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CERTIFICATION TEST PLAN

EAC Application Number UNS0801

Prepared for:

Manufacturer name	Unisyn Voting Solutions, Inc.
Manufacturer System	OpenElect Voting System
EAC Application No.	UNS0801
Manufacturer Address	2310 Cousteau Court Vista, CA 92018

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REV	DATE	PAGE OR PARAGRAPH AFFECTED	BY	APP'L	DESCRIPTION OF CHANGES
A	7-24-09	Entire Test Plan			Updated page numbering, spelling corrections and detail in sections added.
B	8-10-09	Paragraph 2.0; Table 3-1; 4.0; 6.3.2			Updated to address comments by the EAC, indicated as Revision B; revised spelling, spacing and TOC page numbering; revisions are not indicated.

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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, Inc., OpenElect Voting System (OVS), Release 1.0, to the requirements set forth for voting systems in the U.S. Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (2005 VVSG). The OVS, Release 1.0, has been submitted to Wyle Laboratories, Inc., for testing to the 2005 VVSG. Prior to submitting the system for certification testing, Unisyn Voting Solutions, Inc., submitted an application to the EAC for certification of the OVS, Release 1.0, to the requirements of the 2005 VVSG.

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.

1.1 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, Revision 4
- 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)

A listing of the OVS Technical Package Documents (TDP) submitted for this certification test effort is listed in Section 3.4 Deliverable Materials.

1.2 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	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	---
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 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.
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	Set of applications supplied by Unisyn to run at the Election Headquarters to support elections on the OVO, OVI, and OVCS systems. Includes: allot 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.

1.2 Terms and Abbreviations (continued)

Table 1-1 Terms and Abbreviations (continued)

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	Used as an 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.
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	Software Under Test
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	---
Voter Verifiable Paper Audit Trail	VVPAT	---
Voluntary Voting System Guidelines	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.

1.3 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.

1.3 Testing Responsibilities (continued)

1.3.1 Project Schedule

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

1.3.1.1 Owner Assignments

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

1.3.1.2 Test Case Development

Wyle will utilize the "Wyle Baseline Test Cases" for the Functional Configuration Audit (FCA), Usability and System Integration Tests. These will be augmented with specially designed test cases catered to the Unisyn OVS. Wyle has designed specific election definition and test cases for the Operational Status Check and the Logic & Accuracy Tests. The "Baseline" functional test cases, "Baseline" usability test cases, and the election definitions are being submitted as part of this test plan package.

1.3.1.3 Test Procedure Development and Validation

Wyle will utilize the Wyle Operating Procedures (WoPs) during the duration of this test program. These procedures are validated are being submitted as part of the test plan package.

1.3.1.4 Third-Party Tests

Wyle will not be using any 3rd party testing during the Unisyn OVS test campaign. All testing will be conducted at Wyle Laboratories Huntsville, Alabama facility.

1.3.1.5 EAC and Manufacturer Dependencies

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

1.4 Target of Evaluation Description

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

1.4.1 System Overview

The OVS is a paper ballot precinct 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. The OVS consists of the OpenElect Central Suite System (OCS), OpenElect Voting Optical (OVO), OpenElect Voting Interface (OVI), and Open Elect Voting Central Scan (OVCS).

1.4 Target of Evaluation Description (continued)

1.4.1 System Overview (continued)

The OCS serves as the election management system (EMS) and is provided to support elections on OVO, OVI, and OVCS systems. The OCS consists of Ballot Layout Manager (BLM), which defines the election and produces ballots; Election Manager (EM), which sets election options, handles audio capabilities and creates an election file; Election Server (ES), which supports the download of new election data created by EM; Tabulator Client (TC), which retrieves and transfers vote files to the Tabulator; Tabulator (TAB), to track uploads and consolidate results; and Tabulator Reports (TR), which reports consolidated results. In addition, the OCS includes the Software Server (SS), which updates and validates voting device application software.

The 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. On Election Day, an OVO at each poll location scans and validates voters' ballots, and provides precinct tabulation and reporting.

The OpenElect Voting Interface (OVI) is a voter interface with 7-inch full-color touch screen display and presents the ballot selected to voters in visual and/or audio formats. The OVI voting device provides printed Voter Assisted ballots using a variety of input devices, that include touchscreen, keypad, and Sip and Puff and provides audio assistance.

The OVCS units reside at a central count location and is designated to read absentee, provisional or recount ballots in large jurisdictions or read the entire election's ballot at a central count location in smaller jurisdictions. The OVCS consists of a COTS high performance desktop PC and a bulk scanner.

1.4.2 Block Diagram

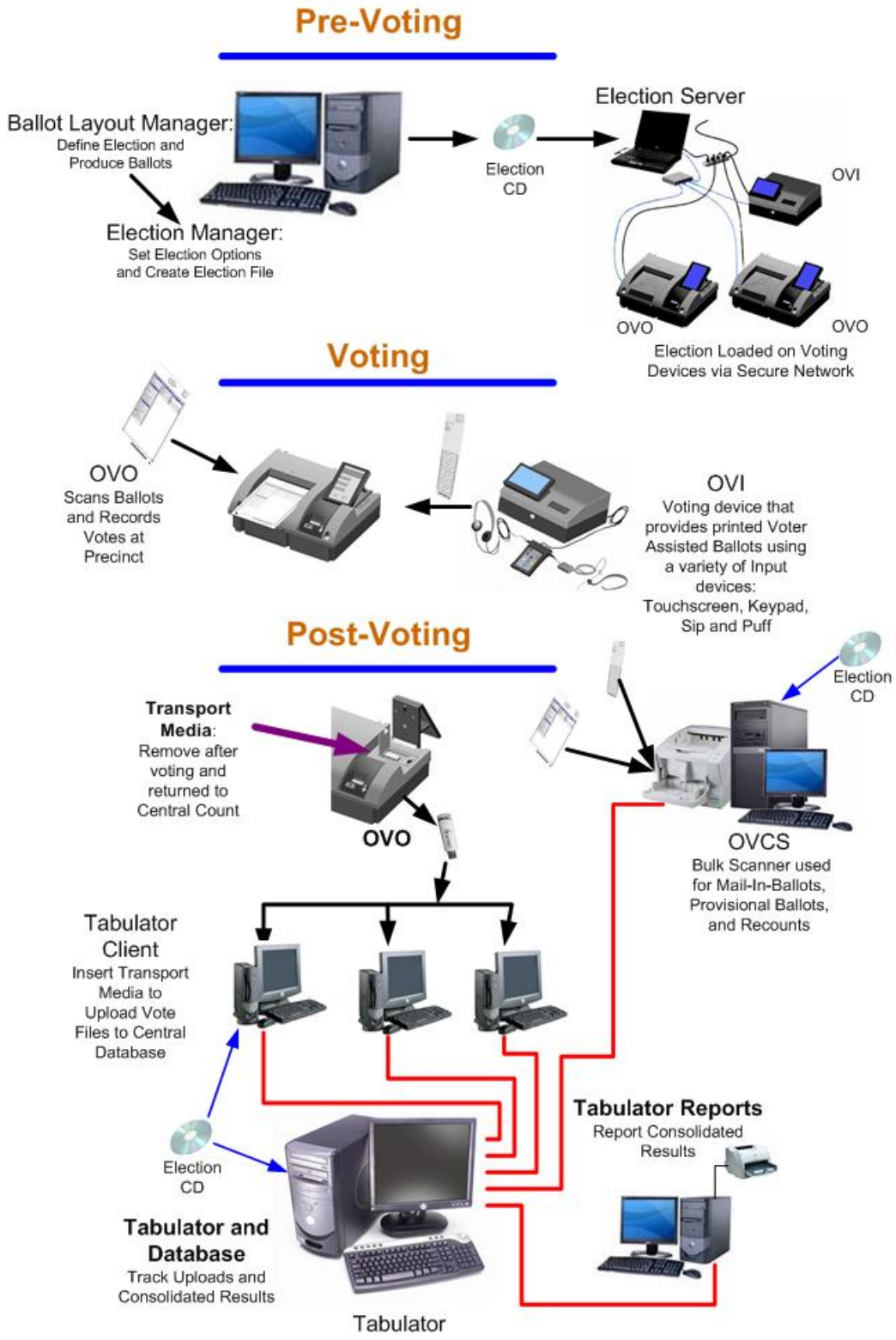

Figure 1-1 System Overview Diagram

1.4 Target of Evaluation Description (continued)

1.4.3 System Limits

The system limits that Unisyn Voting Solutions, Inc., has stated to be supported by the OVS are compiled in the table below.

Table 1-2 OVS 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	12
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
Vote for N of M	25
Ballots per OVO	10000
Card Stock size	8.5 x 14 and 8.5 x 17 (Duplex)
Ballot positions (8.5 x 17) without Rank Choice Voting	348
Ballot positions (8.5 x 17) with Rank Choice Voting	696
Ballot positions (8.5 x 14) without Rank Choice Voting	276
Ballot positions (8.5 x 14) with Rank Choice Voting	552
Ballot style per OVO	30/9/10
Ballots processed (Ballot Box)	700
Units simultaneously loading	20
Precincts initialized per OVO	30
Precincts initialized per OVO in early voting	All

1.4 Target of Evaluation Description (continued)

1.4.4 Supported Languages

The following languages have been stated by Unisyn Voting Solutions, Inc., to be supported by the OpenElect Voting System:

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

1.4.5 Supported Functionality

The OpenElect Voting System is designed to support the following voting variations:

- General Election
- Closed Primary
- Open Primary
- Early Voting
- Partisan offices
- Non-Partisan offices
- Write-in voting
- Primary presidential delegation nominations
- Straight Ticket voting
- Split Precincts
- Ballot Rotation
- Vote for N of M
- Ranked Choice Voting (RCV)
- Procedures for and tabulation of provisional or challenged ballots
- Procedures for and tabulation of absentee ballots
- Audio Ballot

As stated in the System Overview document, the OVS does not include functions for cumulative voting, slate party voting, open blanket primary, special elections, multi-party candidate endorsements, multiple paper ballots, or open primary multi-party ballots; therefore, testing will not be conducted on these functions.

1.4 Target of Evaluation Description (continued)

1.4.6 VVSG

The Unisyn OVS will be tested to all applicable 2005 VVSG requirements. The Unisyn OVS is a paper based precinct counting system that supports a closed network (does not support transmission over public networks). Therefore, all 2005 VVSG requirements intended for DRE and VVPAT will be excluded from this test program. Please refer to Appendix A titled "2005 EAC Program Requirements Matrix" submitted by Wyle along with this test plan for further reference.

1.4.7 Beyond VVSG

The following functions are not required by the 2005 VVSG but are specific functions of the OpenElect Voting System:

- Pennsylvania Rule
- Optional checking and notification of undervotes
- Multiple languages
- Decline to State Primary voting
- Presidential-only voting
- Recount tabulation

2.0 PRE-CERTIFICATION TESTING AND ISSUES

Currently, all pre-certification testing have not 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 completed the source code review and Physical Configuration Audit (PCA). Any further modifications to the source code will result in a re-review of the source code and another PCA. Current on going tests include TDP review, Hardware, and FCA.

The source code review discovered many issues with compliance to the 2005 VVSG. Most of the issues were with commenting. These issues were reported to Unisyn and resolved. Wyle performed the built of the operating system for OVO, OVI and OCS from trusted sources. Modifications to the build procedure or third-party products will require a re-build of these operating systems. All OCS applications, OVO and OVI have been built from the reviewed source code, reviewed configuration files, reviewed scripts and verified third party products during the PCA. A detailed report of the source code review is in Appendix E Source Code Review Report. B

PCA review is complete at this time any modifications to the system or documentation will be reviewed and included in an updated Test Plan. A detailed report of the PCA is in Appendix D Unisyn Open Elect Voting System Physical Configuration Audit.

2.0 PRE-CERTIFICATION TESTING AND ISSUES (continued)

An initial TDP review was performed on the Unisyn documents submitted as their TDP to determine compliance with the 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 or not to address them. The Unisyn documents 2005 VVSG Vendor Testing and TDP Trace have been submitted for review. B

All issues reported to Unisyn will be documented as anomalies. Source Code and TDP reviews will each have one anomaly report for the complete review. These reports will be submitted to the EAC and Unisyn and be included in the final test report.

2.1 Evaluation of Prior VSTL Testing

The OVS is a new voting system that it has not been previously tested to applicable federal standards. It will be fully tested and the results will be submitted to the EAC in accordance with the requirements of the EAC Voting System Testing and Certification Manual, Section 4 Certification Testing and Technical Review.

2.2 Evaluation of Prior Non-VSTL Testing

Unisyn Voting Solutions, Inc submitted a usability report for the OpenElect Voting System Release 1.0 and the report was compiled by Vista Center for the Blind. The testing focused on the two components of the OVS that the voter would use to print ballots and cast votes – the OVO and the OVI. Participants in the test took on the role of voters who would be casting ballots at the polls. Participants also took on the tasks of testing the system used by special needs voters who require auditory, visual or physical assistance to cast their vote.

2.2.1 Reason for Testing and Results

Manufacturers are required to conduct usability testing and submit the results to the VSTL as a part of the TDP. Wyle verified that the report has been submitted and the report states that it is in the common industry format.

2.3 Known Field Issues

This system has never been fielded; therefore, there are no known field issues.

2.3.1 Listing of Relevant Issues

This system has never been fielded; therefore, there are no known field issues.

3.0 MATERIALS REQUIRED FOR TESTING

The materials required for certification testing of the OVS Release 1.0 voting system include software, hardware, test materials, and deliverable materials to enable the test campaign to occur will be delivered by Unisyn to Wyle.

3.0 MATERIALS REQUIRED FOR TESTING (continued)

3.1 Software

The tables below list the software the manufacturer must submit for testing. This section defines the two types of software needed for testing: software used for the testing of hardware, software, telecommunications, security and system integration; and supporting software required for the test environment (operating systems, compliers, assemblers, database managers, and any other supporting software).

The Unisyn OCS software relies on the following third party software applications:

- Linux CentOS Distribution – 5.2
- Java JRE – 1.6.0_02
- MySQL Database – 5.0.45-7
- Apache Tomcat Application Server – 6.0.13
- CUPS – PDF – 2.4.6

The OCS Operating System includes the following third-party software which has been delivered by Unisyn:

Table 3-1 OCS Third-Party Software Descriptions

Software Required For Testing	Software Version	Filename	Hash Value
Linux CentOS Distribution	5.2	CentOS-5.2-i386-bin-DVD.iso	SHA-1: c89db7f5294465d593e7b02c232e0e9070111487
Java SE Runtime Environment	Runtime Environment 6 Update 2	jre-6u2-linux-i586.bin	MD5: 0d30636b5cd23e161da5eda9409f02d5
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	MD5: b20f9d6ed14e55d73a5ed204bca01e7a
Apache Tomcat Application Server	6.0.13	apache-tomcat-6.0.13.tar.gz	MD5: 50442a96332f0ec0cc1fba354f733ad6
CUPS-PDF	2.4.6	cups-pdf-2.4.6-1.el5.i386.rpm	MD5: 502468d50615d27b17671691e2cc1687

B

3.0 MATERIALS REQUIRED FOR TESTING (continued)

3.1 Software (continued)

The OVO Linux Operating System includes the following third-party software which has been delivered by Unisyn:

Table 3-2 OVO Third-Party Software Descriptions

Software Required For Testing	Software Version	Filename	Hash Value
Linux CentOS Distribution	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	MD5: f749d7e17fa01604b9956304efba2333 963258ceafda5c5e6f79be86028b6b3d a08ec9ccfdc89c24f3d6567219f90c42 b31c239009b780d1c89c311c192e43be 0c3990be2271bf44c1495aa0003b5552 9e6f91a5292f46b02777133765fc03fe
Java SE Development Kit	Development Kit 6 Update 2 for Linux	jdk-6u2-linux-i586.bin	MD5: 6a488cb0a161a1c3a541a66e3b076f8e
Java SE Runtime Environment	Runtime Environment 6 Update 2 for Linux	jre-6u2-linux-i586.bin	MD5: 0d30636b5cd23e161da5eda9409f02d5
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	MD5: b20f9d6ed14e55d73a5ed204bca01e7a
Citizen Printer for OVO	1.0.0.6	jpos build ver1.0.0.6 11022009.zip	MD5: ae4bdba9a5f0ea788aab215a41e4b074
Apache Tomcat Application Server	6.0.13	apache-tomcat-6.0.13.tar.gz	MD5: 50442a96332f0ec0cc1fba354f733ad6
openChrome Video Driver	0.2.900-7.el5	xf86-video-openchrome-0.2.900.tar.gz	MD5: 3e36895eb4b4d61e21aa27d370f151c8
eGalax Touchscreen Driver	2.03.1712 (32-Bit) Kernel 2.6	TouchKit-2.03.1712-32b-k26.tar.gz	MD5: 83d042060a87295c8a90019a7df2141a
PDI Scanner Driver and Libraries for OVO	1.2.0, 1.1.3, 1.1.3, 2.1.0	visionx_2740_8430.zip	MD5: 0eac7449d4b928d91ff4d00722294a7f
FVWM Desktop Window Manager	2.4.19	fvwm-2.4.19.tar.gz	MD5: a2fd2c07061303883d6bf89eb2b259ff

3.0 MATERIALS REQUIRED FOR TESTING (continued)

3.1 Software (continued)

The OVI Linux Operating System includes the following third-party software which has been delivered by Unisyn:

Table 3-3 OVI Third-Party Software Descriptions

Software Required For Testing	Software Version	Filename	Hash Value
Linux CentOS Distribution	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	MD5: f749d7e17fa01604b9956304efba2333 963258ceafda5c5e6f79be86028b6b3d a08ec9ccfdc89c24f3d6567219f90c42 b31c239009b780d1c89c311c192e43be 0c3990be2271bf44c1495aa0003b5552 9e6f91a5292f46b02777133765fc03fe
Java SE Runtime Environment	Runtime Environment 6 Update 2 for Linux	jre-6u2-linux-i586.bin	MD5: 0d30636b5cd23e161da5eda9409f02d5
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	MD5: b20f9d6ed14e55d73a5ed204bca01e7a
openChrome Video Driver	0.2.900-7.el5	xf86-video-openchrome-0.2.900.tar.gz	MD5: 3e36895eb4b4d61e21aa27d370f151c8
eGalax Touchscreen Driver	2.03.1712 (32-Bit) Kernel 2.6	TouchKit-2.03.1712-32b-k26.tar.gz	MD5: 83d042060a87295c8a90019a7df2141a
FVWM Desktop Window Manager	2.4.19	fvwm-2.4.19.tar.gz	MD5: a2fd2c07061303883d6bf89eb2b259ff
RXTX - Library and Jar for serial printer	2.1-7r2	rxtx-2.1-7-bins-r2.zip	MD5: 5f21ae633602a24fd3cdd096951476c2

3.0 MATERIALS REQUIRED FOR TESTING (continued)

3.1 Software (continued)

The XP Build Machine Operating System includes the following third-party software which has been delivered by Unisyn:

Table 3-4 XP Build Machine Third-Party Software Descriptions

Software Required For Testing	Software Version	Filename	Hash Value
Microsoft Windows XP Service Pack 1	Version 2002 SP 1	Microsoft Windows XP Install Disc	N/A
Java Development Kit and Java Runtime Environment	Runtime Environment 6 Update 2	jdk-6u2-windows-i586-p.exe	MD5: 72a73e37d5e0724c7a3d9374a126e4cf
Java 2 Enterprise Edition	1.3.1	j2sdkee-1_3_01-win.exe	MD5: 621709dc888d9450918ccef05fcf6d1d
Java Cryptography Extension	Jurisdiction Policy Files 6	jce_policy-6.zip	MD5: b20f9d6ed14e55d73a5ed204bca01e7a
Apache Ant	1.7.0	apache-ant-1.7.0-bin.zip	MD5: ac30ce5b07b0018d65203fbc680968f5
Jasper Reports	2.0.5	jasperreports-2.0.5-project.zip	MD5: b80bd29e4f95f18bd15da65cfd45d1d2
SQL Connector	5.1.7	mysql-connnector-java-5.1.7.zip	MD5: f9a8008367f5b25bdec045c54100d5b0
Apache Axis	1.4	axis-bin-1_4.zip	MD5: 9eda42bf82a274349f18c5affdd93608
Apache Commons Codec	1.3	commons-codec-current.zip	MD5: c30c769e07339390862907504ff4b300
Apache Commons Http	3.0	commons-httpclient-3.0.zip	MD5: 42d96b0c7d627a2170fd57280476c8fe
Apache Commons File Upload	1.2	commons-fileupload-1.2-bin.zip	MD5: 6fbe6112ebb87a9087da8ca1f8d8fd6a
Apache Commons IO	1.3.2	commons-io-1.3.2-bin.zip	MD5: ba31cc4a0d85842e4b0bfdf2472382ba
Apache Tag Library	1.1.2	jakarta-taglibs-standard-current.zip	MD5: f75c964f1b276b022c24a677ccc17d4d

3.0 MATERIALS REQUIRED FOR TESTING (continued)

3.1 Software (continued)

Table 3-4 XP Build Machine Third-Party Software Descriptions (continued)

Java Help	2.0_05	javahelp-2_0_05.zip	MD5: b9b12989471f5858c982154335e1cc96
Javazoom MP3	1.9.4	mp3spi1.9.4.zip	MD5: e259e7674d9b19e76f005cee2810e7f5
Citizen Printer for OVO	1.0.0.6	jpos build ver1.0.0.6 11022009.zip	MD5: ae4bdba9a5f0ea788aab215a41e4b074
PDI Scanner Driver and Libraries for OVO	1.2.0, 1.1.3, 1.1.3, 2.1.0	visionx_2740_8430.zip	MD5: 7794168911b9faf05ce49828cd517aab
RXTX Serial Interface	2.1-7	rxtx-2.1-7-bins-r2.zip	MD5: 5f21ae633602a24fd3cdd096951476c2
Star Printer for OVI	2007-03-17	starjavapos_linux_20070317.zip	MD5: 172b1fcfecae654b00463be74efc7fbb

All software installed on the OVS components will be built by Wyle using reviewed source code. All software built by Wyle during the witness build process will have a MD5 hash made of the resulting software files or disc images. The software built by Wyle includes: OCS Linux, OVO Linux, OVI Linux, OVO Firmware, OVI Firmware, the XP Build Machine, and the OCS software. The following table lists the software built, the version number of the software, the name of the created files or disc image, the date the witness build was performed, and the hash value calculated for the software:

Table 3-5 OpenElect Voting System Software Components

Software	Version	Filename	Build Date	MD5 Hash Value
OCS Linux	0.0.99	CentOS-5.2-i386-bin-DVD.iso	4/27/09	64f571e9062749e2589b56b6856a11db
OVO Linux	0.0.99	CentOS-5.0-i386-bin-1of6.iso	4/16/09	6e20bdb43c33097523cb530393d4d04b
OVI Linux	0.0.99	CentOS-5.0-i386-bin-1of6.iso	4/17/09	951694710a51455841a28d0a5c40473f
OVO Firmware (Validator and Scripter Included)	1.2	TOC (file) Release.zip	4/21/09	eb2d720a401d58042e48ae0ecaf434bc 3f13b7c4092fca7558a75c7faf860829
OVI Firmware (Validator and Scripter Included)	1.0	TOC (file) Release.zip	4/20/09	8c9aa90528b7a76dc70245885714078b a21ecd707ffdc282a8523c0093eaaf70
XP Build Machine	---	---	---	---
OCS Software	---	---	---	---

3.0 MATERIALS REQUIRED FOR TESTING (continued)

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.

Table 3-6 OpenElect Voting System Equipment Description

Equipment	Manufacturer	Version/Model	Description	COTS/Non-COTS
PC 1	Dell Optiplex 755	Processor: Intel Core2Duo E7200 2.53Ghz Memory: 4x 1GB 800Mhz RAM Hard Drive Capacity: 250GB (Mirrored)	G5HW3J1	COTS
PC 2	Dell Optiplex 755	Processor: Intel Core2Duo E7200 2.53Ghz Memory: 4x 1GB 800Mhz RAM Hard Drive Capacity: 250GB (Mirrored)	F5HW3J1	COTS
PC 3	Dell Optiplex 755	Processor: Intel Core2Duo E7200 2.53Ghz Memory: 4x 1GB 800Mhz RAM Hard Drive Capacity: 250GB (Mirrored)	D5HW3J1	COTS
Laptop	Dell Latitude E5500	Processor: Intel Core2Duo T7250 2.0Ghz Memory: 2x 1GB 800Mhz RAM Hard Drive Capacity: 120GB	C9448J1	COTS

In order to perform the software witness and trusted builds, two Personal Computers have been provided as build machines. The build machines are described in the table below:

3.0 MATERIALS REQUIRED FOR TESTING (continued)

3.2 Equipment (continued)

Table 3-7 OpenElect Voting System Build Machine Description

Equipment	Manufacturer	Version/Model	Serial Number	COTS/Non-COTS
XP Build Machine	Dell Precision 340	Processor: Intel Celeron D 1.8Ghz Memory: 2x 256Mb RAM Hard Drive Capacity: 20Gb Monitor: HP 7500 17" CRT	OVO309002	COTS
Linux Build Machine	Unisyn	Processor: VIA 1.0Ghz Memory: 512Mb RAM Hard Drive Capacity: 80Gb	OVO309003	Non-COTS

To support the test program, Unisyn has provided additional supporting hardware for the provided Personal Computers. A list of these items is provided below:

Table 3-8 OpenElect Voting System Support Equipment Description

Test Material	Make	Model	Serial Number
COTS Printer	Dell	1720dn	632VXOD
COTS Printer Stand/550 Sheet Drawer	Dell	N/A	62B68NP
COTS External DVD-RW Drive	LG Electronics	GP08LU10	901HKDJ095530

The OVO and OVI units have been divided into five units for testing and are referred to as Equipment Under Test (EUT's). Each EUT consists of at a minimum, one OVO, one OVI, one Ballot Box, and a UPS for each unit. Each EUT may also be paired with accessories such as headphones, or a sip and puff device.

The table below provides the serial numbers of the components which comprise each EUT:

Table 3-9 OpenElect Voting System Equipment Configurations

EUT	OVO	OVI	Ballot Box	Peripheral Equipment	
				Headphones	Sip & Puff
1	UNI000004	UNI150010	BB0001	56285-03	N/A
2	UNI000002	UNI150004	BB0004	56285-02	005954
3	UNI000003	UNI150005	BB0003	56285-01	N/A
4	UNI000001	UNI150003	BB0005	N/A	N/A
5	UNI000007	UNI150006	BB0002	N/A	N/A

COTS equipment that is used by the Unisyn OpenElect Voting System is listed below with its make, model, and serial number:

3.0 MATERIALS REQUIRED FOR TESTING (continued)

3.2 Equipment (continued)

Table 3-10 OpenElect Voting System COTS Equipment Identification

COTS Equipment	Make	Model	Serial Number
Sip & Puff 1	Origin Instruments	AirVoter	005954
Sip & Puff 2	Origin Instruments	AirVoter	005953
UPS 1	Minuteman	Entrust Series ETR1500	AE58080900492
UPS 2	Minuteman	Entrust Series ETR1500	AE58080900496
UPS 3	Minuteman	Entrust Series ETR1500	AE58080900498
25x Transport Media (USB Flash Drives)	STEC	Thumb Drive (UFD) 1GB Capacity	TM100009, TM1000011-12, TM1000014-35
Network Hub	3Com	Office Connect Dual Speed Hub 8	0100/7T3F084894
Headphones	Sony	Stereo Headphone Model MDR-210LP	56285-01
Headphones	Sony	Stereo Headphone Model MDR-210LP	56285-02
Headphones	Sony	Stereo Headphone Model MDR-210LP	56285-03

3.3 Test Materials

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

The following test materials are required to support OVS Release 1.0 certification testing.

Table 3-11 OpenElect Voting System Test Support Materials

Test Material	Quantity	Make	Model
2x 50 CD-R Spindle	2	Imation	1x-52x 700mb
1x 50 DVD-R Spindle	1	Imation	16x 2 hr
8 ½" x 11" Paper in Speed Loading Box (2500 Sheets)	1	Boise	SP8420
Box of OVI Paper Rolls	1	N/A	OVI Printer Paper
Box of OVO Paper Rolls (2.25" x 1.75")	3	N/A	OVO Printer Paper
Box of OVO Paper Rolls (2.25" x 3")	5	N/A	OVO Printer Paper
Portable Hard Drive	1	Western Digital	My Passport Elite 500GB

3.0 MATERIALS REQUIRED FOR TESTING (continued)

3.3 Test Materials (continued)

Table 3-12 OpenElect Voting System TDP Documents

OVS Release 1.0 Voting System TDP Documents	Version	Date	Document Number
Documents describing overall system performance:			
System Overview	1.8	06/23/09	04-00446
System Security Specification	1.2	04/28/09	04-00447
Configuration Management Plan	1.1	04/11/09	04-00448
Quality Assurance Plan	1.3	05/27/09	04-00454
System Test and Verification Plan	1.1	03/23/09	04-00453
Personnel Training and Deployment Requirements	1.2	05/13/09	04-00445
Documents describing functionality, hardware, software design, maintenance, and operation:			
Software and Design Specification	1.2	05/13/09	04-00464
System Coding Standards	1.3	05/13/09	04-00449
System Acronyms	1.2	05/13/09	04-00494
System Functionality Description	1.1	04/09/09	04-00444
System Maintenance Procedures	1.0	05/13/09	04-00459
System Hardware Specification	1.1	05/13/09	04-00458
Ballot Layout Manager User Guide	1.4	05/27/09	04-00428
Election Manager User Guide	1.3	05/18/09	04-00427
Election Server User Guide	1.2	06/03/09	04-00429
Software Server User Guide	1.2	05/27/09	04-00430
Tabulator Client User Guide	1.0	01/07/09	04-00431
Tabulator User Guide	1.0	01/09/09	04-00432
Tabulator Reports User Guide	1.0	01/07/09	04-00433
OVCS User Guide	Not Received	Not Received	Not Received
System Operations Procedures: Election Day Pollworker's Guide	1.0	02/01/09	04-00463
Systems Operations Procedures: Election Day Operator's Guide OVO and OVI	1.0	11/10/08	04-00461
Operations Procedures: Election Day Troubleshooter's Guide OVO and OVI	1.0	02/05/09	04-00462
System Operations Procedures: Warehouse Technician's Guide (OVO)	1.0	02/11/09	04-00460
System Operations Procedures: Warehouse Technician's Guide OpenElect Voting Interface (OVI)	1.0	5/26/09	04-00457

3.0 MATERIALS REQUIRED FOR TESTING (continued)

3.4 Deliverable Materials

The materials listed below are to be delivered as part of the OpenElect Voting System to the users.

Deliverable Material	Version	Description
OCS	1.0	EMS software suite
OVO	1.0	Precinct ballot scanner
OVI	1.0	Accessible voting station
Ballot Box		OVO ballot receptacle
Transport media	STEC 1 GB	USB Flash Drive X 2
Minuteman UPS	ETR1500	UPS X 2
Headphones (optional)	MDR-210LP	Stereo headphones
Sip and Puff (optional)	AirVoter	Binary input device
04_00446 System Overview.doc		TDP Document
04-00459 System Maintenance Procedures		TDP Document
04-00454 Quality Assurance Plan		TDP Document
04-00494 OVS Acronyms		TDP Document
04-00428 Ballot Layout Manager User Guide		TDP Document
04-00427 Election Manager User Guide		TDP Document
04-00429 Election Server User Guide		TDP Document
04-00430 Software Server User Guide		TDP Document
04-00431 Tabulator Client User Guide		TDP Document
04-00432 Tabulator User Guide		TDP Document
04-00433 Tabulator Reports User Guide		TDP Document
04-00495 OVCS User Guide		TDP Document
04_00457 OVS System Operations Guide Warehouse OVI		TDP Document
04_00460 OVS System Operations Guide Warehouse OVO		TDP Document
04_00461 OVS System Operations Guide EDay Operators		TDP Document
04_00462 OVS System Operations Guide EDay Troubleshooters		TDP Document
04_00463 OVS System Operations Guide EDay Pollworkers		TDP Document
04-00503 OVS Paper Specification		TDP Document

As part of the verification of the Unisyn OVS, a process is provided to verify the system using MD5 checksum. A verify user is created on the Linux operating system with a customer specific 12 digit password. The verify user has only read privileges to all directories and files and rights to execute the md5sum utility on the Linux operating system. This allows the entire system to be hashed and verified to contain the correct files independently of the Unisyn software.

4.0 TEST SPECIFICATIONS

Certification testing of the OpenElect Voting System 1.0 is to the configuration submitted in the EAC application UNS0801. Wyle qualified personnel will ensure that all certification testing performed on the manufacturer's voting system follows Wyles procedures for testing and the specific test cases to ensure the requirements of the 2005 VVSG and EAC Testing and Certification Program Manual.

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

Interpretations
2009-02 EAC Decision on Alternate Languages
2009-01 EAC Decision on VVPAT Accessibility New
2008-12 EAC Decision on Ballot Marking Device/Scope of Testing
2008-10 EAC Decision on Electrical Fast Transient
2008-09 EAC Decision on Safety Testing
2008-08 EAC Decision on Automatic Bar Code Readers
2008-07 EAC Decision on 0' Count to Start Election
2008-06 EAC Decision on Battery Backup for Central Count
2008-05 EAC Decision on Durability
2008-04 EAC Decision on Supported Languages
2008-03 EAC Decision on OS Configuration
2008-02 EAC Decision on Battery Backup for Optical Scan Voting Machines
2008-01 EAC Decision on Temperature and Power Variation
2007-06 EAC Decision on Recording and Reporting Undervotes
2007-05 EAC Decision on Testing Focus and Applicability
2007-04 EAC Decision on Presentation of Alternative Language
2007-03 EAC Decision on Summative Usability Testing
2007-02 EAC Decision on Variable Names
2007-01 EAC Decision on Accessible Design

Notice of Clarifications
NOC 07-001 -- Timely Submission of Certification Application
NOC 07-002 -- VSTL Work with Manufacturers Outside of Voting System Certification Engagements
NOC 07-003 -- State Testing Done in Conjunction with Federal Testing within the EAC Program
NOC 07-004 -- Voting System Manufacturing Facilities
NOC 07-005 -- Voting System Test Laboratory Responsibilities in the Management and Oversight of Third Party Testing
NOC 08-001 -- Validity of Prior Non-core Hardware Environmental and EMC Testing
NOC 08-002 -- EAC Mark of Certification
NOC 08-003 -- EAC Conformance Testing Requirements
NOC 09-001 -- Requirements for Test Lab Development and Submission of Test Plans
NOC 09-002 -- Laboratory Independence Requirement

B

4.0 TEST SPECIFICATIONS (continued)

4.1 Requirements (Strategy of Evaluation)

To evaluate the system test requirements, each section of the 2005 VVSG will be analyzed to determine the applicable tests. The 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 design for the Unisyn OVS. 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 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 insure these requirements are met.
- **Section 6: Telecommunication** – A test of the telecommunication technologies utilized by the Unisyn OVS will be tested for data accuracy and correctness by analyzing the packet level information being transmitted. Section 6.2.6 will be excluded since the Unisyn OVS 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. In addition to functional testing, the source code for the Unisyn OVS will be analyzed utilizing Fortify Source Code Analysis (SCA) for security vulnerabilities in addition to the manual line by line review.
- **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 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's documentation to ensure their QA process is being followed. Wyle personnel will not complete the requirements of 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 customers location, per EAC Laboratory Accreditation Program Manual, Section 2.11.6.
- **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 2005 VVSG compliance and to further determine whether Unisyn is following its documented CM requirements within the TDP. Any anomalies will be formally reported to Unisyn as describe in Section 4.6 TDP Evaluation. During source code review, Wyle qualified personnel will verify that Unisyn is following 2005 VVSG CM requirements as well as Unisyn's CM requirements. Any anomalies will be formally reported to Unisyn as described in Section 4.7 Source Code Review. All equipment received for initial testing and follow up testing will be checked against Unisyn's documentation to ensure their CM process is being followed.

4.0 TEST SPECIFICATIONS (continued)

4.1 Requirements (Strategy of Evaluation) (continued)

4.1.1 Mapping of Requirements to Equipment Type and Features

Refer to the "2005 EAC Program Requirements Matrix" submitted as Appendix A EAC Requirements Matrix.

4.1.2 Rationale for 'Not Applicable' Requirements

The Unisyn OVS is a paper based precinct counting system that supports a closed network (does not support transmission over public networks). Therefore, all 2005 VVSG requirements intended for DRE and central count systems, along with Volume I Section 6.2.6 (Telecommunication Requirements), Volume I Section 7.5.2 (Telecommunications and Data Transmission), Volume I Section 7.6 (Use of Public Communications Networks), Volume I Section 7.7 (Wireless Communications), and Volume I Section 7.9 (Voter Verifiable Paper Audit Trail Requirements) will be excluded from this test campaign.

The rational for not testing Section 6.2.6 is that these requirements are written for use on public networks.

The rational for not testing Section 7.5.2 and 7.5.3 is that these requirements are written for use on public networks and the Unisyn OVS does not use public networks. Section 7.5.4 was written for shared operating environment on ballot recording and vote counting equipment. The OVO and OVI and dedicated operating environments. Section 7.5.5 is written for systems that support incomplete election returns and the Unisyn OVS does not support the reporting of incomplete election returns.

The rational for not testing Section 7.6 is stated in the requirement "Voting systems that transmit data over public telecommunications…" The Unisyn OVS does not support transmission over public networks.

The rational for not testing Section 7.7 is no wireless technology is present in the Unisyn OVS.

The rational for not testing Section 7.9 is the Unisyn OVS is a paper based system.

Refer to the Appendix A 2005 EAC Program Requirements Matrix for specific requirements that are excluded during this test campaign.

4.2 Hardware Configuration and Design

The OVS is a paper ballot precinct voting system using touch screen and scan technology to scan and validate ballots, provide voter-assisted ballots, and tabulate precinct results. The OVS system consists of an election management system (the OCS, which contains Ballot Layout Manager, Election Manager, Election Server, Tabulator Client, Tabulator Server, and Tabulator Reports); the OVO voting device that scans and validates voter ballots and provides a summary of all ballots cast; and the OVI voter interface to facilitate special needs voters.

The OVS is comprised of two proprietary pieces of hardware, OVO and OVI and one piece of COTS hardware: OVCS. All EMS functions are handled by proprietary software run on COTS PC/Laptops. Wyle has determined that these COTS PC/Laptops are not subject to the hardware per the 2005 VVSG. The provided PC/Laptops documented in Section 3 Materials Required For Testing all contained "CE", "UL", and "FCC" labeling: therefore no further hardware testing will be performed on these COTS units for this test program.

4.2 Hardware Configuration and Design (continued)

OVO – OVO will be set on the ballot box to simulate real election configuration. During operational tests the unit will be run in "Shoe-Shine" mode and scan test ballots for the duration of operational test. Each unit will be loaded with the "Pre/Operational/Post 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, Availability and Accuracy Test result. No Operational data will be collected during the non-operational tests.

OVI – OVI is considered a table top unit for hardware testing. Each unit will be loaded with the Operational Status Check 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, Availability and Accuracy Test result. During Pre-operational and Post-operational test ballots will be printed from the OVI unit and scanned into the OVO unit. The OVI will be configured to run audio throughout the duration of hardware operational test.

OCVS – OVCS is a Cannon DR-X10C Scanner. This scanner has both CE and FCC labeling. No hardware qualitative or environmental tests will be run on this hardware.

4.3 Software System Functions

The Unisyn OVS software is written in the Java programming language and is a combination of four main components:

- OCS
- OVO
- OVI
- OVCS

The OVO software package functions as firmware on the OVO unit. The OVI software package functions as the firmware on the OVI unit. The OCS software package is comprised of six individual subcomponents which function as the EMS:

- Ballot Layout Manager
- Election Manager
- Election Server
- Tabulator Client
- Tabulator Server
- Tabulator Reports

The OVCS software package interacts with the Tabulator modules (Tabulator Client, Tabulator Server, and Tabulator Reports) of the OCS software packages.

4.0 TEST SPECIFICATIONS (continued)

4.3 Software System Functions (continued)

Additionally, the OCS contains utilities RegKeyUtilities, Software Server, and OCSInstaller. RegKeyUtilities is a set of utilities that provide an interface encryption method for use outside the application. Software Server updates and validates voting device client software. OCSInstaller is an application that reads and verifies the contents of an OCS release and performs the functions necessary on the Unisyn Linux OS to install and configure the application on a proper target machine. The OVO and OVI units utilize Scripter and Validator utility. The Scriptor tool is used to release files for the OVI and OVO for use on the Software Server application. Validator is a utility on the OVI and OVO units that validates the installed software using a CRC checksum before allowing the application to run.

The Unisyn Quality Assurance Plan testing documentation includes the System Test and Verification Plan document (submitted as a single document) and Test Modules, Test Cases, Test Procedures, Acceptance Plan, and Test Summaries and Final Reports (submitted in an electronic folder labeled Test Cases). Individual folders have been created for OVO Functional, OVO Election, OVI Unit, Ballot Layout Manager, Tabulator, Tabulator Reports, Election Server, Tabulator Client, Election Manager, Software Server, and OVS Hardware. Within each test case spreadsheet, worksheets labeled Test Suite Identification, Test Coverage Matrix, Test Cases (some include several worksheets addressing different tests) are included. The QA Plan defines Test Modules, Test Cases, and Test Procedures. Based on the QA Plan document, it is unclear which identified Test Modules, etc. listed in the QA Plan are included in each Test Suite Identification, Test Coverage Matrix, and Test Cases/Scripts.

4.4 Test Case Design

Wyle 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 uses both “Verification” and “Validation” to some degree. 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 to all four levels.

4.4.1 Hardware Qualitative Examination Design

There are no previous examinations of the Unisyn OVS. Wyle Laboratories, Inc., will conduct a review of the system performance characteristics in accordance with Volume II, Appendix A, Section 4.3.1 of the 2005 VVSG to determine the following: Overall system capabilities, Pre-voting functions, Voting functions, and Post-voting functions.

4.4.1.1 Mapping of Requirements to Specific Interfaces

Please refer to the Wyle Laboratories’, Inc., proprietary document “Wyle's EAC Program Req Matrix - VVSG 2005”, submitted by Wyle along with this test plan for further reference on requirements mapping.

4.0 TEST SPECIFICATIONS (continued)

4.4 Test Case Design (continued)

4.4.2 Hardware Environmental Test Case Design

The Unisyn OVS hardware will be tested by the Wyle Laboratories' EMI, Dynamics, and Environmental test facilities for testing to the hardware requirements in accordance with Wyle Laboratories A2LA certifications 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-and post- tests will be conducted by Wyle qualified personnel at the Wyle Huntsville, AL facility.

The following hardware tests shall be performed per Volume I of the 2005 VVSG:

- Electrical Supply (Section 4.1.2.4)
- Electrical Power Disturbance (Section 4.1.2.5)
- Electrical Fast Transient (Section 4.1.2.6)
- Lightning Surge (Section 4.1.2.7)
- Electrostatic Disruption (Section 4.1.2.8)
- Electromagnetic Emissions (Section 4.1.2.9)
- Electromagnetic Susceptibility (Section 4.1.2.10)
- Conducted RF Immunity (Section 4.1.2.11)
- Magnetic Fields Immunity (Section 4.1.2.12)
- Environmental Control – Operating Environment (Section 4.1.2.13)
- Environmental Control – Transit and Storage (Section 4.1.2.14)
- Safety (Section 4.3.8)

4.4.3 Software Module Test Case Design and Data

Wyle implements Component Level Testing during the FCA for each component and subcomponent, exercising the functionality of each component and subcomponent 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 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 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 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.

4.0 TEST SPECIFICATIONS (continued)

4.4 Test Case Design (continued)

4.4.3 Software Module Test Case Design and Data

- "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 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 SUT performs as expected the results will be accepted including entries for invalid data. 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 re-run 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 can not be reproduced the results would be determined to be not repeatable and the test would continue. Wyle will document the error and track the error through resolution. Wyle will 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.

4.4.4 Software Functional Test Case Design and Data

Wyle implements Integration Level Testing primarily focusing on the interface between components and applications. The test approach to be used for the Unisyn OVS 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 at the Integration Level is "Use Case". The actors that have been identified to use the Unisyn OVS 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 test 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 cast 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 result 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 down stream 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 be utilize the "Master Copy" of data at the Integration Level are Security, Telecommunication, and Usability.

4.0 TEST SPECIFICATIONS (continued)

4.4 Test Case Design (continued)

4.4.4 Software Functional Test Case Design and Data (continued)

Wyle expects the components and applications at the Integration Level to interface without error. 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 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.

4.4.5 System-Level Test Case Design

Wyle 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 systems intended use. The Unisyn OVS is intended to support both large and small jurisdictions. Wyle's approach for Unisyn OVS will be to execute most System Level Testing for a large jurisdiction. Wyle will have three different test setup configurations for the OCS components.

- Configuration One will install each OCS component on separate PCs regardless of the component's function.
- Configuration Two will install Ballot Layout Manager and Election Manager on one PC, install Election Server on a laptop, and install Tabulator Client, Tabulator Monitor, Tabulator Server, and Tabulator Reports on another PC.
- Configuration Three – All OCS components will be loaded onto a single laptop or PC.

Wyle has concluded Configurations One and Two are the most logical configurations for a large jurisdiction because of the components intended function. Configuration Three is designed to illustrate the ability of the system components to all execute in the same environment.

- Configuration One will be utilized in System Integration Testing.
- Configuration Two will be utilized for System Integration Testing, Volume, Stress, and Reliability Testing, Security Testing, and Telecommunications Testing.
- Configuration Three will be utilized for System Integration Testing, Usability Testing, Accessibility Testing, and Logic and Accuracy Testing (Temp/Power).

Wyle has concluded Configuration One will allow too much extra capacity and processing to the system for most of the performance based test. Configuration Three would not logically be installed in a large jurisdiction, and therefore Configuration Two will be used for the stated performance tests. Configuration Three was selected for the Usability, Accessibility, and Logic and Accuracy Tests because of the ease of use of the laptop during those tests. All three configurations will be used during System Integration Test.

4.0 TEST SPECIFICATIONS (continued)

4.4 Test Case Design (continued)

4.4.5 System-Level Test Case Design (continued)

Wyle expects all hardware, software, and peripherals to function as a complete system without error during System Level Testing. The ACCEPT/REJECT criteria for System Level testing is whether the system can continue if an error is encountered or if the system is too unstable to continue. If an error occurs during System Level Testing the error will be documented. If the Unisyn OVS is able to recover and continue, the test will continue. If the error causes the system to become unstable the test will be halted. All errors documented during System Level Testing will be tracked through resolution. Engineering analysis will be performed to determine what effect the resolution has on the system. A determination will be made whether Regression Testing will be sufficient or a complete re-test is necessary.

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, volume testing, stress 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 in the 2005 VVSG have been tested. All requirements will be checked against the test data to ensure the 2005 VVSG requirements are met. Items not supported by Unisyn OVS will be documented. Any issues documented during testing will be resolved.

Wyle expects that every 2005 VVSG requirement supported by the Unisyn OVS will be tested. Wyle will report all issues discovered during this test campaign to the EAC. The EAC has the final determination on whether the system meets all the requirements for an EAC certified system. The ACCEPT/REJECT criteria for Acceptance Level testing is whether the data for the test campaign supports a recommendation for certification by the EAC or not. If Wyle determines there is not enough data to insure a requirement was met, the test plan will be altered and further testing will be done.

4.5 Security Functions

The purpose of the security testing will be to evaluate the effectiveness of the OVS in detecting, preventing, logging, and recovering from any security risks identified by simulating attacks on the system. To accomplish this, Wyle has developed internal operating procedures to evaluate the Unisyn OVS to the security requirements set forth in the 2005 VVSG. These procedures have been specifically tailored to assess the Unisyn OVS to the applicable requirements. Wyle will attempt to defeat the access controls and physical security measures documented in the Unisyn technical data package. A threat matrix will be created to determine the risks and vulnerabilities. The procedures are proprietary and have been submitted as part of the test plan package.

Wyle will utilize a combination of functional testing, source code review, and Fortify SCA to evaluate the OVS. The following areas are not applicable to the OVS and are therefore not included in the scope of the security testing:

- Use of Public Networks
- Wireless Communication

Testing will be performed by a qualified security expert. All findings will be reported to Unisyn for resolution. Unisyn will review all findings and correct risks they deem as valid. All documented risks will be reported as an addendum to the final test report.

4.0 TEST SPECIFICATIONS (continued)

4.6 TDP Evaluation

Wyle qualified personnel will perform a comprehensive review of the Unisyn TDP to determine compliance to the 2005 VVSG, EAC requirements, and Unisyn-specific requirements. Wyle qualified personnel utilize a TDP Review Matrix (see Appendix F) which lists every 2005 VVSG requirement pertaining to TDP review. Wyle 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.

4.7 Source Code Review

As part of the pre-testing activities, the Unisyn Voting Solutions, Inc., OpenElect Voting System (OVS) source code was reviewed to the 2005 VVSG coding standards and the manufacturer supplied coding standards. The Source Code Review Reports are included in Appendix E Source Code Review Report. The review was conducted per the guidelines described in the following paragraphs.

As the source code was received, an MD5 hash value was created for each source code file. The source code team then conducted a visual scan of every line of source code for an initial review and every line of modified source code for a re-review. This was done to identify any violation of 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.

If the review was the initial review, the source code team performed a peer-review of 10 % of the code. This was done to evaluate the correctness of the review and look for standards violations that may have been missed or violations that were noted in error. Any standards violations that the team concluded were recorded in error or missed were then corrected in the code review notes.

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. All reports will be included in an anomaly report for source code and submitted to the EAC and included in the final test report.

Unisyn uses an auto-feed option designed in the system to repetitively feed ballots in and out of the scanner. This feature is documented as “Auto-Feed” mode or “Shoe Shine” mode. As part of the source code review this function was inspected in detail to meet the requirements of 2005 VVSG Volume 1 Section 2.2.4 g and h.

4.0 TEST SPECIFICATIONS (continued)

4.7 Source Code Review (continued)

The final step will be to create a "Trusted Build" from the reviewed source code. The "Trusted Build" follows the steps below:

- Clean the build machine
- Retrieve the compliant source code
- Retrieve the installation media for OS, compilers, and build software
- 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 a 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 EAC Approved Repository.

The "Trusted Build" for Unisyn Voting Solutions, Inc. OpenElect Voting System (OVS) 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 MD5's 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 CentOS Linux 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 state that they comply with ISO 9001 and cite internal Unisyn ISO 9001 documentation for details. Both the Unisyn QA Plan and CM Plan will be reviewed to determine compliance with 2005 VVSG Volume II Section 2, and Volume I Sections 8 and 9, EAC stated requirements, and with the requirements of the internal Unisyn ISO 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 of this test plan. The results of the TDP review, including the QA and CM compliance results, are included in Appendix F Technical Data Package Review. The results of the TDP review 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 submitted to Unisyn for resolution. Additionally, all test results, including functional test data, will be recorded on the relevant Wyle Laboratories' Operating Procedure and Test Cases. Results will also be recorded real-time in engineering log books.

5.2 Test Data Criteria

Wyle Laboratories, Inc. will evaluate all test results against the Unisyn Voting Solutions' provided technical documentation for the OVS and the requirements set forth in the 2005 VVSG. The OVS shall be evaluated for its performance against the 2005 VVSG. The acceptable range for system performance and the expected results for each test case shall be derived from the OVS documentation. Per the 2005 VVSG, these parameters shall encompass the test tolerances, 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, and 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).

5.3 Test Data Reduction

Test data shall be manually 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 the Wyle 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 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.

6.0 TEST PROCEDURES AND CONDITIONS (continued)

6.1 Facility Requirements (continued)

Unless otherwise specified herein, all remaining tests, including system level functional testing, shall be performed at standard ambient conditions:

- Temperature: 25°C ± 10°C (77°F ± 18°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 test responsible agency with sufficient engineering information to substantiate the deviation request, but only when best effort technique and system limitations indicate the need for a deviation.

6.2 Test Set-Up

All voting machine equipment (hardware and software), shall be received and documented utilizing Wyle 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, Inc., representative shall be notified.

Wyle 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, Inc., representative for resolution.

TDP items, including all manuals, and all source code modules received will be inventoried and maintained by the Wyle 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 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 technical documentation. Wyle will develop an operational status test to be performed prior to and immediately following each hardware test. Wyle will develop the system performance levels to be measured during operational tests. Wyle has developed eight election definitions to be used during this test campaign. Below is a brief description of each election definition:

6.0 TEST PROCEDURES AND CONDITIONS (continued)

6.2 Test Set-Up (continued)

Hardware Operational
This test will exercise the operational status of the OVO and OVI units during operational hardware tests. The election will be setup as an early voting machine. The election will have a precinct titled Pre – XXXX, OP – XXXX and a POST – XXXX for each test. The OVI will vote a predetermined voting pattern and the ballots scanned into the OVO for the Pre – XXXX test. The session will be closed. The OP – XXXX will then be opened. The OVI set to run repeatable audio and the OVO will be set to run in shoe shine mode for duration of the OP – XXXX. At the conclusion of the OP – XXXX test the session will be closed and a report will be produced. The POST – XXXX precinct will be opened. OVI will be voted in a predetermined voting pattern. The ballots will be scanned into OVO. The POST – XXXX test
will be closed. At the conclusion of all hardware tests, the data will be pulled back into the EMS for consolidation and reporting.

- 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: No
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: No
- Early Voting: Yes

Logic and Accuracy
This test must exercise all possible voting positions for this ballot. There are 184 possible positions per ballot. OVI will be used to create a test deck for the OVO as a pre-test activity. All OVI "Test Deck" ballots will be scanned back into OVO. Unisyn will provide professional ballots on 17 inch card stock for addition ballots. The OVI will be utilized to cast one audio vote per hour during the duration of the test. The OVI "Test Deck" will be fed at a rate of no less than 100 ballots per hour in addition 10 pre-marked professionally printed ballots will be cast.

- 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

6.2 Test Set-Up (continued)

- Straight Party voting: Yes
- 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: No
- Early Voting: Yes

Equipment: 3 OVO units, 3 OVI units for test deck creation and testing, 60 printed ballots, XXX rolls of OVI paper

General Election: GEN-01
A basic election held in 4 precincts one of which is a split precinct. This election contains 19 contests compiled into four ballot styles. Five of the contests are in all four ballot styles. The other 15 contests are split between at least two of the precincts with a maximum of four different contest spread across the four precincts. The voting variations supported by this election are as follows:

- 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: 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

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. Test Pattern 8 was chosen for audio input in an alternative language because it is a basic voting pattern using an ADA device. Test pattern 9 was chosen for audio input to demonstrate support for write-in voting using an ADA device. Test Pattern 3 was chosen for Spanish language input because it is a basic vote pattern using Spanish. Test Pattern 10 was chosen for Spanish language input because it exercises write-in using Spanish.

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 15 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. The voting variations supported by this election are as follows:

- 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

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 election will be an early voting election with at least one machine running all precincts. Voting options for overvoting and undervoting will be exercised. Ballots 7 and 16 were selected for Spanish based language input. Ballots 13 and 17 were selected for casting of ballot using the ADA Audio capability.

General Election: GEN-03
A basic election held in two precincts. This election contains 8 contests and compiled into two ballot styles. Four of the contests are in both ballot styles. The other four contests are split between the two precincts. The voting variations supported by this election are as follows:

- 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

6.2 Test Set-Up (continued)

- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

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. Test patterns 3 and 4 were chosen for input in the Spanish language because they are a basic voting pattern with a write-in. Test patterns 5 and 6 were chosen for audio input using the Spanish language to demonstrate support for write-in voting using an ADA device with and alternative language. Test pattern 7 was chosen for character-based language input because it is a basic vote pattern using Chinese. Test pattern 8 was chosen for character-based language using an ADA device to demonstrate support for character-based ADA device support.

Test pattern 9 was chosen for binary input to show support for ADA binary input device. Test pattern 10 was chosen for binary input using ADA audio deceive to show support for binary input and ADA support.

Primary Election: PRIM-01
An open primary election in 2 precincts. This election contains 30 contests compiled into five ballot styles. Each ballot style contains six contests. The voting variations supported by this election are as follows:

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

This election designed to functionally test an open primary with multiple ballot styles, support for two languages, and support for common voting variations. Test patterns 5 and 18 are input in an alternative language. Test patterns 8 and 18 are input using an ADA audio device. These patterns were select to exercise the write-in functionality in a primary election.

Primary Election: PRIM-02
A basic election held in two precincts. This election contains 13 contests compiled into three ballot styles. One contest is in all three ballot styles; all other contests are independent. The voting variations supported by this election are as follow:

6.2 Test Set-Up (continued)

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

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 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. Ballots 5 and 18 were selected for Spanish based language input. Ballots 8 and 17 were selected for casting of ballot using the ADA Audio capability.

Primary Election: PRIM-03
A basic election held in two precincts. This election contains 10 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. The voting variations supported by this election are as follows:

- 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

6.0 TEST PROCEDURES AND CONDITIONS (continued)

6.2 Test Set-Up (continued)

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. Test patterns 3 and 4 were chosen for input in the Spanish language because it is a basic voting pattern with a write-in. Test patterns 5 and 6 were chosen for audio input using the Spanish language to demonstrate support for write-in voting using an ADA device with and alternative language. Test pattern 7 was chosen for Ideographic based language input because it is a basic vote pattern using Chinese. Test pattern 8 was chosen for character based language using an ADA device to demonstrate support for Ideographic based ADA device support. Test pattern 9 was chosen for binary input to show support for ADA binary input device. Test pattern 10 was chosen for binary input using ADA audio deceive to show support for binary input and ADA support.

6.3 Test Sequence

The components of the OVS will undergo all hardware software tests described in the 2005 VVSG. The following is a list of tests and a brief description of each hardware and software test and a planned sequence along with the location of each test:

6.3.1 Hardware Test Description

Electromagnetic Radiation – This test verifies that radiated and conducted emissions from the voting system hardware do not exceed the allowable limits of CFR 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).

Low Temperature – This requirement addresses a range of tests for voting machines and precinct counters, as such devices are stored between elections and are transported between the storage facility and polling place, to meet specific minimum performance standards for low temperatures.

Vibration – This requirement addresses a range of tests for voting machines and precinct counters, as such devices are stored between elections and are transported between the storage facility and polling place, to meet specific minimum performance standards for vibration.

Lightning Surge – This test demonstrates the voting system's hardware to withstand power line lightning surges during normal operation. This test is equivalent to the procedure of IEC 61000-4-5. The test for lightning surge protection shall be conducted in compliance with the test specified in IEC 61000-4-5 (Volume II, Section 4.8.f).

High Temperature – This test addresses a range of tests for voting machines and precinct counters, as such devices are stored between elections and are transported between the storage facility and polling place, to meet specific minimum performance standards for high temperature.

Bench Handling – The bench handling test simulates stresses faced during maintenance and repair of voting machines and ballot counters.

Electrical Fast Transient – This test demonstrates the voting system's hardware to withstand electrical fast transients during normal operation. This test is equivalent to the procedure of IEC 61000-4-4. The test for

electrical fast transient protection shall be conducted in compliance with the test specified in IEC 61000-4-4 (Volume II, Section 4.8.e).

6.0 TEST PROCEDURES AND CONDITIONS (continued)

6.3.1 Hardware Test Description (continued)

Humidity Test – This requirement addresses a range of tests for voting machines and precinct counters, as such devices are stored between elections and are transported between the storage facility and polling place, to meet specific minimum performance standards.

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).

Electromagnetic Susceptibility – This test demonstrates 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).

Electrical Power Disturbance – This test demonstrates the voting system's hardware to withstand power disturbances during normal operation. This test is equivalent to the procedure of IEC 61000-4-11. Volume I, Section 4.1.2.5. The test for power disturbance disruption shall be conducted in compliance with the test specified in IEC61000-4-11(Volume II, Section 4.8.a)

Temperature Power Variation – The Environmental Test, Operating, subjects the system hardware to varying temperatures and voltages, demonstrating hardware/data recording accuracy reliability Mean-Time-Between-Failure (MTBF) of 163 hours.

Safety – All voting systems shall meet the following requirements for safety:
a. All voting systems and their components shall be designed to eliminate hazards to personnel or to the equipment itself.
b. Defects in design and construction that can result in personal injury or equipment damage must be detected and corrected before voting systems and components are placed into service.
c. Equipment design for personnel safety shall be equal to or better than the appropriate requirements of the Occupational Safety and Health Act, Code of Federal Regulations, Title 29, Part 1910.

Maintainability – Maintainability represents the ease with which preventive and corrective maintenance actions can be performed based on the design characteristics of equipment and software and the processes the manufacturer and election officials have in place for preventing failures and for reacting to failures.

Electrical Supply – This requirement addresses the battery power source for providing electrical supply during a power failure.

6.0 TEST PROCEDURES AND CONDITIONS (continued)

6.3.1 Hardware Test Description (continued)

Table 6.3.1-1 OpenElect Voting System Hardware Test Sequence

Test	Procedure/Description	Location	Specimen
Electromagnetic Radiation	FCC Part 15 Class B for both radiated and conducted emissions	EMI Lab	OVO EUT 1 OVI EUT 1
Low Temperature	MIL-STD-810D minimum temperature shall be -4 degrees F	Environmental Lab	OVO EUT 2 OVI EUT 2
Vibration	MIL-STD-810D, Meth0d 514.3 physical shock and vibration during handling and transport	Dynamics Lab	OVO EUT 4 OVI EUT 4
Lightning Surge	IEC 61000-4-5 (1995-02)	EMI Lab	OVO EUT 1 OVI EUT 1
High Temperature	MIL-STD-810D, Method 501.2 maximum temperature shall be 140 degrees F	Environmental Lab	OVO EUT 2 OVI EUT 2
Bench Handling	MIL-STD-810D, Method 516.3 Procedure VI six 4" drops on each edge totaling 24 drops	Dynamics Lab	OVO EUT 4 OVI EUT 4
Electrical Fast Transient	IEC 61000-4-4	EMI Lab	OVO EUT 1 OVI EUT 1
Humidity Test	MIL-STD-810D, Method 501.2 ten 24 hour humidity cycles	Environmental Lab	OVO EUT 2 OVI EUT 2
Electrostatic Disruption	IEC 61000-4-2 (1995-01) 15kV air discharge and 8kV contact discharge	EMI Lab	OVO EUT 1 OVI EUT 1
Electromagnetic Susceptibility	IEC 61000-4-3 electromagnetic field of 10V/m modulated by a 1kHZ, 80% AM modulation at 80MHz to 1000MHz frequency	EMI Lab	OVO EUT 1 OVI EUT 1
Conducted RF Immunity	IEC 61000-4-6 (1996-04) conducted radio frequency energy	EMI Lab	OVO EUT 1 OVI EUT 1
Magnetic Fields Immunity	IEC 61000-4-8 (1993-06) AC magnetic fields of 30 A/m at 60Hz	EMI Lab	OVO EUT 1 OVI EUT 1
Electrical Power Disturbance	IEC 61000-4-11 (1994-06) power surges and dips	EMI Lab	OVO EUT 1 OVI EUT 1
Temperature/Power Variation	MIL-STD-810D, Method 502.2 and Method 501.2 163 hours at 50 degrees to 95 degrees	Environmental Test Chamber	OVO EUT 1-4 OVI EUT 1-4
Safety	UL 60950-1 product safety review	Product Safety Lab	OVO EUT 3 OVI EUT 3
Maintainability	The ease with which preventive maintenance actions can be performed	Product Safety Lab	OVO EUT 3 OVI EUT 3
Electrical Supply	Meets voltage and power requirements of 2005 VVSG Vol. 1 Section 4.1.2.4	Product Safety Lab	OVO EUT 3 OVI EUT 3

6.0 TEST PROCEDURES AND CONDITIONS (continued)

6.3.2 Software Test Description

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

6.0 TEST PROCEDURES AND CONDITIONS (continued)

6.3.2 Software Test Description (continued)

maintenance. Any information relevant to the system evaluation shall be submitted to include source code, object code, and sample output report formats.

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. Source code inspection shall also assess the extent to which the code adheres to the requirements in Volume I, Section 5.

Compliance Build of the OS – The compliance build of the OS is required for this test campaign. Unisyn uses CentOS as the operating system for OCS, OVO, and OVI. Each individual operating system is tailored to the hardware it runs on. A total of three operating system installation disks will be created by Wyle personnel using the build documentation provided by Unisyn.

Compliance Build of OCS, OVO, OVI, and OVCS – Before testing can begin, a compliance build of all the application will be constructed by Wyle personnel using the build environment, build documentation and reviewed source code. This is to insure the software being tested is constructed from the same source code that was reviewed.

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

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. 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.

6.0 TEST PROCEDURES AND CONDITIONS (continued)

6.3.2 Software Test Description (continued)

Baseline of CentOS – Wyle will review the submitted NIST SCAP FDCC checklist for the Redhat operating system by Unisyn. CentOS is a freeware version of the Redhat operating system. The review will be performed for completeness, clarity, and consistency.

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 will be conducted to insure all applicable 2005 VVSG requirements are met.

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 restoration of the device gracefully from the failures. Testing will include powering units off while operating, disconnecting various cables and components to ensure operation once restored. B

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

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 the Unisyn in the TDP to go beyond 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 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 2005 VVSG.

Volume/Stress/Reliability – The volume/stress/reliability test is designed to test the systems ability to process more data at a high rate then is expected with in the Mean Time Between Failure (MTBF) ratio.

Logic and Accuracy – The logic and accuracy test insures the voting system can process 1,549,703 consecutive ballot positions correctly with in the Mean Time Between Failure (MTBF) ratio.

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.

6.0 TEST PROCEDURES AND CONDITIONS (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 6.3.2-2 OpenElect Voting System Software and System Testing Sequence

Test	Description	Procedure	Test Level	Specimen	Election Data
Technical Data Package (TDP) Review *(Pre-testing Activity)*	Documentation review for compliance, correctness, and completeness	WHVS07.1 WOP 3	Document	TDP package	
Compliance Source Code Review *(Pre-testing Activity)*	Source code review for compliance	WHVS07.2 WOP 5a	Component	OpenElect Source Code Package	
Compliance Build of CentOS	Using the build documents and source code to construct the OS for OCS, OVO, & OVI	WHVS07.06 WOP 7	Component	OpenElect Source Code Package and COTS products	
Compliance Build of OCS, OVO, and OVI	Using the build documents and source code to construct the OCS, OVO, & OVI	WHVS07.3 WOP 25	Component & System	OVS	
Physical Configuration Audit	Audit hardware and software models and versions	WHVS07.3 WOP 25	Component & System	OVS	
Source Code COTS Review	Source code review to examine third party products for modification and versions	WHVS07.2 WOP 5d	Component	OpenElect Source Code Package	
Baseline Centos OS 5.0	RFI 2008-03 OS Configuration	WHVS07.3 WOP 25	Component	EMS PC/Laptop OVO EUT 5 OVI EUT 5	
Functional Configuration Audit	Functional testing to the system documentation and 2005 VVSG requirements	WHVS07.4 WOP 26 WOP30a	Component & Integration	OCS CONFIG 2 OVO EUT 5 OVI EUT 5	Gen-01 Prim -01
Source Code Functional Review	Source code review for functionality and high level software design	WHVS07.2 WOP5b	Component & Integration	OpenElect Source Code Package	
Source Code Security Review (manual – automated)	Source code review for specific security concerns and an automated review using Fortify	WHVS07.2 WOP5d WOP 6a	Component & Integration	OpenElect Source Code Package	

6.0 TEST PROCEDURES AND CONDITIONS (continued)

6.3.2 Software Test Description (continued)

Table 6.3.2-2 OpenElect Voting System Software and System Testing Sequence (continued)

Telecommunication	Test of telecommunication technology of the system for accuracy and correctness	WHVS07.6 WOP 31	Integration & System	OCS CONFIG 2 OVO EUT 5 OVI EUT 5	Gen-01
Usability/Accessibility	Test of effective use of OVS.	WOP 22 WOP 24-1 WOP 24-1a WOP 24-1b WOP 24-1c WOP 24-1d WOP 24-1f WOP 24-1g WOP 24-2 WOP 24-2a WOP 24-2b WOP 24-2c WOP 24-2d WOP 24-2e WOP 24-2f	Integration	OCS CONFIG 3 OVO EUT 5 OVI EUT 5	Gen-01 Prim -01
Volume, Stress, & Reliability Test	Test to investigate the system's response to larger amounts of data than it is expecting.	WOP 21	System	OCS CONFIG 2 OVO EUT 5 OVI EUT 5	Los Angeles City (Unisyn definition)
Logic and Accuracy (Temp Power)	Test of accuracy to ~1.6 million ballot positions	WHVS07.9 WOP 30	System	OCS CONFIG 3 OVO EUT 1,2,3,4 OVI EUT 1,2,3,4	L & A Election
System Integration Test	Test of all system hardware, software and peripherals.	WOP 30	System	OCS CONFIG 1,2,3 OVO EUT 1,2,5 OVI EUT 5	Gen-01 Gen-02 Gen-03 Prim-01 Prim-02 Prim-03
Trusted Build	Creation and installation of the final system software	WHVS07.6 WOP 7 WOP 7a	Component	OpenElect Source Code Package	

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 of 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.

7.0 TEST OPERATIONS PROCEDURES (continued)

7.1 Proprietary Data (continued)

Table 7-1 Proprietary Data

Document/Data	Scope Of Restriction
\Proprietary\Election Definitions	Entire Directory Privileged
\Proprietary\Procedures	Entire Directory Privileged
\Proprietary\Test Cases	Entire Directory Trade Secret
\Proprietary\Wyle's EAC Matrix	Entire Directory Trade Secret
TDP	04_00444 System Functionality Description (Trade Secret)
TDP	04-00445 Personnel Training and Deployment Req (Trade Secret)
TDP	04-00447 System Security Specifications (Trade Secret)
TDP	04-00448 Configuration Management Plan (Trade Secret)
TDP	04-00449 System Coding Standards (Trade Secret)
TDP	04-00452 2005 VVSG Vendor Testing and TDP Trace (Trade Secret)
TDP	04-00453 System Test and Verification Plan (Trade Secret)
TDP	03-00469 Final QA Report (Trade Secret)
TDP	04-00458 System Hardware Specification (Trade Secret)
TDP	04-00464 Software Design and Specification (Trade Secret)
TDP	04_00498 Trusted Build OVO Linux (Trade Secret)
TDP	04_00499 Trusted Build OVI Linux (Trade Secret)
TDP	04_00500 Trusted Build OCS Linux (Trade Secret)
TDP	04_00501 Trusted Build OVCS Linux (Trade Secret)
TDP	04_00502 Trusted Build Application (Trade Secret)
TDP	03-00456 OVO Functional Test Cases (Trade Secret)
TDP	03-00468 OVO Election Test Cases (Trade Secret)
TDP	03-00473 Ballot Layout Manager Test Cases (Trade Secret)
TDP	03-00474 Tabulator Test Cases (Trade Secret)
TDP	03-00475 Tabulator Reports Test Cases (Trade Secret)
TDP	03-00476 Election Server Test Cases (Trade Secret)
TDP	03-00477 Tabulator Client Test Cases (Trade Secret)
TDP	03-00478 Election Manager Test Cases (Trade Secret)
TDP	03-00479 Software Server Test Cases (Trade Secret)
TDP	03-00472 OVI Unit Test Cases (Trade Secret)
TDP	03-00480 OVCS Test Cases (Trade Secret)
TDP	03-00497 OVS HW Test Cases (Trade Secret)
TDP	Table Of Contents (Trade Secret)
TDP	04_00444 System Functionality Description (Trade Secret)

7.0 TEST OPERATIONS PROCEDURES (continued)

7.1 Proprietary Data (continued)

Table 7-1 Proprietary Data (continued)

TDP	04-00445 Personnel Training and Deployment Req (Trade Secret)
TDP	04-00447 System Security Specifications (Trade Secret)
TDP	04-00448 Configuration Management Plan (Trade Secret)
TDP	04-00449 System Coding Standards (Trade Secret)
TDP	04-00452 2005 VVSG Vendor Testing and TDP Trace (Trade Secret)
TDP	04-00453 System Test and Verification Plan (Trade Secret)
TDP	03-00469 Final QA Report (Trade Secret)
TDP	04-00458 System Hardware Specification (Trade Secret)
TDP	04-00464 Software Design and Specification (Trade Secret)
TDP	04_00498 Trusted Build OVO Linux (Trade Secret)
TDP	04_00499 Trusted Build OVI Linux (Trade Secret)
TDP	04_00500 Trusted Build OCS Linux (Trade Secret)
TDP	04_00501 Trusted Build OVCS Linux (Trade Secret)
TDP	04_00502 Trusted Build Application (Trade Secret)
TDP	03-00456 OVO Functional Test Cases (Trade Secret)
TDP	03-00468 OVO Election Test Cases (Trade Secret)
TDP	03-00473 Ballot Layout Manager Test Cases (Trade Secret)
TDP	03-00474 Tabulator Test Cases (Trade Secret)
TDP	03-00475 Tabulator Reports Test Cases (Trade Secret)
TDP	03-00476 Election Server Test Cases (Trade Secret)
TDP	03-00477 Tabulator Client Test Cases (Trade Secret)
TDP	03-00478 Election Manager Test Cases (Trade Secret)
TDP	03-00479 Software Server Test Cases (Trade Secret)
TDP	03-00472 OVI Unit Test Cases (Trade Secret)
TDP	03-00480 OVCS Test Cases (Trade Secret)
TDP	03-00497 OVS HW Test Cases (Trade Secret)
TDP	Table Of Contents (Trade Secret)
Appendix D Physical Configuration Audit	Appendix A Trade Secret (Security)