2.0 EQUIPMENT UNDER TEST IDENTIFICATION

The materials required for certification testing of the Unisyn OVS, Version 1.1, which include software, hardware, test materials, and deliverable materials were shipped directly to Wyle by Unisyn with the exception of the OVCS high speed scanner which was shipped to Wyle by VisionShape, Inc. When possible, the equipment used during this test effort was the same equipment used during the original certification campaign performed by Wyle.

Full descriptions of the equipment tested are presented in the "As-Run" Test Plan located in Appendix D of this report.

2.1 Software

Table 2-1 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.

Table 2-1 Software Submitted for Testing

Software Required For Testing	Software Version
Proprietary Software	
Adjudicator	1.1.0
Ballot Layout Manager	1.1.0
Common (Library)	1.1.0
Election Manager	1.1.0
Election Server	1.1.0
OCS Installer	1.1.0
Regkey Builder	1.1.0
Software Server	1.1.0
Tabulator	1.1.0
Tabulator Client	1.1.0
Tabulator Reports	1.1.0
OVCS Application	1.1.0
OVI Firmware	1.1.0
OVO Firmware	1.1.0
Scripter	1.1.0
Validator	1.1.0
Logger (Library)	1.1.0
COTS Software	
CentOS Linux	5.7
Java JRE + Unlimited Cryptographic Extension	1.6.0_02
Apache-Tomcat Application Server	6.0.13
My SQL Data base (BLM, EM, and Tab only)	5.0.45-7
JasperReports	2.0.5

2.0 EQUIPMENT UNDER TEST IDENTIFICATION (Continued)

2.2 Hardware

The equipment the manufacturer submitted for testing is listed in Table 2-2. 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 was made to verify 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 2-2 Test Equipment

Equipment	Description	Serial Numbers
Proprietary Hardware		
OVO 1	Model: OpenElect Voting Optical, Rev. E Firmware Version 1.1.0	UNI000036
OVO 2	Model: OpenElect Voting Optical, Rev. E Firmware Version 1.1.0	UNI000029
OVO 3	Model: OpenElect Voting Optical, Rev. E Firmware Version 1.1.0	UNI000044
OVO 4	Model: OpenElect Voting Optical, Rev. E Firmware Version 1.1.0	UNI000039
OVI 1	Model: OpenElect Voting Interface, Rev. F Firmware Version 1.1.0	UNI150037
OVI 2	Model: OpenElect Voting Interface, Rev. F Firmware Version 1.1.0	UNI150049
OVI 3	Model: OpenElect Voting Interface, Rev. A Firmware Version 1.1.0	UNI150012
COTS Hardware		
EMS PC	Dell Precision T3500 (with all EMS applications installed)	3Y20ZQ1
OVCS High Speed Scanner	Canon ImageFormula DR-X10C	ED300631
UPS	Minuteman Entrust Series ETR1500	AE580906PA114, AE580906PA106
Headphones	Koss KPH5 Stereo Headphones	HP-T58650-001 and -002
Gigabit LAN Switch	Linksys SR2024 Business Series 24-Port 10/100/1000 Gigabit Switch	REM30H600558 GGR1807 JJ

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2.0 EQUIPMENT UNDER TEST IDENTIFICATION (Continued)

2.3 Test Tools/Material

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

Table 2-3 Test Tools/Materials

Test Material	Quantity
Software tools (i.e. ExamDiff Pro for source code analysis)	as required
Elections	2
WoP's	18 (not including secondary WoPs)
Miscellaneous Office equipment and supplies (such as report paper)	as required
Printer Thermal Paper Rolls	as required
External DVD-ROM Drive	1
Printed Ballots	as required

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3.0 CERTIFICATION 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 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 Certification Test Process

3.1.1 Requirements

All testing performed as part of the test effort was performed at the Wyle Labs Huntsville, AL, facility. Testing was limited to the Unisyn OVS, Version 1.1, which includes items listed in Section 2.0 of this report.

The strategy for evaluating the Unisyn OVS, Version 1.1 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.

3.1.2 Hardware Configuration and Design

The submitted hardware changes for this test campaign are documented in Section 3.2. Wyle Laboratories has conducted an engineering analysis of the system performance characteristics in accordance with Volume II, Appendix A, Section 4.3.1 of the 2005 VVSG and determined that the best approach to verifying that the proposed alternative RAM memory modules were electronically and mechanically interchangeable with the existing RAM module was to perform an Electromagnetic Radiation Analysis and compare the electronic signatures of a baseline OVO, versus the electronic signatures of an OVO with each new memory module installed.

Hardware testing of the 15-inch OVI touchscreen consisted of four operational EMI tests and one non-operational hardware test. These tests were Electromagnetic Radiation, Electrostatic Disruption, Electromagnetic Susceptibility, Conducted RF Immunity, and Vibration.

For the Functional Configuration Audit (FCA) and the Accuracy Test, the EMS Version 1.1 was loaded on the COTS desktop computer with a COTS scanner attached to the EMS. The OVO was configured with Firmware Version 1.1. Two OVO units were used during system level testing. The OVI was configured with Firmware Version 1.1. Two OVI units were used during system level testing. For hardware testing, including EMI and Vibration tests, a single OVI unit was used.

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3.0 CERTIFICATION TEST BACKGROUND (Continued)

3.1 Certification Test Process (Continued)

3.1.3 Software System Functions

For this test campaign, Wyle used automated tools as well as a manual review of changed headers to review the source code of the Unisyn OVS 1.1. An engineering decision was made to exceed the 5% minimum value recommended by Wyle in the Automated Review and review a total of 7% for manually. The automated tool used was the Eclipse Integrated Development Environment (IDE) running the source code analyzer plug-in Checkstyle, with all JavaDocs coding standards turned on. The manufacturer submitted Java Coding Conventions published industry-accepted documentation (per RFI 2010-02 -- EAC Decision on Coding Conventions) was evaluated for all existing requirements contained therein. The automated tool was evaluated as to its enforcement of the requirements discovered. Upon completion of the source code review, the usage of automated tools was reviewed to assess their performance regarding the enforcement of the chosen understandability, maintainability, consistency, and documentation of the code in general and of the header content specifically.

The submitted changes for this test campaign are documented in Section 3.2. The new feature and modification were tested using "Regression testing." Regression testing was used to ensure the modification did not introduce any defects into unchanged areas. Wyle used partial regression testing to test the elements that directly interact at both the Component and Integration Levels of testing.

The strategy for evaluating the depth of regression testing was to review the source code modifications during the source code review. Minor enhancements to variables, input fields, and restrictions were tested by inputting both valid and invalid data into the system. The Adjudicator application was tested by performance of a Functional Configuration Audit during which the new functionality was exercised to verify correct operation. After the Adjudicator application and the enhancements to the system were tested on a component level a full system level test was performed to ensure all interacting components functioned as a system without issues.

3.2 Scope of Testing

As stated previously, versions of this system, Unisyn OVS, Versions 1.0 and 1.0.1, have been fully tested to the EAC 2005 VVSG. As a result of this testing, Unisyn OVS Versions 1.0 and 1.0.1 were granted certification under EAC Certification Nos. UNS10121966-OE and UNS10121966-OE-WI. Since that time, Unisyn Voting Solutions has incorporated modifications and hardware changes to the certified 1.0 system, resulting in the release of the Unisyn OVS, Version 1.1. These modifications are detailed in the following subsections.

Due to the modifications and enhancements made, Wyle determined that the following tests would be performed:

- Source code review in accordance with 2005 EAC VVSG.
- Technical Data Package review to ensure all modifications are documented as applicable.
- A focused Physical Configuration Audit (PCA) to baseline the modified system.
- Security test to verify that no security vulnerabilities are introduced by the modifications to the system or the addition of the Adjudicator application.
- Functional Configuration Audit of the new features and enhancements made to the voting system.
- All functionality performed by new or modified subsystems/modules.

3.0 CERTIFICATION TEST BACKGROUND (Continued)

3.2 Scope of Testing (Continued)

- Accuracy test to verify that the system modifications do not impact the accuracy of the system.
- Volume and Stress tests of the OVO to verify that the system modifications do not impact the system's ability to process large amounts of voting data.
- EMI Testing of the 15-inch OVI touchscreen by performing the following EMI tests: Electromagnetic Radiation test, Electrostatic Discharge test, Electromagnetic Susceptibility test and Conducted RF Immunity test.
- Usability and Accessibility test to verify that the 15-inch OVI screen conforms to Usability and Accessibility requirements.

3.2.1 Enhancements

Enhancements have been implemented in the Unisyn OVS Version 1.1. These include enhancements to individual applications or components, multiple components, and security enhancements. A list of these enhancements, the respective components to which they apply, and the test that each was verified in, is provided below.

Table 3-1 Enhancements

Item	Description	Test
E-01	Support for multi-page ballots added. The system supports up to three single or double sided pages.	FCA, Accuracy Test
E-02	The manufacturers ID on USB drives are no longer being validated.	PCA, FCA
E-03	The Tabulator application now supports N of M voting in Ranked Choice Voting contests.	FCA
E-04	Operating system in now installed/created using the default CentOS distribution and Unisyn's configuration files on a USB drive.	PCA
E-05	OVO and OVCS driver updates.	Compliance Build, Trusted Build
E-06	The system functionality has been expanded to support the following ballot lengths: 11, 14, 17, 19 & 21 inch.	FCA
E-07	Screen Calibration is now a selectable option on the OVO and OVI interface.	FCA
E-08	In the EM application, an option can be set for the election which will cause ballot alerts to display on the OVO screen during voting.	FCA
E-09	Support for single sided ballots has been added to the BLM application.	FCA
E-10	The BLM application allows the user to manage the length of the stub at the top of printed paper ballots.	FCA
E-11	In the BLM application, multiple font sizes are available for printing and display of candidates on the ballot.	FCA
E-12	In the BLM application, party icons can now be placed next to candidates on the ballot.	FCA

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3.0 CERTIFICATION TEST BACKGROUND (Continued)

3.2 Scope of Testing (Continued)

3.2.1 Enhancements (Continued)

Table 3-1 Enhancements (Continued)

Item	Description	Test
E-13	Measures can extend the full width of the ballot page, in the BLM application.	FCA
E-14	In the BLM application, additional text can now be added under the "Vote For" text in a contest header.	FCA
E-15	The BLM application validates that the selected font sizes fit in the available space on the ballot. This is a background process.	FCA
E-16	The BLM application can create sample ballots which contain no barcodes or timing marks and have the word "Sample" down the middle of the ballot.	FCA
E-17	In the BLM application, blank space can be inserted between contests on the ballot.	FCA
E-18	The height of the ballot header can be set as 1" or 2".	FCA
E-19	Grey vote selection boxes are now supported by the system.	FCA
E-20	In the BLM application, candidates can be setup so that they take up multiple ¼" spaces on the ballot.	FCA
E-21	An increased amount of text is allowed in the contest headers, depending on size and font, when laying out a contest in the BLM application.	FCA
E-22	A user with proper permissions can remove an uploaded OVO or OVCS session from a Run, in the Tabulator application.	FCA
E-23	In the Tabulator application, valid write-in candidates can be added to a contest, so that votes can be assigned to the candidate through adjudication.	FCA
E-24	More detail has been added on upload, to show precincts that have and have not been uploaded, in the Tabulator application.	FCA
E-25	A Precinct Summary report has been added to the Tabulator Reports application. The Precinct summary can be displayed and printed as an official or unofficial report.	FCA
E-26	MySQL logs that reach a certain size are closed and new ones are created.	PCA, Security

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3.0 CERTIFICATION TEST BACKGROUND (Continued)

3.2 Scope of Testing (Continued)

3.2.1 Enhancements (Continued)

Table 3-1 Enhancements (Continued)

Item	Description	Test
E-28	Print notification security update to the OCS operating system.	FCA, Security
E-29	Intrusion detection security update to the OCS operating system.	FCA, Security
E-30	Software packages included in the CentOS operating system will be upgraded to protect against security vulnerabilities.	FCA, Security
E-31	OCS applications archive audit log entries 22 months or older. The entries are placed in a PDF file then removed from the database.	FCA
E-32	The OVO can export ballot page images to the TM for use in adjudication. This functionality is available from the Maintenance menu.	FCA, Accuracy
E-33	Political party icons can be displayed on the OVI screen while voting.	FCA
E-34	The OVCS displays which ballot in a sequence of ballots fed into the OVCS, is invalid.	FCA
E-35	EM can now export elections that contain multiple customer keys.	FCA
E-36	An expiration date has been added to registration keys, for licensing purposes.	FCA, Security
E-37	Registration Key validation has been added to the OCSInstaller application.	PCA, Security
E-38	A TOC (validation file) is created for each OCS application on install, so that the OCS applications can validate themselves each time the application is opened.	PCA, Security
E-39	After 24 months, the system releases old unused passwords so they can be reused.	FCA, Security
E-40	Adjudicator application has been added as a component of the system.	FCA, System Integration
E-41	Candidate rotation by party within a contest.	FCA
E-42	Overvotes can now be calculated based upon voter count as opposed to the "Vote For" value of the contest. E.g. In a vote for 3 contests, the number of overvotes would be 1.	FCA
E-43	Elections can be exported from the EM application without sounds.	FCA
E-44	A Ballots.csv file is created when the Election XML is exported from the BLM application. The file contains information about the election ballots and can be used for ordering ballots.	FCA
E-45	Vote-By-Ballotstyle processing has been added to the OVO and OVCS. This process allows jurisdictions to create general ballot style ballots which can be used for multiple precincts.	FCA

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3.0 CERTIFICATION TEST BACKGROUND (Continued))

3.2 Scope of Testing (Continued)

3.2.2 Hardware

Unisyn incorporated various hardware changes into the previously-certified versions of this system (Versions 1.0 and 1.0.1). These changes are fully implemented in the current test campaign for version 1.1. These changes were submitted by Unisyn to Wyle for evaluation and are detailed in the following types of Unisyn documents: Engineering Change Orders (ECO's), Engineering Approval Changes (EAC's), an Initial Release (IR), and a Configuration File Approval Change (CFAC). Each modification was deemed by Wyle to be De Minimis and was accepted as such by the EAC. The changes included: new headphones, new Transport Media, an updated power supply due to labeling changes, two new RAM modules, and a 15-inch screen for use in OVI units, and a configuration file change made to enhance the system as well as qualifying alternative components for use in the OVO and OVI units.

Additionally, Unisyn added a new model of personal computer for the Election Management System. The introduction of the alternative RAM modules necessitates the performance of an Electromagnetic Radiation Analysis to determine what effect the hardware change had on the OVO unit's electronic signature. The introduction of the 15-inch screen required functional, usability, accessibility and abbreviated EMI testing to verify that the modification did not negatively impact system performance.

These hardware updates and enhancements, along with the corresponding document number, are listed below.

EAC 1002 – The part number of an AC/DC Adapter used in the OVO units has been changed by the manufacturer. The part number of the Eurasia STD-2412P (RoHS/CEC) 30w Switching Power Adapter used in OVO units has been changed to UA30-1024 by the manufacturer.

EAC 1004 – The 24V DC Universal Power supply manufactured by Star Micronics has undergone some labeling changes to meet regulatory and safety standards. The first labeling change has resulted in a part number change from 30781751 to 30781752. The second labeling change has resulted in a part number change from 3078172 to 30781753.

The Koss KPH5 stereo headphones are being introduced as a replacement for the Sony MDR-210 LP headphones currently used with OVI units.

The Delkin Devices US01GISPP-XX000-D 1GB Industrial USB Flash Drive is being introduced as an alternative to the STEC SLUFD1GU2U 1GB Industrial USB Flash Drive currently used in OVO and OVI units.

Two alternative RAM memory modules are being introduced for use in OVO units. These memory modules are the Innodisk M2UK-1GPCQCH4-D 1GB RAM module and the Dataram DTM63323D 1GB RAM module.

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3.0 CERTIFICATION TEST BACKGROUND (Continued)

3.2 Scope of Testing (Continued)

3.2.2 Hardware (Continued)

EAC 1005 – The thermal head of the Star Micronics TSP700II thermal printer used in the OVI has been updated. This resulted in the manufacturer changing the part number of the thermal head from 37469060 to 37469061. The cutter unit of the TSP700II was also updated. This resulted in the manufacturer changing the part number of the cutter unit from 37970000 to 37981240.

EAC 1006 – The cutter unit of the Star Micronics TSP700II thermal printer used in the OVI has been updated. This resulted in the manufacturer changing the part number of the cutter unit from 37981240 to 37981241.

EAC 1007 – The STEC SLUFD1GU2TU 1GB Industrial USB Flash Drive and the Delkin Devices UV0GSAXSY-XN000-D 1GB Industrial USB Flash Drive are being introduced as alternatives to the STEC SLUFD1GU2U 1GB Industrial USB Flash Drive currently used in OVO and OVI units.

EAC 1008 – The Seasonic SSA-0901-12 Universal AC Power Adapter is being introduced as an alternative to the MGP F10903-C Universal AC Power Adapter used to power the PC and Display in OVO and OVI units.

EAC 1009 – The Western Digital WD3200AAKX 320GB SATA hard drive is being introduced as an alternative to the Western Digital WD3200AAJS 320GB SATA hard drive currently used in OVO and OVI units.

ECO 16865 – This ECO adds the EAC Certification Label to the build of materials (BOM) for both the OVO and the OVI. The Shipping Carton has also been added to the build of materials (BOM) of the OVO.

ECO 16869 – The Jetway J7F2WE1G5S-OC-LF 1.5GHz motherboard and processor previously introduced for use in the OVO may now be used in the OVI as well.

ECO 16870 – This ECO includes changes to the OVO scanner mounting plate to improve clearances and remedy a mismatched hole, changes in the clearance hole for the RJ-45 connector, improvements to the dimensions for the lock cam, and a change to the labeling of the LCD Touchscreen.

ECO 16871 – Spacers located between the OVI motherboard and the OVI PC Case have been removed.

ECO 16877 – This ECO adds an additional ballot box for use with the OVS.

IR 00515 – The OVI PC box was changed to accommodate the motherboard connector faceplate, as the PC box cutout did not correctly align with the connector faceplate. This change accompanies ECO 16871 listed above.

IR 00552 – Added 15-inch screen to the OVI.

CFAC 1001 – The xorg.conf configuration file has been edited to simulate the generic Linux video driver (VESA) and force a screen resolution of 800x600.

4.0 TEST FINDINGS AND RECOMMENDATIONS

4.1 Summary Findings

The results of the hardware analysis, system level testing, source code review, and technical data package review performed on the Unisyn OpenElect Voting System Version 1.1 as required by this test effort are summarized in the following paragraphs.

4.1.1 Hardware Testing

An engineering analysis, conducted by Wyle, of the system performance characteristics in accordance with Volume II, Appendix A, Section 4.3.1 of the 2005 VVSG was used to determine that the best approach to verifying that the proposed alternative RAM memory modules were electronically and mechanically interchangeable with the existing RAM module was to perform an Electromagnetic Radiation Analysis and compare the electronic signatures of a baseline OVO, versus the electronic signatures of an OVO with each new memory module installed.

Additionally, limited hardware testing was performed due to the addition of 15-inch OVI touchscreen (Electromagnetic Radiation, Electrostatic Disruption, Electromagnetic Susceptibility, Conducted RF Immunity, and Vibration) and the evaluation of ECO 16877 (adding the alternate ballot box for the OVO) required the performance of a Vibration Test.

4.1.1.1 Electromagnetic Radiation Analysis

The Unisyn OVO was subjected to an Electromagnetic Radiation Analysis. The following paragraphs describe how the Electromagnetic Radiation Analysis was performed as well as the results of the analysis.

The Electromagnetic Radiation Analysis was performed by Wyle in a semi-anechoic chamber. The antennas used for testing were placed at a distance of one meter from the OVO unit being analyzed. Wyle utilized a logarithmic antenna on both vertical and horizontal planes, to perform the analysis. The OVO unit was configured to run in auto feed mode, where continual ballot processing would occur during the analysis.

For the first scan, OVO unit UNI000004 was loaded with Firmware Version 1.0.1 and an election used during the original EAC Certification effort. The Jetway 1.5GHz rev 4.0 Model Number J7F2WE1G5S-OC-LF motherboard and integrated processor was installed in the unit. A "Pre-Operational Status Check" was performed, after which the unit was placed in the chamber and set to auto feed mode. Electromagnetic Radiation scans were performed while the unit was actively scanning ballots.

For the second scan, the Jetway 2GHz rev 4.0 model number J7F2WE2GS-OC-LF motherboard and integrated processor were installed into OVO unit UNI000004. The OVO was loaded with firmware version 1.0.1 and an election used during the original EAC Certification effort and set to auto feed mode. Electromagnetic Radiation scans were performed while the unit was actively scanning ballots. At the conclusion of the Electromagnetic Radiation scans, the unit was subjected to a "Post-Operational Status Check."

Summary Findings: The two scans provided Wyle with enough data to make the assessment that the hardware update was not significant and to suggest that the change be considered minor. Wyle believes that this change maintains and does not alter the reliability, functionality, capability and operability of the system. The Electromagnetic Radiation analysis demonstrated that the replacement hardware has the same functionality and is electronically and mechanically interchangeable with the old hardware. The results of the Electromagnetic Radiation Analysis Scans are presented in Appendix E.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued))

4.1 Summary Findings (Continued)

4.1.1 Hardware Analysis (Continued)

4.1.1.2 Electromagnetic Radiation Emissions

Electromagnetic Radiation Emissions testing was performed in accordance with Section 4.8 of Volume II of the VVSG. This testing was performed to ensure that emissions emanating from the unit do not exceed the limits of 47 CFR Part 15, Subpart B, Class B Limits. The Unisyn OVI was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing. The Unisyn OVI was subjected to the test requirements detailed in Table 4-1.

Table 4-1 Conducted and Radiated Emissions Requirements

Conducted Emissions			Radiated Emissions	
Frequency Range (MHz)	Limits (dBµV)		Frequency Range (MHz)	3 Meter Test Limit (dBµV)
	Quasi-peak	Average		
0.15 to 0.50	66 to 56	56 to 46	30 to 88	40.0
0.50 to 5.0	56	46	88 to 216	43.5
5.0 to 30.0	60	50	216 to 960	46.0
			960 to 1000	54.0

Testing was performed at the Wyle Laboratories' Open Air Test Site 2 (OATS-2) located on the Intergraph Complex in Huntsville, AL. The OATS-2 is fully described in reports provided to the Federal Communication Commission (FCC) (FCC Reference 98597). The site was tested and complies with the requirements of ANSI C63.4-2003.

To perform the Conducted Emissions portion of the test, the Unisyn OVI was set up as depicted in Figure 4-1.

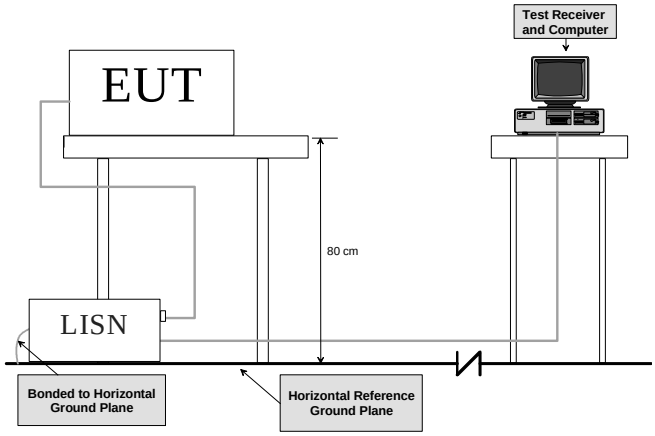

Figure 4-1 Conducted Emissions Test Setup

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued))

4.1 Summary Findings (Continued)

4.1.1 Hardware Analysis (Continued)

4.1.1.2 Electromagnetic Radiation Emissions (Continued)

The Unisyn OVI was then subjected to the following test procedure:

1. The Unisyn OVI was placed on the reference ground plane at the Open-Area Test Site.
2. The Unisyn OVI AC/DC Power Adapter was connected to the power mains through a Line Impedance Stabilization Network (LISN). Other support units were connected to the power mains through another LISN. The LISNs provided 50 ohm/50 µH of coupling impedance for the measuring instrument.
3. The Unisyn OVI was placed in an active state and monitored for functionality throughout testing.
4. Both Line and Neutral of the power mains connected to Unisyn OVI were checked for maximum conducted interference.
5. The frequency range from 150 kHz to 30 MHz was evaluated and recorded. Emissions levels below – 20 dB were not recorded.

To perform the Radiated Emissions portion of the test, the Unisyn OVI was set up as depicted in Figure 4-2.

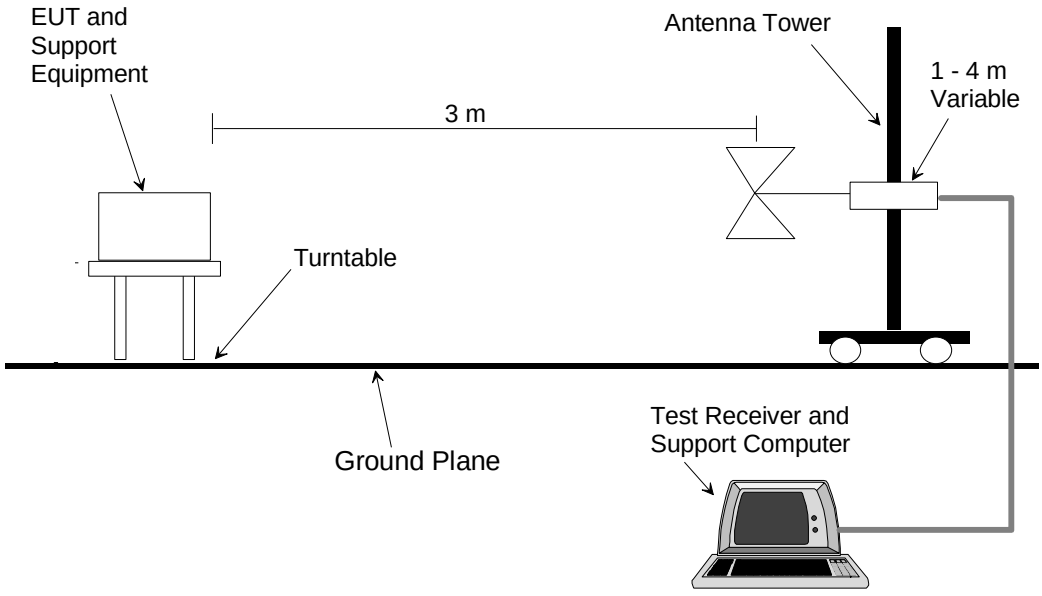

Figure 4-2 Radiated Emissions Test Setup

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued))

4.1 Summary Findings (Continued)

4.1.1 Hardware Analysis (Continued)

4.1.1.2 Electromagnetic Radiation Emissions (Continued)

The Unisyn OVI was then subjected to the following test procedure:

1. The Unisyn OVI was placed on the reference ground plane at the Open-Area Test Site.
2. The Unisyn OVI was placed 3 meters away from the interference-receiving antenna, which was mounted on a variable-height antenna tower. The interference-receiving antenna used was a broadband antenna.
3. For each suspected emissions point, the Unisyn OVI was arranged in a worst case configuration. The table was rotated from 0 to 360 degrees and the antenna height was varied from one (1) to four (4) meters to identify the maximum reading.
4. All emissions points identified within 20 dB of the specified limit were tested individually using the quasi-peak method as specified and then reported in the tabular data.

The Unisyn OVI was found to comply with the required emissions limits. Photographs of the test setup are contained in Appendix B. The test data sheet and the Instrumentation Equipment Sheet for the test are contained in Appendix C of this report.

4.1.1.3 Electrostatic Disruption Test

Electrostatic Disruption testing was performed in accordance with Section 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 Unisyn OVI 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 Unisyn OVI was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing without operator intervention. The Unisyn OVI and the EMI measuring equipment were then setup per the following conditions:

1. Power lines and power line returns were configured as required by the system configuration.
2. The EUT was raised approximately 10 cm from the ground using isolated stand-offs.

The Unisyn OVI was then subjected to the electrostatic discharge transients listed in Table 4-2. 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. The direct application, air discharge method was selected when applying the Electrostatic Disruption test due to the EUT case being made of plastic. The IEC 61000-4-2, Edition 2.0, 2008-12 states: “In the case of testing equipment with insulating surfaces, the air discharge method with voltages up to 15kV may be used.”

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.1 Summary Findings (Continued)

4.1.1 Hardware Analysis (Continued)

4.1.1.3 Electrostatic Disruption Test (Continued)

Table 4-2 Electrostatic Discharge Transients

	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		%

There was no loss of normal operation or loss of data as a result of the applied discharges.

The Unisyn OVI successfully completed the requirements of the Electrostatic Disruption Test. Photographs of the test setup are contained in Appendix B. The test data sheet and the Instrumentation Equipment Sheet for the test are contained in Appendix C of this report.

4.1.1.4 Electromagnetic Susceptibility Test

Electromagnetic Susceptibility testing was performed in accordance with Section 4.8 of Volume II of the VVSG. This testing was performed to ensure that the Unisyn OVI would be able to withstand a moderate level of ambient electromagnetic fields without disruption of normal operation or loss of data.

The Unisyn OVI was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing without operator intervention. The Unisyn OVI was then subjected to ambient electromagnetic fields at 10 V/m over a range of 80 MHz to 1000 MHz, as shown in Figure 4-3. Testing was conducted utilizing both horizontally and vertically polarized waves. The limits were measured with a maximum scan rate of 1% of the fundamental frequency and the dwell duration was three seconds.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued))

4.1 Summary Findings (Continued)

4.1.1 Hardware Analysis (Continued)

4.1.1.4 Electromagnetic Susceptibility Test (Continued)

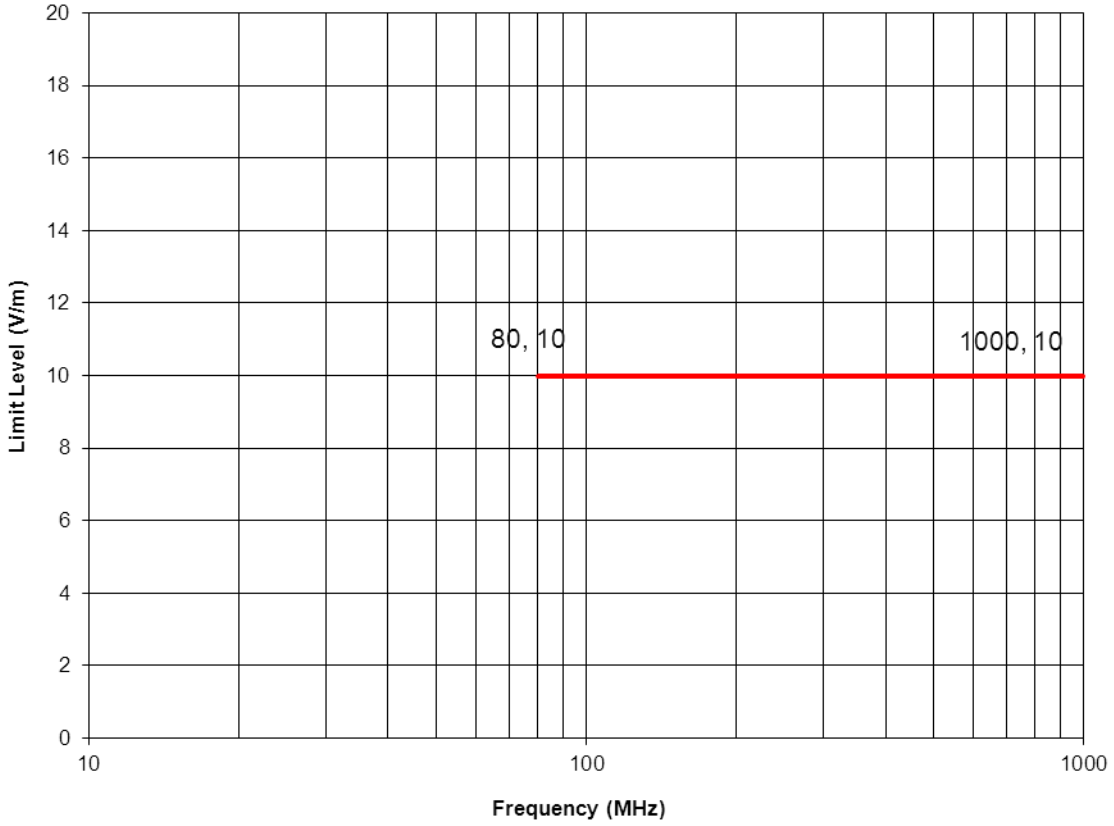

Figure 4-3 Radiated Susceptibility Limit

There was no loss of normal operation or loss of data as a result of the applied electromagnetic fields. The Unisyn OVI successfully completed the requirements of the Electromagnetic Susceptibility Test. Photographs of the test setup are contained in Appendix B. The test data sheet and the Instrumentation Equipment Sheet for the test are contained in Appendix C of this report.

4.1.1.5 Conducted RF Immunity Test

Conducted RF Immunity testing was performed in accordance with Section 4.8 of Volume II of the VVSG. This testing was performed to ensure that the OVI will be able to withstand conducted RF energy onto its power lines without disruption of normal operation or loss of data.

The OVI was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing without operator intervention. The OVI was then subjected to conducted RF energy of 10 Vrms applied to its power lines over a frequency range of 150 kHz to 80 MHz. There was no loss of normal operation or loss of data as a result of the applied conducted RF energy. Photographs of the test setup, the test data sheet, and the Instrumentation Equipment Sheet for the test are contained in Appendix A of this report.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.1 Summary Findings (Continued)

4.1.1 Hardware Analysis (Continued)

4.1.1.6 Vibration Test

The OVI and OVO (mounted on the new ballot box) were subjected to a Vibration Test in accordance with Section 4.6.3 of Volume II of the VVSG. The purpose of this test was to simulate stresses faced during transport of voting machines and ballot counters between storage locations and polling places. This test is equivalent to the procedure of MIL-STD-810D, Method 514.3, Category 1- Basic Transportation, Common Carrier.

Prior to test initiation, the OVI and OVO were subjected to a baseline operability checkout to verify system readiness. Upon completion, the units were secured to an electrodynamics shaker. One control accelerometer was affixed to the shaker table. The units were then subjected to the Basic Transportation, Common Carrier profile as depicted in MIL-STD-810D, Method 514.3, Category I, with a frequency range from 10 Hz to 500 Hz and an overall rms level of 1.04, 0.74, and 0.20 G for duration of 30 minutes in each orthogonal axis.

Upon test completion, each unit was inspected for any obvious signs of degradation and/or damage. None were observed. Post-test operability checkouts were also performed on each unit. No anomalies were observed during the checkout for the OVO; however, it was noted that the touchscreen on the OVI unit was unresponsive. The touchscreen was replaced by the Unisyn Technical Representative and the test was repeated with no anomalies (refer to Notice of Anomaly (NOA) No. 1, presented in Appendix A and Section 4.2, for further details).

Photographs of the test setup are contained in Appendix B. The test data sheet and the Instrumentation Equipment Sheet for the test are contained in Appendix C of this report.

4.1.2 System Level Testing

System level tests were performed to evaluate the integrated operation of the voting system hardware and software. These tests included Volume and Stress Test (with sufficient ballots cast to satisfy the Data Accuracy requirements set forth in the VVSG Volume 2 Section 4.7.1.1) and a Functional Configuration Audit.

4.1.2.1 Volume/ StressTest

The OVS Version 1.1 was subjected to a Volume and Stress Test in accordance with the requirements of Section 6.2.3 of Volume II of the VVSG. The purpose of the test is to investigate the system's response to conditions that tend to overload the system's capacity to process, store, and report data. These tests investigate the system's response to transient overload conditions. Polling place devices shall be subjected to ballot processing at the high volume rates at which the equipment can be operated to evaluate software response to hardware-generated interrupts and wait states.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.1 Summary Findings (Continued)

4.1.2 System Level Testing (Continued)

4.1.2.1 Volume/Stress Test (Continued)

Testing was performed by running a special volume test that would process numerous ballots through the system at higher than expected rate, by utilizing shoe-shine mode of operation, which allowed processing of over 50 ballots per hour. Four OVO's were utilized in this test, and two were set up to run single sided ballots and two were set up to run double sided ballots. 10,000 ballots were scanned through each OVO and the results were verified.

Summary Findings: The Unisyn OVS Version 1.1 successfully processed 40,000 ballots. There was one anomaly on this test , refer to Notice of Anomaly (NOA) No. 4, presented in Appendix A and section 4.2, for further details). Wyle personnel repeated the test on the unit in question, casting an additional 10,000 ballots to demonstrate that the system operated without error.

4.1.2.2 Accuracy Test

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: During the data accuracy test 2 OVO were set up to cast 1,559,400 ballot positions via multiple ballots styles that are supported by the system. During the Accuracy test there were three anomalies recorded, refer to Notices of Anomaly (NOA) Nos. 2, 5, and 6 presented in Appendix A and Section 4.2, for further details). After resolution of these anomalies, the OVO cast and recorded correctly 1,559,400 ballot positions.

4.1.2.3 Functional Configuration Audit

An abbreviated Functional Configuration Audit (FCA) was performed on the Unisyn OVS Version 1.1 in accordance with Section 6.7 of Volume II of the VVSG. The purpose of the FCA was to verify the modification performed as documented in the Unisyn supplied technical documentation and validate that the modifications meet the requirements of the EAC 2005 VVSG.

To perform the FCA, the Unisyn OVS Version 1.1 was subjected to a series of tests to regression test all modifications to the certified system and retest areas around the modification to ensure that those areas continue to function properly. The modifications included the performance enhancements, hardware modifications and added features previously described in Section 3.2 of this report.

Summary Findings: A Functional Configuration Audit of the Unisyn OVO Version 1.1 was performed during which the modification and added functionality operated as described in the system's technical documentation. No anomalies were noted during the performance of the Functional Configuration Audit.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.1 Summary Findings (Continued)

4.1.2 System Level Testing (Continued)

4.1.2.4 Physical Configuration Audit

A focused Physical Configuration Audit (PCA) of the OVS was performed as part of the pre-testing activities 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 purpose of the PCA is to: establish a configuration baseline (both hardware and software) of the system to be tested; verify that the reviewed source code conforms to the vendor's specification; and assess the adequacy of user acceptance test procedures and data.

The PCA performed on the OVS 1.1 consisted of inspecting the following: The OpenElect Voting Central Scan (OVCS) scanner and software application, the OpenElect Voting Optical Scan unit (OVO), and the documentation used with the OVS system.

Summary Findings: A focused PCA was performed to baseline the system's hardware and software components prior to commencement of the test campaign. No discrepancies were noted during the PCA.

4.1.2.5 System Integration 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 1.1. To perform the System Integration Testing, Wyle developed specific procedures and test cases designed to test the system as a whole. These procedures demonstrated compliance of the OVS, Version 1.1, 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:

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

Summary Findings: Through System Integration Testing, it was demonstrated that the system performed as documented with all components performing their intended functions. No anomalies were noted during testing. The individual requirements can be traced in the FCA documentation.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.1 Summary Findings (Continued)

4.1.3 Source Code Review

The source code for the modifications made to the Unisyn OVS Version 1.1 was reviewed for conformance with the requirements set forth in Section 5.4 of the EAC 2005 VVSG coding standards and the vendor supplied coding standards. The review was conducted as part of the pre-testing activities and was performed per the guidelines described in the following paragraphs.

Wyle used the source code from the original EAC Certification effort as a baseline to compare against the modified source code. As source code was received, a SHA1 hash value was created for each source file. The source code team then conducted a visual scan of every line of modified source code. Each identified violation was recorded by making notes of the standard violation along with directory name, file name, and line number.

Summary Findings: The source code review of the Unisyn OVS 1.1 revealed four units called issues and six header revision history issues. A technical summary report of all identified standards violations was sent to Unisyn for resolution. Unisyn then corrected all standards violations and re-submitted the source code for re-review. This process was repeated as many times as necessary until all identified standards violations were corrected. Other than coding standards noted in the technical summary report, no other deficiencies or significant problems were found during the source code review.

4.1.4 Technical Data Package (TDP) Review

The Unisyn Voting Solutions, Inc., OpenElect Voting System Technical Data Package Version 1.1 was reviewed to the 2005 VVSG. This review was performed as part of the pre-testing activities.

Summary Findings: The modified TDP documents were reviewed to ensure that all modifications to the system are described as applicable. 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 all functional tests. The TDP documents reviewed are listed in Table 4-2.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.1 Summary Findings (Continued)

4.1.4 Technical Data Package (TDP) Review (Continued)

Table 4-2 TDP Documents

OVS Release 1.1 TDP Documents	Release	Version	Document Number
System Functionality Description	1.1	1.0	04-00444
Personnel Training and Deployment Requirements	1.1	1.1	04-00445
System Overview	1.1	1.1	04-00446
System Security Specification	1.1	1.2	04-00447
Configuration Management Plan	1.1	1.0	04-00448
System Test and Verification Plan	1.1	1.1	04-00453
Quality Assurance Plan	1.1	1.0	04-00454
System Hardware Specification	1.1	1.1	04-00458
System Maintenance Procedures	1.1	1.0	04-00459
System Operations Procedures: Warehouse Technician's Guide	1.1	1.2	04-00460
System Operations Procedures: Election Day Troubleshooter's Guide OVO and OVI	1.1	1.3	04-00462
System Operations Procedures: Election Day Pollworker's Guide OVO and OVI	1.1	1.2	04-00463
Final Quality Assurance Report	1.1	1.0	04-00469
OVS Acronyms	1.1	1.0	04-00494
Software and Design Specification	1.1	1.6	04-00464
Election Manager User Guide	1.1	1.1	04-00427
Ballot Layout Manager User Guide	1.1	1.3	04-00428
Election Server User Guide	1.1	1.0	04-00429
Software Server User Guide	1.1	1.0	04-00430
Tabulator Client User Guide	1.1	1.1	04-00431
Tabulator User Guide	1.1	1.3	04-00432
Tabulator Reports User Guide	1.1	1.0	04-00433
OVCS User Guide	1.1	1.1	04-00495
Adjudicator User Guide	1.1	1.2	04-00530
EOS Trusted Build Document	1.1	1.3	04-00525
EOS Linux Installation	1.1	1.0	04-00549
Trusted Build – Applications 1.1	1.1	1.6	04-00553
OVO Trusted Build Document 1.1	1.1	1.3	04-00554
OVI Trusted Build Document 1.1	1.1	1.0	04-00555

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.1 Summary Findings (Continued)

4.1.4 Technical Data Package (TDP) Review (Continued)

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.

4.1.5 Security

A Security Test which focused on the functional changes to the security of the OVS was performed as part of the Unisyn OVS 1.1 test campaign. The Security Tests were performed to verify that the security enhancements added to the system did not compromise the security of the system. A few examples of the security enhancements are: MYSQL log rotation, intrusion detection, and the freeing up of old unused OCS passwords after a period of 24 months has passed.

The Security Test performed on the OVS 1.1 consisted of performing test cases designed to test the Security Enhancements made to the system.

Summary Findings: A limited Security Test was performed to verify that security enhancements to the system did not compromise the system's security. No discrepancies were noted during the Security Test.

4.1.6 Usability and Accessibility

A Usability and Accessibility Test which focused on the functional changes to the system was performed as part of the Unisyn OVS 1.1 test campaign. The addition of the 15-inch OVI touchscreen as an option necessitated the performance of a limited Usability and Accessibility Test to determine if the new touchscreen complied with applicable Usability and Accessibility requirements.

The Usability and Accessibility Test performed on the OVS 1.1 consisted of executing Usability and Accessibility test cases which addressed the affected Usability and Accessibility requirements.

Summary Findings: A limited Usability and Accessibility Test was performed on the 15" OVI unit. Testing determined that the introduction of the 15" OVI touchscreen as a hardware option did not affect the Usability and Accessibility of the system. No discrepancies were noted during the Usability and Accessibility Test.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.2 Anomalies and Resolutions

A total of ten 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 certification testing were successfully resolved prior to test completion. The Notices of Anomaly generated during testing are presented in their entirety in Appendix A and are summarized in the following paragraphs.

Notice of Anomaly No. 1: Transportation Vibration.
After vibration test was completed on 11-14-11 the OVI was subjected to a post-test operational status check. During the check, it was noted that the touchscreen was unresponsive.

Resolution to Anomaly No. 1:
The ILTS/Unisyn Technical Representative replaced the touchscreen with a new screen and the test was repeated on November 17, 2011, with no anomalies noted. Upon inspection of the original screen, the ILTS/Unisyn Technical Representative noted that loose internal components may have been a factor in the failure; however, a definitive point of failure was not determined.

Notice of Anomaly No. 2: Data Accuracy Test.
During the 5th run on OVO S/N UNI000029 the unit displayed a 940 error and displayed a system message: Failure to cast ballot page; please call technical support. The ballot was returned to the person casting the ballot. Due to the error condition at this time, there was no way to determine if the ballot had been cast or not. Test was halted.

Resolution to Anomaly No. 2:
ILTS/Unisyn provided a comprehensive write up on the issue to Wyle and EAC. The change required an update to the source code to change how the error was handled. This change was verified by Wyle personnel in a source code review. Unisyn also updated their TDP to include instructions, to the poll worker, on the proper actions to perform incase this error occurs. In addition, Unisyn added an explanation about how error code 945 is processed. The test was then repeated and no anomalies of this type were recorded. This anomaly was not observed in any other testing event during the test campaign.

Notice of Anomaly No. 3: Data Accuracy Test
OVO S/N UNI000039 successfully completed the Volume and Stress election portion of the Accuracy Test. However, during the 2nd cycle of the 11" Single Sided 3-Page Ballot election, the unit displayed the Unisyn Voting Solutions screen while casting a ballot. The touchscreen was unresponsive and the ballot scanner stopped accepting ballots. Due to the fact that similar behavior was seen during the prior Accuracy Test on 12/29/2011, the test was halted. Upon reboot it was determined that the system recovered successfully and the ballot page count was correct. The results and images were sent to Unisyn for analysis. Unisyn's analysis found that there was a conflict between the PDI software driver for the Scanner and the Unisyn proprietary code. Unisyn worked with PDI, who provided an updated software release to Unisyn. Unisyn also added validations in their system to record this error to ensure it would be properly documented. Unisyn thoroughly tested this update and provided Wyle with their test cases and results. Wyle set up 4 OVO's in test loaded with the updated software and cast 10,000 ballots on each unit. This anomaly did not repeat and all results were recorded accurately.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.2 Anomalies and Resolutions (Continued)

Notice of Anomaly No. 4: Volume Test
OVO S/N UNI000029 was set up to cast ballots in shoeshine mode on 2-13-12 to ensure that the Unisyn memory leak and JVM issues (Unisyn screen lock up) were successfully resolved. After the first run of 5,000 ballots shoeshined a results tally was pulled and it was discovered that there was 1 undervote for the presidential race. The other races results were completely accurate. Visual examination of the physical ballot revealed heavy marking along the timing marks along the left side of the ballot. The ballot in question was utilized in the shoeshine for over 1,000 voting events. The results and images were sent to Unisyn for analysis. Unisyn's analysis found that the image for the ballot in question had severe black markings along the timing mark next to the presidential contest. This caused the system to not recognize that a mark was present in this location. Wyle believed that the overuse of the ballot in question directly led to the timing mark section of the ballot being too dark to be read accurately. This was resolved by changing out the ballot more frequently and not allowing a buildup in makrings on the test ballots. The second run of 5,000 ballots in shoeshine mode of operation was run, with no discrepancies in the results and all 5,000 ballots voting positions were counted accurately. Wyle reran the test on OVO S/N UNI000029 for a total of 10,000 more ballots and all results were accurate.

Notice of Anomaly No. 5: Accuracy Test
Wyle performed the accuracy test on 2 OVO units, S/Ns UNI000036 and UNI000044. Prior to the start of testing, it was determined that the ballots had excessive ware on the ballot corners and sides, due to the ballots being utilized in prior testing. Wyle engineers add procedures to replace single ballots or the test deck as necessary if the ballots were becoming hard to insert into the system. However, when the results were tallied for the OVOs, S/N 44 results were correct and S/N 36 had a discrepancy between the expected and report results. Wyle personnel examined the results tapes and isolated the problem to three contests that were undervoted.

Resolution to Anomaly No. 5:
Wyle was able to isolate this anomaly to a single ballot's (labeled 1-1) front side contests all being undervoted. The results and images were sent to Unisyn for analysis. Unisyn's analysis found that the image for the ballot in question was malformed and the ballot was shifted to the left. In addition, the hand marking for this ballot was at approximately 20% fill of the target area in the ovals in question, which is within the acceptable in the Unisyn system. Unisyn's root cause analysis determined that due to the excessive wear on the ballot that hampered entry into the scanner in combination with the smallness of the marks caused the anomaly to happen. Unisyn provided new ballots to Wyle to cast for this election. Wyle hand marked all these ballots identical as before (at approximately 20% fill) and reran the accuracy test and had no anomalies.

Notice of Anomaly No. 6: Accuracy Test
During the retest for Notice of Anomaly 5, Wyle had 2 OVO units in the accuracy test, S/Ns UNI000036 and UNI000044. While Wyle personnel were casting ballots, the power to s/n UNI000036 was lost due to the power cable being removed for the unit.

Resolution to Anomaly No. 6:
Wyle personnel restored power to the unit. The unit did not automatically return to normal voting mode and instead displayed an error message. Wyle personnel followed Unisyn procedures for this error, which recommended recasting all ballots in ballot box. Wyle personnel reran the deck of ballots and the unit recorded all results accurately and without further anomalies.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.2 Anomalies and Resolutions (Continued)

Notice of Anomaly No. 7: Source Code Review
Review of the submitted source code modules comprising the OpenElect Voting System revealed deviations from the standard as well as issues with the commenting.

Resolution to Anomaly No. 7:
A technical summary report of all identified standards violations was sent to the Unisyn for resolution. Unisyn then corrected all standards violations and re-submitted the source code for re-review. This process was repeated as many times as necessary, until all identified standards violations were corrected.

Notice of Anomaly No. 8: Technical Data Package (TDP) Review
Review of the submitted TDP documents revealed discrepancies related to their accuracy, completeness, and compliance to the VVSG. Functional testing also identified text in the TDP that conflicted with the actual operation of the system.

Resolution to Anomaly No. 8:
These discrepancies were reported to Unisyn and tracked as test exceptions until verified that the applicable documents had been corrected. Unisyn corrected each nonconformance observation and resubmitted the associated documents for review. This process continued until the TDP complied with all the requirements of the VVSG.

Notice of Anomaly No. 9: System Level Testing/Trusted Build
During System Level Testing, a final accuracy test was run on the OVCS to verify the trusted build and source code changes. It was discovered that the OVCS would not read 19 or 21 inch ballots correctly.

Resolution to Anomaly No. 9:
Wyle and Unisyn performed analysis on this issue and discovered that the trusted build had and error in one uploaded file. This was due to an issue in the build documentation. Unisyn updated the build documentation to correct the issue. Wyle performed another trusted build and testing was resumed.

Notice of Anomaly No. 10: System Level Testing/Trusted Build
While verifying that the system issues with the build process were resolved, there was an anomaly in the expected results. On the results report there were 2 overvotes that were not expected when casting the 21 inch ballots.

When casting the 14 inch ballots the OVCS gave an alarm and reported that dust was detected. This error notifies the user that there is an obstruction on the scanning surface and recommends cleaning the unit. In addition, Unisyn also recommends rerunning that batch of ballots. Wyle halted the test at the appearance of this error and saved the batch. The results report showed 1 race overvoted.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.2 Anomalies and Resolutions (Continued)

Resolution to Anomaly No. 10:
21 inch ballot – Wyle sent the ballot images to Unisyn for review. Unisyn examined the images and reported back that there were two stray marks on the images caused by residue (dust) on the ballots or present in the scanner. The scanner was checked for cleanliness and blown out with air. The ballots were rerun and all results were accurate.

14 inch ballot – The results were sent to Unisyn who confirmed that there was dirt on the scanner head that caused a mark on the ballot. Wyle examined the scanner and noticed that there was dust on the scanner surface. Wyle cleaned the unit and restarted the test. There were 2200 ballots cast after this incident with no issue.

4.3 Recommendation for Certification

Wyle performed regression testing on all modifications submitted to the Unisyn Voting Solutions, Inc., OpenElect Voting System Version 1.1. Wyle only tested the OpenElect Voting System Version 1.1 for the modification and modules that interface with the modified modules. These modifications meet the requirements of the EAC 2005 VVSG and the manufacturer's technical documentation. As such, Wyle recommends the EAC grant the OpenElect Voting System Version 1.1 certification to the EAC 2005 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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