Certification Test Report

Report Number TR-012011-DOM-01

Test Report v 1.0

June 8, 2012

Prepared for:

Vendor Name	Dominion Voting Systems
Vendor System	WinEDS 4.0
EAC Application No.	SEQ-40-2007-W1
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NVLAP LAB CODE 200733-0

Accredited by the National Institute of Standards and Technology (NIST) National Voluntary Lab Accreditation Program (NVLAP), and accredited by the Election Assistance Commission (EAC) for VSTL status.

Revision History

Release	Author	Revisions
0.1	D George	Initial Draft
1.0	D George	First Submission to EAC

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The tests referenced in this document were performed in a controlled environment using specific systems and data sets, and results are related to the specific items tested. Actual results in other environments may vary.

Opinions and Interpretations

Any opinions or interpretations included in this report shall be marked as such, starting with "It is SLI's opinion/interpretation…" An EAC interpretation was applied to this VSTL test effort (describe) OR There are no opinions or interpretations included in this report.

Other Labs Performing Hardware Testing

SLI Global Solutions is responsible for all core voting system tests as identified in NIST NVLAP Handbook 150-22 (2008). The labs listed below performed non-core hardware testing for this certification test campaign.

Laboratory	Address	Test(s)	Date(s)
EMC Integrity	1736 Vista View Drive, Longmont CO 80504	Electromagnetic Immunity Tests	9/7/2011 – 9/9/2011

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1 Introduction

SLI Global Solutions is submitting this report as a summary of the Volume and Hardware testing efforts for the Sequoia WinEDS 4.0 voting system components, as detailed in the section 3 'System Identification'. The purpose of this document is to provide an overview of the testing conducted and present the findings.

The test effort consisted of the development of a test plan, managing system configurations, executing specific focused Volume test cases, development of a Hardware Test Plan, and 3rd party hardware testing on the identified WinEDS 4.0 voting system components. All testing was conducted against the 2002 Voting System Federal Standards (VSS).

SLI is a full service third party testing facility, founded in May 1996, from a software test-consulting firm. The specific system testing services offered include:

- Test Planning and Test Management
- eBusiness, Client-Server and Stand-alone Application Functional, Compatibility and Regression Testing
- eBusiness and Client-Server Load and Performance Testing
- Automated Regression Test Development, Consulting, Scripting and Execution
- Complex, Integrated Test Solutions and Automated Test Harnesses
- Independent Verification and Validation
- EAC approved and NIST NVLAP accredited Voting System Test Laboratory

1.1 References

1. Election Assistance Commission 2002 Voting System Federal Standards (VSS). Volumes I and II.
2. NIST NVLAP Handbook 150: 2006.
3. NIST NVLAP Handbook and 150-22: 2008.
4. EAC Testing and Certification Program Manual, United States Election Assistance Commission, 2007
5. SLI VSTL Quality System Manual, version 1.14 prepared by SLI, dated 11/28/2011.

1.2 Document Overview

This document contains:

- The Introduction which discusses the system tested
- The Test Background which describes the testing process and methods
- The System Identification which identifies all hardware and software components for the Sequoia WinEDS 4.0 voting system configuration tested
- The System Overview which discusses the functionality of theSequoia WinEDS 4.0 voting system software and firmware
- The Testing Performed which are a summary of the testing effort
- The Test Results which are a summary of the test results
- The Recommendations section which contains the final analysis of the testing effort and recommendation to the EAC
- EAC Certification Number & Voting System Configuration lists the EAC issued Certification Number, once it is awarded
- Appendices:
    - Appendix A – Test Plan – incorporated by reference
- Attachments which contain:
    - Attachment A – List of Technical Data Package (TDP) Deliverables
    - Attachment B –Functional Discrepancy Report
    - Attachment C – Accredited Hardware Test Lab Certification
    - Attachment D – Hardware Test Plans
    - Attachment E – Hardware Testing Results from Hardware Test Laboratories

1.3 Terms and Abbreviations

The following terms and abbreviations will be used throughout this document:

Table 1 – Terms and Abbreviations

Term	Abbreviation	Description
American Association for Laboratory Accreditation	A2LA	A nonprofit, non-governmental, public service, membership society whose mission is to provide comprehensive services in laboratory accreditation and laboratory-related training.
Central Count Scanner	CCS	High Speed Optical Scanner is a mark sense-based ballot and vote counting device typically located at a central count facility and is operated by an automated multi-sheet feeding capability.
Compact Flash card	CF	This is a type of flash memory card in a standardized enclosure often used in voting systems to store ballot and/or vote results data.
Commercial Off the Shelf	COTS	Term used to designate computer software, hardware or accessories that are ready-made and available for sale, lease, or license to the general public
Election Assistance Commission	EAC	An independent, bipartisan commission created by the Help America Vote Act (HAVA) of 2002 that operates the federal government's voting system certification program.
Election Management System	EMS	Typically a database management system used to enter jurisdiction information (district, precincts, languages, etc.) as well as election specific information (races, candidates, voter groups (parties), etc.). In addition, the EMS is also used to layout the ballots, download the election data to the voting devices, upload the results and produce the final results reports.
Direct Recording Electronic	DRE	Voting systems that, using Touch Screen or other user interfaces, directly record the voter's selections in each race or contest on the ballot in electronic form.
Electromagnetic Compatibility	EMC	The goal of EMC is to validate the correct functioning of different equipment in the same environment and the avoidance of any interference effects between them.
Functional Configuration Audit	FCA	The testing activities associated with the functional testing of the system.

Term	Abbreviation	Description
Independent Test Authority	ITA	This is a test lab that is not connected with the vendor or manufacturer of the voting system.
Institute of Electrical and Electronics Engineers	IEEE	A non-profit organization, IEEE is the world's leading professional association for the advancement of technology.
National Institute of Standards and Technology	NIST	A non-regulatory federal agency within the U.S. Dept. of Commerce. Its mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.
National Voluntary Laboratory Accreditation Program	NVLAP	A division of NIST that provides third-party accreditation to testing and calibration laboratories.
Precinct Count Scanner	PCS	A precinct-count optical scanner is a mark sense-based ballot and vote counting device located at a precinct and is typically operated by scanning one ballot at a time.
Request For Information	RFI	A form used by testing laboratories to request, from the EAC, interpretation of a technical issue related to testing of voting systems.
Technical Data Package	TDP	This is the data package that is supplied by the vendor and includes: Functional Requirements, Specifications, End-user documentation, Procedures, System Overview, Configuration Management Plan, Quality Assurance Program, and manuals for each of the required hardware, software, firmware components of each voting system.
Voting System Standards Volumes 1 & 2	VSS	A set of specifications and requirements against which voting systems can be tested to determine if the systems provide all of the basic functionality, accessibility and security capabilities required of these systems.
Voting System Test Lab	VSTL	This is the lab where the voting system is being tested.
Voting System Under Test	VSUT	The designation for a voting system that is currently being tested.
Voting Test Specialist	VTS	An SLI employee within the Compliance division that has been qualified to perform EAC voting system certification testing.

2 Test Background

2.1 Functional Testing

The SLI developed Volume Test Suite was customized for the Sequoia WinEDS 4.0 voting system and conducted in accordance with *Volume 2 Section 6,* for use in executing the volume test. A simulation of election scanning was conducted to demonstrate a volume use case process for the Sequoia WinEDS 4.0 system.

2.1.1 Test Methods

SLI leveraged an internal laboratory developed and validated Test Method as the basis for creation of the Test Suite used in testing. All test methods employed are within the scope of SLI's VSTL accreditation.

The following Test Method was utilized as the basis for creating the customized Test Suite for this test campaign

- TM_Volume v0.14

The above listed test method was implemented in a complementary fashion: modules are employed from the Test Method to form the suite. The suite included a logical sequence of functionality that is used to validate the requirement addressed by each module within the suite.

2.1.1.1 Deviations from, additions to, or exclusions from the test methods

There were no deviations from, additions to, or exclusions from the test method used in this volume test effort.

2.1.1.2 NOCs and RFIs applied to testing

The following NOC/RFI's were applied during testing per the SLI approved Test Method:

- There were No NOC/RFI specific to Volume Testing

2.2 Hardware Testing

The Dominion Sequoia Edge2Plus Model 300, HAAT90, and HAAT100 were tested to the Federal Election Commission (FEC) 2002 Voting System Standards (VSS) in the area of Electromagnetic Immunity for Electrostatic Disruption (ESD).

SLI used a 3rd party Hardware Testing laboratory EMC Integrity, a NVLAP accredited lab to perform ESD testing.

2.2.1 Test Method

The equipment under test (EUT) was conducted in accordance with the methods specified by IEC 61000-4-2, Edition.2 (2008). Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand ±15 kV air discharge and ±8 kV contact discharge without damage or loss of data. The equipment may reset or have momentary interruption so long as normal operation is resumed without human intervention or loss of data.

The equipment under test (EUT) is to be installed in accordance with the manufacturer's instructions. The installation process includes, product assembly, connecting any support equipment, connecting power and configuration of the equipment under test. All unused ports should be terminated as instructed by the test standard. The EUT should indicate normal operation in accordance with the Operation Manual.

2.2.1.1 NOCs and RFIs applied to HW testing

The following NOC/RFI's were applied during HW testing per the SLI approved Test Method:

- Election Assistance Commission: NOC 07-05: Voting System Test Laboratory (VSTL) responsibilities in the management and oversight of third party testing.
- Election Assistance Commission: NOC 08-001: Validity of Prior Non-Core Hardware Environmental and EMC Testing.
- Election Assistance Commission: Decision on Request for Interpretation 2010-01 Voltage Levels and ESD Test.

3 System Identification

The Sequoia WinEDS 4.0 voting system was submitted for testing with the documentation, hardware and software listed below. No other Sequoia product was included in this test effort.

3.1 Documentation

SLI utilized system documentation submitted as the Technical Data Package (TDP) to assist in the development of the Test Suites. Included in the TDP were User/Owner manuals that would be part of the certified system delivered to a purchaser of the system. For a detailed list of all documentation referenced as part of this test campaign see Attachment A.

3.2 Software and Firmware

The software and firmware employed by the Sequoia WinEDS 4.0 voting system consists of 2 types, custom and commercial off the shelf (COTS). COTS applications were verified to be pristine, or were subjected to source code review for analysis of any modifications and verification of meeting the pertinent standards.

The following software/firmware was used for the execution of hardware and software tests. This includes all supporting software such as operating systems, compilers, assemblers, application software, firmware, and any applications used for burning of media, transmission of data or creation/management of databases.

Tables 2 and 3 below detail each application employed by the Sequoia WinEDS 4.0 voting system in this test effort.

Table 2 – Manufacturer Software and Firmware

Manufacturer	Application	Version
Sequoia	WinEDS	4.0.175
Sequoia	WinETP	1.16.15
Sequoia	Edge2plus	1.2.74
Sequoia	HAAT 90	2.6.34
Sequoia	HAAT 100	2.6.34
Sequoia	HAAT Listener	1.7.4

Table 3 – COTS Software and Firmware

Manufacturer	Application	Version
Microsoft	Windows XP Pro (service pack 3)	2002
Microsoft	Windows XP Pro (service pack 2)	2002
Microsoft	Windows Server, R2-Standard Edition (service pack 2)	2003
SUSE	Linux Enterprise Server 10 (service pack 1)	
SUSE	Linux Enterprise Server 10 (service pack 1)	

3.3 Equipment (Hardware)

The hardware employed by Sequoia WinEDS 4.0 voting system consists of 2 types, custom and commercial off the shelf (COTS). COTS hardware was verified to be pristine, or was subjected to review for analysis of any modifications and verification of meeting the pertinent standards.

The following equipment was used for the execution of the Hardware and Volume tests. This includes system hardware, general purpose data processing and communications equipment, and any test instrumentation required.

Tables 4 and 5 below detail each device employed by the Sequoia WinEDS 4.0 voting system.

Table 4 – Manufacturer Equipment

Manufacturer	Hardware	Model	Revision
Sequoia	Optech 400-C	3.02	Rev. 3.02P
Sequoia	Edge2plus	300	Rev. C0.4
Sequoia	HAAT	100	Rev. A0.7
Sequoia	HAAT	90	Rev. A1.1

Table 5 – COTS Equipment

Manufacturer	Hardware	Model & Part Information
400-C Equipment		
Dell	LCD Monitor	E198WFP
Dell	Dell CPU	Part No. 6GV4D91,

Manufacturer	Hardware	Model & Part Information
		Rev No. A01
Logitech	USB Mouse	Part No. 804360-1000
Dell	Keyboard	Part No. 025PGG, Rev No. A00, Serial No. TH-025PGG-37171-0AQ-4933
Not listed	3M Static Dissipative Floor Mat	8203 98-0798-0787-5
Not listed	3M Dissipative Table Mat	8213 98-0798-1201-6
APC Smart-UPS	UPS	2200
Woodhead filter	Voltage Filter (UPS)	Part 89IL
HAAT90/100 Equipment		
Micro Seven	Mini PBX Simulator	LS200-8A
Dell	Laptop Intel Pentium (cartridge creation at the ESD lab)	Latitude D610
Dell	PowerEdge 1900 (WinEDS Server)	1900
Dell	PowerEdge 840 - RAS Server (HAAT90)	840
Dell	PowerEdge 2900 – (HAAT90 Linux Listener)	2900
3COM	3C17304 Superstack 3 Switch	4228G
Dell	Monitor	E198WFP
Trend Net	KVM Switch	TK-407
Sycard	PCCextend - CARDBUS	70A
Dell	Keyboard	SK-8115, Part No. CD-0DJ331-71616-7CQ-022J, Rev No. A03,
Dell	USB Mouse	0DJ301, Part No. HC7010A1536
Dell	USB Mouse	0XN967, Part No. G1701WCQ
Digital Concepts	Multi-Slots 21-in-1 Card Reader	CR-70A

3.4 Materials

Items identified in the table reflect the materials used in performing the hardware and volume tests in a manner that reflects real world use and needs.

Table 6 –Test Materials

Manufacturer	Type of Material
Dominion	Pre-defined Election Definition
Dominion	Pre-printed Ballots (2 sets)
Dominion	Voter Cards
Dominion	USB Cartridge
Dominion	Ballots (Test Deck)
Dominion	Ballots (26,000+/- Production Ballots x 2 sets)
Dominion	E2P UTG Paper Rolls 3 1/8” (UTG300 58-400)

4 System Overview

The following is a description of the components of system tested and how they integrate together to complete the Sequoia WinEDS 4.0 voting system.

4.1 Scope of the Voting System

This section provides a brief definition of the scope of WinEDS 4.0 voting system components required for testing:

- **400-C** is a high-speed, central optical scan ballot counter (tabulator) used for processing of absentee and early vote ballots (such as vote by mail). The unit is run by custom-made ballot processing application software. It is used for centralized scanning and counting a high volume of paper ballots at high speed.
- **EMS: WinEDS** is the software utilized for election definition and database creation.
- **WinETP** is the software used for tabulation and reporting of election results.
- **HAAT 90** is an electronic table top Activator, Accumulator, and Transmitter. The HAAT 90 is used to create voter cards, consolidate and transmit data. EUT is equipped with a wire line modem.
- **HAAT 100** is an electronic table top Activator, Accumulator, and Transmitter. The HAAT100 is used to create voter cards, consolidate and transmit data. EUT is equipped with a wireless device.
- **Edge2Plus 300** is an electronic floor standing voting machine. The voter uses a touch screen to select candidates and answer Yes or No questions. The unit has a printer to provide a hard copy of the items that were selected. A voter inserts a voting card that activates the voting machine. After the activation, the voter follows the instructions on the touch screen. The unit has a hand device that is used by the disabled voter. The hand piece provides output jacks for an audio headset, push button and blow button. The headset, push button and blow button are not supplied by the manufacturer. The voter supplies the accessories.

4.2 System Review

This section describes the workings of the Sequoia WinEDS voting system and the flow of data and system processes.

The WinEDS voting system is a full featured voting system capable of handling a variety of election types. The election management system software WinEDS 4.0 is used for election definition and database & ballot definition creation for General, Open

Primary and Closed Primary elections. Once election data is created through the WinEDS software, it is installed on the Edge2plus DRE and Optech 400-C central count voting devices. Ballots created from the EMS election definition are scanned on the Edge2plus DRE and Optech 400-C devices, accumulating vote data. The Hybrid Activator, Accumulator & Transmitter (HAAT 100 & 90) devices are used to tabulate and transmit vote data to the WinETP consolidation, tabulation and reporting software installed and configured on a workstation.

5 Testing Performed

5.1 Configurations Tested

The following configurations were used during testing. All set up was conducted per the manufacturers recommended configuration.

5.1.1 Volume Testing

SLI initially emulated the Central Count setup provided by the manufacturer's documentation. The following configuration was set up and utilized during initial phase of testing:

1. An EMS workstation with the WinEDS software installed & configured (utilized only to provide the election definition files for use with the WinETP software). The Optech 400-C central count high speed scanner in a standard office environment, carpeted with building controlled Airflow and humidity level.

After encountering a high amount of static discharge from the 400c the manufacturer reviewed the test environment and recommended changes to the following test environment during additional testing:

2. The Test Environment was configured with a 400c scanner and ballot catcher cart both placed on 3M anti-static mats. The anti-static mats were grounded to the 400c scanner and the 400c was grounded directly to a building outlet. In addition, the cart was grounded directly to the 400c scanner. The 400c was connected to a 120v UPS and the UPS was connected to a Voltage Filter that was directly connected to the buildings power outlet. The test room consisted of a tiled floor and was maintained at 35% Humidity throughout the duration of the test.

   The specific environmental configuration is documented by the vendor in the Maintenance Manual – 400-C_MaintMan_1_16 (Appendix B – Acceptance Testing Procedure, pgs. B3 – B5.)

5.1.2 Hardware ESD Testing

Hardware testing at the 3rd party HW lab utilized the following devices independently for HW testing:

- The Edge2plus DRE voting device
- The HAAT 100 Activator, Accumulator & Transmitter
- The HAAT 90 Activator, Accumulator & Transmitter

5.2 Functional Test Method

The voting system functionality was tested using the SLI developed Test Method as identified in the Tests table below. The following functional areas were identified as in scope for the Sequoia WinEDS 4.0 voting system.

Table 7 –Tests

Test Suite name	Test Methods employed
Volume	TM_Volume v0.14

The Volume Test Method involved a series of ballot scans performed until the greater than expected number of ballots was reached on the central count device. The focus of the Volume Test Suite was data handling, throughput, and integrity. During scanning the data passing through the system was tracked and verified to have no adverse affects to the operation of the system. After scanning was completed a detailed verification was performed using audit records to identify all errors logged. Finally, a detailed verification was conducted comparing the WinETP printed reports against vote totals compiled from the pre marked ballots prior to testing.

5.3 Known Vulnerabilities Testing

There were no known vulnerabilities identified prior to testing.

5.4 Hardware Testing

SLI and their environmental hardware test subcontractor, EMC Integrity, performed a review of the (summarized assessment of hardware testing needs and hardware environmental tests to be performed).

The test methodologies for all tests are identified in SLI's VSS EMC EMI Test Plan _ DVS Sequoia WinEDS v2 0 and EMC Integrity Test Reports, Product Data Sheets:

- EDGE2PLUS Model 300, ERB10906 Rev. C, Hardware Test Report
- HAAT100, ERB10904 Rev. B, Hardware Test Report
- HAAT90, ERB10905 Rev. B, Hardware Test Report
- HAAT90, ERB11027, Hardware Test Report

Electrostatic Discharge - Direct and indirect discharge testing was performed on the EUT. Contact discharge testing was performed on selected conductive points of the EUT at levels of ± 2 kV, ± 4 kV, ± 6 kV, and ± 8 kV using 1 pulse per second and 10 discharges per level per polarity. Air discharge was also performed at non-conductive points on the EUT at levels of ± 2 kV, ± 4 kV, ± 8 kV and ± 15 kV. Indirect discharge testing was also performed using a vertical coupling plane and a horizontal coupling plane. Discharge levels were ± 2 kV, ± 4 kV, ± 6 kV and ± 8 kV.

6 Test Results Summary

6.1 Functional Testing Summary & Results

SLI performed tests on each of the system configurations identified in Section 5.1. The testing incorporated Functional and Environmental Hardware scenarios testing the functionality supported by the Sequoia WinEDS 4.0 system.

The Volume Test Suite was successfully executed on the WinETP application as declared in this Test Report for the Sequoia WinEDS 4.0 voting system.

The following findings were encountered during testing and evaluated by SLI staff.

Volume Testing run 1:

1. During scanning multiple ballot out stacks occurred (less the 5% overall). The ballots were re scanned a maximum of 3 additional times and segregated for analysis if not accepted after 4 total scans.

2. During scanning the 400c scanner encountered a ballot jam and required the spoiled ballot to be removed manually. It was determined by SLI that the ballot jam was caused by a misfeed of the paper. The results data integrity was not impacted and this was verified by a visual check of the count number on the WinETP application against numbers being manually tracked by SLI. A dust check was performed and testing was resumed without impact.

3. During scanning a sensor on the 400c failed and halted ballot processing. It was determined by Dominion support and SLI the cable attached to the sensor was bad and would require replacing or the swapping of the 400c device. SLI chose to swap the 400c scanner as this was a faster resolution. The 400c scanner was replaced and the new scanner verified to be operational. The cable failure was deemed by SLI a device malfunction and not an issue with the WinETP application or handling of volume of data and therefore not considered a discrepancy

Analysis:

After the first volume test run and unsuccessful reconciliation of the issues encountered it was suggested by the manufacturer in agreement with the EAC to run "pre scan audit runs" to verify the environment and ballot data being used in testing. Two pre scan runs were executed by SLI and issues were encountered with invalid precincts receiving votes, ballot misreads, and incorrect reading of votes that were not marked. SLI and the manufacturer visually audited the ballots and could not see or verify any issues with the ballots being used in testing. During the pre scan audit runs SLI witnessed numerous static discharges from the 400c device.

It was determined by SLI after input from the manufacturer Dominion that the out stack issues were caused by the numerous reoccurrences of static discharges generated by the 400c. The static discharge was encountered repeatedly buy the tester in the form of physical shocks. These issues were deemed an environmental configuration issue and not discrepancy with the voting system.

It was determined by the manufacturer that the 400c environment was not set up correctly to handle the devices static discharge properly. Dominion provided SLI with new guidance for the test environment recommended setup.

It should be noted that the manufacturer verified the initial test environment prior to the first run

Volume Testing run 2:

SLI reconfigured the test environment per the recommendations of the manufacturer to handle the static discharge issues. The new test environment was verified by both SLI and Dominion personnel prior to the second volume test run (See section 5.1.1 for details n the environment setup).

1. SLI obtained new ballots from the manufacturer and performed 1 pre scan run to verify the ballots and environment. No static discharge was encountered and the pre scan run was successful without any errors encountered. SLI and the manufacturer deemed the ballots and environment to be clean and ready for testing to continue.

2. SLI conducted the Volume Test Run 2 scanning a total of 50,127 ballots through the 400c scanner. During scanning an error was identified where a "NO" vote was cast for a proposition where there was no intentional mark placed on the ballot (see section 6.4 Deficiencies for details). No other issues were identified and all remaining totals were reconciled and found to be accurate.

6.2 Environmental Hardware Test Summary & Results

During execution of ESD testing, a SLI representative was present in order to oversee the test and validate that implementation was as expected. Additionally, the SLI representative performed an operational status prior to and upon completion of each device under test. The operational status check is used to verify that the device is in a known, working state such that all functions and features operate as expected.

The Edge2Plus Model 300, HAAT90, and HAAT100 all complied with ESD requirement IEC 61000-4-2 (2008), Ed. 2.0 requirement. *The test results are provided in the attached reports:*

SLI Hardware Test Report:

- DVS Sequoia WinEDS_2002 VSS Hardware Test Report v3.0

EMC Integrity Hardware Test Reports:

- EDGE2PLUS Model 300, ERB10906 Rev. C, Hardware Test Report
- HAAT100, ERB10904 Rev. B, Hardware Test Report
- HAAT90, ERB10905 Rev. B, Hardware Test Report
- HAAT90, ERB11027, Hardware Test Report

Evaluation of Environmental Hardware Testing

Any critical issues found were reported, resolved and re-tested. Attachment E contains the hardware environmental reports from SLI's and EAC approved Hardware Environmental Test Subcontractor(s), EMC Integrity. These reports detail specific information on the environmental hardware testing:

SLI Hardware Test Report:

- DVS Sequoia WinEDS_2002 VSS Hardware Test Report v3.0

EMC Integrity Hardware Test Reports:

- EDGE2PLUS Model 300, ERB10906 Rev. C, Hardware Test Report
- HAAT100, ERB10904 Rev. B, Hardware Test Report
- HAAT90, ERB10905 Rev. B, Hardware Test Report
- HAAT90, ERB11027, Hardware Test Report

Hardware Testing Additional Findings:

1. **HAAT90 –** During one of the tests, voltage cycle to locking mechanism, the font size on the print reel changed. Review of HAAT90 tape showed the font size had

changed and showed some precinct sequence numbers missing. Printing continued without disruption or user interaction. At some point printer paper had to be replaced while the device was still running. Once printer paper was replaced, normal font size returned. Printing continued without disruption or user interaction

6.3 Discrepancies

During testing the following deficiencies were identified during Volume Testing:

1. An issue SEQ-31 (See Issues Report in Attachment B) was identified where a "NO" vote was cast for a proposition where there was no intentional mark placed on the ballot. The ballot image on the 400c was verified to show a 'No' vote and the corresponding ballot was identified. The ballot did not contain any visible marks in the contest where the 400c ballot image showed a vote of 'No' counted. The ballot was inspected by both SLI and the manufacturer.

   Root Cause Analysis performed by Dominion:

   There was significant evidence found that a batch of ballots were not properly fused (ink to paper), leading to mobile particles of black material in the transport of the 400C. The manufacturer was able to take photographs of black material larger than the minimum mark size. It is likely that one of the pieces of black material made its way onto a scan track of the 400C and aligned to the proposition target arrow in question, tallying it as a vote. All indications arising from: the ballot itself, the ballot image, the audit logs, SLI staff comments, and the static controls show no abnormal events in the 400C during the batch in question. Static discharge controls were inspected and found to be sound removing the static discharge as a possible issue. In addition, the SLI tester indicated that they felt no static build up in and around the batch containing the mis-read position. Dominion Voting contends that the mis-read position is the result of a black ink particle entering the scan track of the 1A referendum and being picked up as a tally.

7 Recommendations

SLI has completed the testing of the Sequoia WinEDS 4.0 voting system. Based on the findings found during testing, SLI's recommendation for Certification is dependent on the EAC's acceptance of the root cause analysis and subsequent mitigation plans provided by the vendor to address the known issues.

This recommendation reflects the opinion of SLI Global Solutions based on testing scope and results.

Traci Mapps

Sr. Director of Operations

June 8, 2012

8 Voting System Configuration

This report has been submitted to the Election Assistance Commission. Upon acceptance of this report by the EAC, a certification number will be issued.

This certification is for the system(s) described as:

Manufacturer	Hardware	Model	Revision
Sequoia	Optech 400-C	3.02	Rev. 3.02P
Sequoia	Edge2plus	300	Rev. C0.4
Sequoia	HAAT	100	Rev. A0.7
Sequoia	HAAT	90	Rev. A1.1

Appendix A – Test Plan

The final Test Plan submitted for certification is - SLI Certification Test Plan SequoiaWinEDS4.0_v1.4

End of Certification Report