolidate, and report the specific selections and absence of selections, made by the voter for each ballot position without error. Required accuracy is defined in terms of an error rate that for testing purposes represents the maximum number of errors allowed while processing a specified volume of data.

If the system reads at least 1,549,703 consecutive ballot positions correctly, it will be accepted

DESCRIPTION OF ANOMALY:

The system failed to read 1,549,703 consecutive ballot positions correctly. 14 inch ballots were scanned on UNI000040 and 11 inch ballots were scanned on UNI000044 and the results did not match the expected results. The test was halted.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer ☐ Wyle	
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: Stephen Han 9/26/13
Representing: N/A	Project Manager: Fred Poteet 9/26/13
Quality Assurance: Brenda Mease 9/27/13	

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NOTICE OF ANOMALY	DATE: 09/26/2013 ORIGINAL	
Notice No: 12	P.O. Number: 004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz		Notification Date: 09/23/2013
Notification Made By: Stephen Han		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 09/23/2013
Part Name: OVI-VC 15 inch screen		Part Number:
Test: Acoustic Noise Level and Hearing Aid Compatibility		Serial/ID Number: UNI203066
Specification: 2005 VVSG Volume I		Paragraph/Section Number: 3.2.2.2

REQUIREMENTS: 2005 VVSG Volume I: Section 3.2.2.2; Section 3.1.7.1; RFI 2013-02

The system hardware shall set the initial volume for each voter between 40 and 50 dB SPL. RFI 2013-02 recommends that the initial volume be set between 60-70 dB SPL. The voting machine shall provide a volume control with an adjustable volume from a minimum of 20 dB SPL up to a maximum of 100 dB SPL, in increments no greater than 10 dB.

DESCRIPTION OF ANOMALY:

Wyle engineers performed the Acoustic Noise Level Test and Hearing Aid Compatibility on the OVI-VC. The OVI-VC failed to achieve the required maximum volume of 100 dB SPL. The maximum volume produced was 79 dB SPL.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The test was halted. The final disposition is pending root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer ☐ Wyle	
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: Stephen Han 9/26/13
Representing: N/A	Project Manager: Frank Padilla 9/26/13
Quality Assurance: Brenda Mena 9/27/13	

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NOTICE OF ANOMALY		DATE: 10/07/2013	
Notice No: 13	P.O. Number:	004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number:	T70987.01
Notification Made To: Chris Ortiz		Notification Date:	10/01/2013
Notification Made By: Stephen Han		Via:	Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly:	10/01/2013
Part Name: OVO		Part Number:	
Test: Accuracy		Serial/ID Number:	UNI000044
Specification: 2005 VVSG Volume I		Paragraph/Section Number:	4.1.1

REQUIREMENTS:

2005 VVSG Volume I section 4.1.1; Volume II 4.7.1.1
Voting system accuracy addresses the accuracy of data for each of the individual ballot positions that could be selected by a voter, including the positions that are not selected. For a voting system, accuracy is defined as the ability of the system to capture, record, store, consolidate, and report the specific selections and absence of selections, made by the voter for each ballot position without error. Required accuracy is defined in terms of an error rate that for testing purposes represents the maximum number of errors allowed while processing a specified volume of data.

If the system reads at least 1,549,703 consecutive ballot positions correctly, it will be accepted

DESCRIPTION OF ANOMALY:

The system failed to read 1,549,703 consecutive ballot positions correctly. 14 inch ballots were scanned in UNI000044 and the results did not match the expected results. The test was halted.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes	☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21		☐ Customer	☐ Wyle
CAR Required: ☐Yes ☒No	CAR Number:		

VERFICATION

Test Witness: None	Project Engineer: Stephen Han 10/7/13
Representing: N/A	Project Manager: Fred Vachet 10/7/13
Quality Assurance: John Cooper 10/10/2013	

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NOTICE OF ANOMALY	DATE: 10/11/2013 ORIGINAL	
Notice No: 14	P.O. Number: 004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz		Notification Date: 10/10/2013
Notification Made By: Stephen Han		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 10/10/2013
Part Name: OVO		Part Number:
Test: Accuracy		Serial/ID Number: UNI000041
Specification: 2005 VVSG Volume I		Paragraph/Section Number: 4.1.1

REQUIREMENTS:

2005 VVSG Volume I section 4.1.1; Volume II 4.7.1.1
Voting system accuracy addresses the accuracy of data for each of the individual ballot positions that could be selected by a voter, including the positions that are not selected. For a voting system, accuracy is defined as the ability of the system to capture, record, store, consolidate, and report the specific selections and absence of selections, made by the voter for each ballot position without error. Required accuracy is defined in terms of an error rate that for testing purposes represents the maximum number of errors allowed while processing a specified volume of data.

If the system reads at least 1,549,703 consecutive ballot positions correctly, it will be accepted

DESCRIPTION OF ANOMALY:

OVO test unit UNI000041 failed to read the 11 inch ballots consistently. The 11 inch ballots were rejected as invalid. The test was halted.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer ☐ Wyle	
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: Steph H 10/11/13
Representing: N/A	Project Manager: Frank Rabat 10/11/13
Quality Assurance: Michael Cope 10/11/13	

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NOTICE OF ANOMALY	DATE: 10/14/2013 ORIGINAL	
Notice No: 15	P.O. Number: 004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz		Notification Date: 10/12/2013
Notification Made By: Stephen Han		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 10/12/2013
Part Name: OVO		Part Number:
Test: System Integration		Serial/ID Number: UNI000006
Specification: 2005 VVSG Volume II		Paragraph/Section Number: 6.2.1

REQUIREMENTS:

2005 VVSG Volume II section 6.2.1

The accredited test lab shall design and perform procedures that test the voting system capabilities for the system as a whole. These procedures follow the testing of the systems hardware and software, and address voting system requirements defined in Volume I, Sections 2, 4, 5 and 6.

DESCRIPTION OF ANOMALY:

During the System integration test, the ballots that were printed by the OVI (UNI203050) for the Gen-01 election could not be read by the OVO (UNI000006). The test was halted.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer	☐ Wyle
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: Stephen H 10/14/13
Representing: N/A	Project Manager: Paul Pabst 10/14/13
Quality Assurance: Mike Cooper 10/14/2013	

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NOTICE OF ANOMALY	DATE: 10/22/2013 ORIGINAL	
Notice No: 16	P.O. Number: 004002	Contact No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz		Notification Date: 10/22/2013
Notification Made By: Alan Simmons		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 09/05/2013
Part Name: OVO		Part Number: N/A
Test: TDP Review		Serial/ID Number: N/A
Specification: 2005 VVSG Volume I		Paragraph/Section Number: Section 2

REQUIREMENTS:

The Unysin Open Elect 1.2 Voting System Technical Data Package (TDP) shall be reviewed for accuracy, completeness, and compliance to the EAC 2005 VVSG.

DESCRIPTION OF ANOMALY:

Review of the summited documentation revealed discrepancies between the TDP and the EAC 2005 VVSG requirements. Functional testing also identified text in the TDP that conflicted with the actual operations of the system. Each noted discrepancy was documented in detail in the Wyle generated TDP issues matrix that is on file as raw data.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

Open Elect 1.2 is a Modification of a previously certified system. As such the TDP was only reviewed where modified or where impacted by system modification. Unisyn corrected each nonconformance observation and resubmitted the associated documents for review. This process continued until it appeared that the TDP complied with all applicable requirements.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer	☐ Wyle
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: 10-22-13
Representing: N/A	Project Manager: 10-22-13
Quality Assurance: 10/22/13	

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NOTICE OF ANOMALY	DATE: 10/23/2013 ORIGINAL	
Notice No: 17	P.O. Number: 004002	Contract No: N/A
Customer: Unisyn		Wyle Job Number: T70987.01
Notification Made To: Chris Ortiz		Notification Date: 10/23/2013
Notification Made By: Stephen Han		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 09/27/2013
Part Name: OVS 1.2		Part Number: N/A
Test: Functional Configuration Audit		Serial/ID Number: N/A
Specification: 2005 VVSG Volume II		Paragraph/Section Number: Section 6.7

REQUIREMENTS:

A Functional Configuration Audit (FCA) of the EMS v4.14 shall be performed in accordance with Section 6.7 of Volume II of the VVSG. The purpose of the FCA is to verify that the OVS 1.2 performs as documented in the Unisyn-supplied technical documentation during the OVS 1.2 test campaign.

DESCRIPTION OF ANOMALY:

During performance of the FCA, issues were noted related to system functionality.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

A report of all identified issues was sent to Unisyn for resolution. Unisyn then corrected all noted issues and the tests were repeated with no anomalies.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer	☐ Wyle
CAR Required: ☐Yes ☒No	CAR Number: N/A	

VERFICATION

Test Witness: N/A	Project Engineer: Stephen Han 10/23/13
Representing: N/A	Project Manager: Frank Packard 10/23/13
Quality Assurance: Richard Cooper 10/28/2013	

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