Certification Test Report - Modification

Report Number: DVS-018-MCTR-01

Democracy Suite 5.5-A

Certification Test Report – Modification Version 1.1

<mark>**December 15th, 2018**</mark>

Prepared for:

Vendor Name	*Dominion Voting Systems*
Vendor System	*Democracy Suite 5.5-A*
EAC Application No.	*DVS-DemSuite5.5-A*
Vendor Address	*1201 18th Street, Suite 210 Denver, Colorado 80202*

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Revision History

Date	Release	Author	Revision Summary
December 14th, 2018	1.0	J. Panek	Initial Draft
December 15th, 2018	1.1	J. Panek	Updated to address EAC Comments

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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

<u>Any opinions or interpretations included in this report shall be marked as such, starting with "It is SLI's opinion/interpretation…"</u>

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1   Introduction, System Identification and Overview

SLI Compliance is submitting this report as a summary of the certification testing efforts for the **Dominion Voting Systems (Dominion) Democracy Suite 5.5-A (D-Suite 5.5-A)** voting system, as detailed in the section System Identification. The purpose of this document is to provide an overview of the certification testing effort and the findings of the testing effort for **Dominion D-Suite 5.5-A** voting system.

The purpose of the **Dominion D-Suite 5.5-A** voting system release is to make modifications to the **D-Suite 5.5** voting system as required by the State of Pennsylvania.

This effort included documentation review of the Technical Data Package, source code review, and testing of the **Dominion Voting Systems (Dominion) Democracy Suite 5.5-A (D-Suite 5.5-A)** voting system. Testing consisted of the development of a test plan, managing system configurations, executing test suites of functional and system levels tests based on the system's functionality, and analysis of results. The review and testing was performed at SLI's Wheat Ridge, Colorado facility.

1.1   References

1. Election Assistance Commission Voluntary Voting System Guidelines (EAC VVSG 2005), Version 1.0, 2005.
2. NIST Handbook 150: 2016.
3. NIST Handbook and 150-22: 2008.
4. EAC Voting System Testing and Certification Program Manual, United States Election Assistance Commission, v 2.0, May 2015
5. SLI VSTL Quality System Manual, Rev. 2.6, prepared by SLI, dated March 28, 2018.
6. Conduct Directive Att C - Pennsylvania Method, Pennsylvania Department of State (See Appendix A - Conduct Directive Att C - Pennsylvania Method for detailed explanation of Pennsylvania Straight Party Method)

1.2   Document Overview

This document contains the following sections:

- The Introduction discusses the application tested/reviewed
- The Certification Test Background discusses the testing process
- The Test Findings and Recommendation section contains the results and analysis of the testing effort
- Attachments which contain:
    - Attachment A - Dominion D-Suite 5.5-A Implementation Statement
    - Attachment B - Dominion D-Suite 5.5-A Documentation List

o Attachment C - Dominion D-Suite 5.5-A Discrepancy Report
o Attachment D - Dominion D-Suite 5.5-A As Run Test Plan

1.3 Terms and Abbreviations

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

Table 1 – Terms and Abbreviations

Term	Abbreviation	Description
Ballot Marking Device	BMD	An accessible computer-based voting system that produces a marked ballot (usually paper) that is the result of voter interaction with visual or audio prompts.
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
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.
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.
Functional Configuration Audit	FCA	The testing activities associated with the functional testing of the system.
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.
Physical Configuration Audit	PCA	The testing activities associated with the physical aspects of the system (hardware, documentation, builds, source code, etc.).

Term	Abbreviation	Description
Request For Information	RFI	A means used by testing laboratories and manufacturers to request that the EAC provide an interpretation of a technical issue related to testing of voting systems.
Technical Data Package	TDP	The data package supplied by the vendor, which 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 a voting system.
Voluntary Voting System Guidelines	VVSG	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 for EAC certification.
Voting System Test Lab	VSTL	An independent testing organization accredited by NVLAP and the EAC to conduct voting system testing for EAC certification.

1.4 System Identification

The **Dominion D-Suite 5.5-A** was submitted for certification testing with the hardware and software listed below. No other **Dominion** product was included in this test effort.

1.4.1 Software and Firmware

The software and firmware employed by **Dominion D-Suite 5.5-A** 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 tables below detail each application employed by the **Dominion D-Suite 5.5-A** voting system.

Table 2 – Dominion D-Suite 5.5-A Software/Firmware

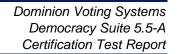| Application	Version
EMS Election Event Designer (EED)	5.5.12.1
EMS Results Tally and Reporting (RTR)	5.5.12.1
EMS Application Server	5.5.12.1
EMS File System Service (FSS)	5.5.12.1
EMS Audio Studio (AS)	5.5.12.1

Application	Version
EMS Data Center Manager (DCM)	5.5.12.1
EMS Election Data Translator (EDT)	5.5.12.1
ImageCast Voter Activation (ICVA)	5.5.12.1
EMS Adjudication	5.5.8.1
EMS Adjudication Service	5.5.8.1
Smart Card Helper Service	5.5.12.1
ImageCast Precinct	5.5.3-0002
ImageCast Central	5.5.3.0002
ImageCast X	5.5.10.30
Machine Configuration File (MCF)	5.5.10.19_20180706
Device Configuration File (DCF)	5.4.01_20170521

Table 3 – COTS Software and Firmware

Software/Firmware	Version	Filename
Microsoft Windows Server	2012 R2 Standard	Physical Media from Microsoft
Microsoft Windows	10 Professional	Physical Media from Microsoft
.NET Framework	3.5	Physical Media from Microsoft
Microsoft Visual J#	2.0	vjredist64.exe, vjredist.exe
Microsoft Visual C++ 2013 Redistributable	2013	vcredist_x64.exe vcredist_x86.exe
Microsoft Visual C++ 2015 Redistributable	2015	vc_redist.x64.exe vc_redist.x86.exe
Java Runtime Environment	7u80	jre-7u80-windows-x64.exe jre-7u80-windows-i586.exe
Java Runtime Environment	8u144	jre-8u144-windows-x64.exe jre-8u144-windows-i586.exe
Microsoft SQL Server 2016 Standard	2016 Standard	Physical Media from Microsoft
Microsoft SQL Server 2016 Service Pack 1	2016 SP1	SQLServer2016SP1-KB3182545-x64-ENU.exe
Microsoft SQL Server 2016 SP1 Express	2016 SP1	SQLEXPRADV_x64_ENU.exe
		Allison (English): Cepstral_Allison_windows_6.2.3.801.e

Software/Firmware	Version	Filename
Cepstral Voices	6.2.3.801	xe Alejandra (Spanish): Cepstral_Alejandra_windows_6.2.3.801.exe
Arial Narrow Fonts	2.37a	ARIALN.TTF ARIALNB.TTF ARIALNBI.TTF ARIALNI.TTF
Maxim iButton Driver	4.05	install_1_wire_drivers_x86_v4 05.msi install_1_wire_drivers_x64_v4 05.msi
Adobe Reader DC	AcrobatDC	AcroRdrDC1501020060_en_US.exe
Microsoft Access Database Engine	2010	AccessDatabaseEngine.exe AccessDatabaseEngine_x64.ex e
Open XML SDK 2.0 for Microsoft Office	2.0	OpenXMLSDKv2.msi
Infragistics NetAdvanatage Win Forms 2011.1	2011 Vol.1	NetAdvantage_WinForms_20111.msi
Infragistics NetAdvanatage WPF 2012.1	2012 Vol.1	NetAdvantage_WPF_20121.msi
TX Text Control Library for .NET	16.0	TXText Control.NET for Windows Forms 16.0.exe
SOX	14.3.1	sox.exe, libgomp-1.dll, pthreadgc2.dll, zlib1.dll
NLog	1.0.0.505	NLog.dll
iTextSharp	5.0.5	itextsharp.dll
OpenSSL	1.0.2k & 2.0.14 FIPS	openssl.exe, libeay32.dll, ssleay32.dll
SQLite	1.0.103.0	System.Data.SQLite.DLL (32-bit and 64-bit)
Lame	3.99.4	lame.exe
Speex	1.0.4	speexdec.exe and speexenc.exe
Ghostscript	9.04	gsdll32.dll (32-bit and 64-bit)
One Wire API for .NET	4.0.2.0	OneWireAPI.NET.dll

Software/Firmware	Version	Filename
Avalon-framework-cvs-20020806	20020806	avalon-framework-cvs-20020806.jar
Batik	0.20-5	batik.jar
Fop	0.20-5	fop.jar
Microsoft Visual J# 2.0 Redistributable Package- Second Edition(x64)	2.0	vjc.dll, vjsjbc.dll, vjslibcw.dll, vjsnativ.dll, vjssupuilib.dll, vjsvwaux.dll
Entity framework	6.1.3	EntityFramework.dll
Spreadsheetlight	3.4.3	SpreadsheetLight.dll, SpreadsheetLight.xml
Open XML SDK 2.0 For Microsoft Office	2.0.5022.0	DocumentFormat.OpenXml.dll, DocumentFormat.OpenXml.xml
OpenSSL 1.0.2k	1.0.2k	openssl-1.0.2k.tar.gz
OpenSSl FIPS 2.0.10	2.0.10	openssel-fips-2.0.10.tar.gz
Zlib	1.2.3	Zlib-1.2.3.tar.gz
Google Text-to-Speech Engine	3.11.12	ARM: com.google.android.tts_3.11.12-210311121_minAPI19(armeabi-v7a)(nodpi).apk x86: com.google.android.tts_3.11.12-210311123_minAPI15(x86)(nodpi).apk
ICX Prime Android 5.1.1 Image	0405	0405_5.1.1-01.12_user_android_x86.iso
ICX Classic Android 4.4.4 Image	0.0.98	byt_t_crv2_64-ota-BCX18-V0.0.98.zip
OpenSSL 1.0.2k	1.0.2k	openssl-1.0.2k.tar.gz
OpenSSl FIPS 2.0.10	2.0.10	openssel-fips-2.0.10.tar.gz
1-Wire Driver (x86)	4.05	install_1_wire_drivers_x86_v405.msi
1-Wire Driver (x64)	4.05	install_1_wire_drivers_x64_v405.msi
Canon DR-G1130 TWAIN Driver	1.2 SP6	G1130_DRIT_V12SP6.exe

Software/Firmware	Version	Filename
Canon DR-M160II TWAIN Driver	1.2 SP6	M160II_DRIT_V12SP6.exe
Visual C++ 2013 Redistributable (x86)	12.0.30501	vcredist_x86.exe
uClinux	20070130	uClinux-dist-20070130.tar.gz
COLILO Bootloader	20040221	Colilo20040221.tar.gz
Zxing Barcode Scanner	4.7.5	BS-4.7.5.zip
SoundTouch	1.9.2	Soundtouch-1.9.2.tar.gz

1.4.2 Equipment (Hardware)

The hardware employed by **Dominion D-Suite 5.5-A** 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 tables below detail each device employed by the **Dominion D-Suite 5.5-A** voting system.

Table 4 – Manufacturer Equipment

Device	Model
ImageCast Precinct Hybrid Optical Scanner and DRE	PCOS-320C
ImageCast Precinct Hybrid Optical Scanner and DRE	PCOS-320A
ICP Ballot Box	BOX-330A

Table 5 – COTS Equipment

Device	Model
ICX aValue 21" Tablet (SID-21V)	C10A003700689
ICX aValue 21" Tablet (HID-21V)	1708100078
Dell OptiPlex 3050 All In One	DP/N 0Y0VVT
Canon imageFormula DR-G1130 Scanner	GF306276
Canon imageFORMULA DR-M160-II	GX333152, GX333300
OKI C931e Ballot Printer	N36100A
Dell Precision T3420 PC	HLZ7HQ2, 66V9HQ2

Device	Model
HP LaserJet Pro Printer M402dn	PHB5F39374, PHB5H33434
Dell Monitor P2417H	CN0KH09GQDC0086M5F7B-A06 CN-0KH0NG-QDC00-83L-879L-A05
Dell Latitude 3480 Laptop	4Q424L2
Maxim iButton Programmer DS9490R# with DS1402	[DVS-Maxim-001] thru [DVS-Maxim-005]
APC Smart-UPS SMT1500	3S1806X01308
Dell X1026 Network Switch	E11W002
Enabling Devices Sip and Puff	[DVS-enabling devices-001] - [DVS-enabling devices-002]
Cyber Acoustics Headphones ACM-70	[DVS-cyber acoustics-001] - [DVS-cyber acoustics-002]
Enablemart # 88906 Rocker (Paddle) Switch	[DVS-paddle-001]
IOGEAR SDHC/microSDHC 0U51USC410 Card Reader	8632, 8633
Lexar USB 3.0 Dual-Slot Reader	24021564209347
ATI-USB Handset	06465020102-724 DVS-ATIUSB-001
ACS PC-Linked Smart Card Reader ACR39U	RR374-081395, RR374-046907
Dell PowerEdge R640	DP/N 0JKFH7

1.4.3 Engineering Changes

The following engineering changes occurred to software and hardware for the **Dominion D-Suite 5.5-A** voting system.

Table 6 – Engineering Changes

Component	Change ID#	Change Summary	Reason for Change
ICX	1	A modification has been made to ICX BMD straight party behavior to show a modal pop-up window when a voter attempts to undervote a partisan contest after selecting a partisan choice in the straight party contest. The pop-up clarifies that the voter needs to remove their straight-	This modification is to address an issue with state requirements identified during the examination of Democracy Suite 5.5 for Pennsylvania.

Component	Change ID#	Change Summary	Reason for Change
		party vote and manually vote all partisan contests if they wish for one or more of those contests affected by the straight party vote to be undervoted.	
ICX	2	Default ICX BMD localizations have been updated to change the final voter session wording to reflect that the ballot is being printed rather than cast.	This modification is to address an issue ==with state requirements== identified during the examination of Democracy Suite 5.5 for Pennsylvania.
ICX	3	Removed the ICX DRE configuration from this version of the system.	Devices were removed from the system configuration by Dominion.
ICX	4	Removed the ICX Classic 15" device from this version of the system.	Devices were removed from the system configuration by Dominion.
ICX	5	Utilized Machine Configuration File v5.5.10.19 instead of the version certified with D-Suite 5.5, v5.5.10.20.	The differences between the file versions ==are related to the VVPAT printer component, which is not included in== the D-Suite 5.5-A system configuration.

1.4.4 Test Materials

The following test materials are required for the performance of testing including, as applicable, test ballot layout and generation materials, test ballot sheets, and any other materials used in testing.

- Ballot grade paper
- Printer paper rolls
- USB media drives
- Compact flash cards
- Security keys
- Smart cards

1.5 System Overview
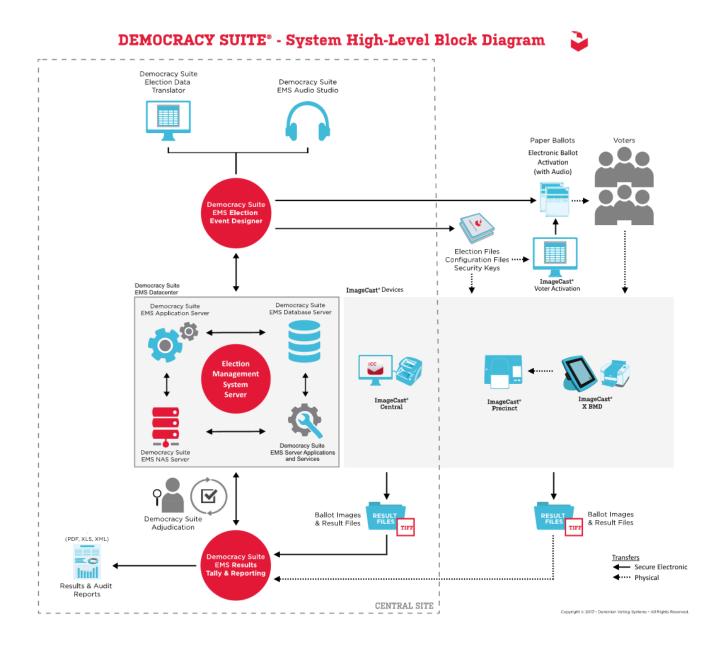
1.5.1 Block Diagram

Figure 1: D-Suite 5.5-A Voting System Overview

1.5.2   Scope of the Dominion D-Suite 5.5-A Voting System

The **Dominion D-Suite 5.5-A** voting system is a paper-based optical scan voting system consisting of the following elements: Election Management System (EMS), ImageCast Central Count (ICC), ImageCast X BMD (ICX BMD), and ImageCast Precinct (ICP). The **D-Suite 5.5-A** voting system is a modification from the baseline EAC certified **Democracy Suite 5.5 (D-Suite 5.5)** voting system, which consists of software applications and devices described below.

Election Management System (EMS)

The **Dominion D-Suite 5.5-A** EMS consists of various components running as either a front-end/client application or as a back-end/server application. A listing of the applications and a brief description of each is presented below.

- **EMS Adjudication** - Responsible for adjudication, including reporting and generation of adjudicated result files from ImageCast Central tabulators and adjudication of write-in selections from ImageCast Precinct and ImageCast Central tabulators. This client component is installed on both the server and the client machines.

- **EMS Audio Studio** - An end-user helper application used to record audio files for a given election project. As such, it is utilized during the pre-voting phase of the election cycle.

- **EMS Election Data Translator** - End-user application used to export election data from election project and import election data into election project.

- **EMS Election Event Designer** - Integrates election definition functionality together with ballot styling capabilities and represents a main pre-voting phase end-user application

- **ImageCast Voter Activation** - Allows the poll workers to program smart cards for voters. The smart cards are used to activate voting sessions on ImageCast X.

- **EMS Results Tally and Reporting** - Integrates election results acquisition, validation, tabulation, reporting, and publishing capabilities and represents the main post-voting phase end-user application.

- **EMS Adjudication Service** - Provides ballot information such as contests, candidates and their coordinates from EMS to the Adjudication application.

- **EMS Application Server** - Responsible for executing long running processes, such as rendering ballots, generating audio files and election files, etc.

- **EMS Database Server** - Database which holds all the election project data, including pre-voting and post- voting data.

- **EMS Data Center Manager** - A system level configuration application used in EMS back-end data center configuration.

- **EMS Election Device Manager** - Used for production and programming of election files, and other accompanying files, for ImageCast X terminals.
- **EMS File System Service** - A stand-alone service that runs on client machines, enabling access to low level operating system API for partitioning CF cards, reading raw partition on ICP CF card, etc.
- **EMS NAS Server** - Server file repository of the election project file based artifacts, such as ballots, audio files, reports, log files, election files, etc.
- **Smart Card Helper Service** - Provides required data format for programming smart cards for ImageCast devices, or, for jurisdiction's voting registration system in case of integration.

ImageCast Precinct (ICP)

The ICP device is a hybrid precinct optical scan paper/DRE ballot counter designed to provide six major functionalities: ballot scanning, second chance voting, accessible voting, ballot review, tabulation, and poll worker functions.

ImageCast Central (ICC) Count Scanner

The ICC is a high-speed, central ballot scan tabulator based on Commercial off the Shelf (COTS) hardware, coupled with the custom-made ballot processing application software. It is used for high speed scanning and counting of paper ballots.

ImageCast X (ICX) Ballot Marking Device (BMD)

The Democracy Suite ImageCast X ballot marking platform is used for creation of paper cast vote records. These ballots can be scanned, reviewed, cast and tabulated at the polling location on an ImageCast Precinct device or later scanned and tabulated by the ImageCast Central optical ballot scanner. The ImageCast X also supports enhanced accessibility voting through optional accessories connected to the ImageCast X unit.

2 Certification Test Background

2.1 PCA - Document and Source Code Reviews

The PCA review of the **Dominion D-Suite 5.5-A** documentation submitted in the TDP was performed to verify conformance with the EAC VVSG 1.0. Source code was reviewed for each modified software and firmware application declared within the **D-Suite 5.5-A** voting system.

All PCA reviews were conducted in accordance with Vol. 2 Section 2 of the EAC VVSG 1.0, to demonstrate that the system meets the requirements. Inconsistencies

or errors in documentation were identified to **Dominion** in a Discrepancy Report for resolution or comment. This Discrepancy Report can be found in Attachment C.

All PCA source code reviews were conducted in accordance with Vol. 1 Section 5.2 and Vol. 2 Section 5 of the EAC VVSG 1.0, to demonstrate that the system meets the requirements. A total of 376 lines of code were modified in this release. The delivered code base was compared to the previous code base from **Dominion D-Suite 5.5,** with only modified modules being reviewed.

No inconsistencies or errors were found in the modified source code.

2.2 FCA - Functional & System Testing

The FCA review of the test documentation submitted by **Dominion** in the TDP was conducted according to the EAC VVSG 1.0 Vol. 2 Section 6.7.

SLI's standard Test Suites were customized for the **Dominion D-Suite 5.5-A** voting system and conducted in accordance with the EAC VVSG 1.0 Vol. 2 Section 6 in conjunction with the functional testing. Simulations of elections were conducted to demonstrate a beginning-to-end business use case process for the **Dominion D-Suite 5.5-A** voting system.

2.2.1 Test Methods

All test methods employed are within the scope of SLI's VSTL accreditation.

The following validated test methods were employed during this test campaign:

Table 7 – Test Methods

SLI VSTL Test Method Name
TM_Basic_Election_Components v1.1
TM_Ballot Formatting and Production v1.1
TM_Maintainability v1.1
TM_Security_Access_Control v1.1
TM_Tally_and_Reporting v1.1
TM_Voting_Capabilities v1.3
TM_Voting_Straight_Party

The above listed test methods are implemented in a complementary fashion: modules are employed from various methods to form suites. Suites include a logical sequence of functionality that is used to validate the requirement addressed by each module within the suite.

2.2.2 Acceptance of Prior Testing

SLI evaluated the published Final Test Report for the **Dominion D-Suite 5.5** voting system in order to baseline the current system under test.

State testing performed for the State of Pennsylvania found issues with state requirements on how straight party voting was handled, and with localization verbiage contained in the final stage of a voter session that indicated the word "cast" rather than "print". During the security penetration test performed pursuant to the State of Pennsylvania "Attachment E to the Directive for Electronic Voting Systems", discrepancies were identified in the system that made it non-compliant with those requirements. Dominion made modifications to the documentation of D-Suite 5.5-A to bring the system into compliance with the State of Pennsylvania's requirements.

These issues were corrected in this release under review and were verified.

No prior state or non-VSTL testing was considered for this test campaign.

2.3 Testing Performed

2.3.1 Configurations Tested

The **Dominion D-Suite 5.5-A** voting system, as declared in the application for certification submitted to the EAC, consists of:

- An EMS workstation with minimum requirements of the following:

   EMS Express Server Hardware Configuration:

   o Workstation class computer
   o Dual quad core CPU (Intel i5 series)
   o 16 GB RAM minimum
   o Dual 500 GB in RAID 1 mode (mirror)
   o DVD reader
   o Smart UPS
   o USB Compact Flash card reader
   o USB iButton Security Key reader

   EMS Express Client Hardware Configuration:

   o Workstation class computer
   o Single or Dual quad core CPU (Intel i5 series)
   o 8 GB RAM minimum
   o 500 GB HDD minimum
   o DVD reader
   o USB Compact Flash card reader
   o USB iButton Security Key reader

EMS Standard Server Hardware Configuration:

- o Server class computer
- o Dual quad core CPU (Intel Xeon E5 series)
- o 32 GB RAM minimum
- o Dual 1TB in RAID 1 mode, and 4x 1TB in RAID 10 mode
- o Dual power supply
- o DVD reader
- o Smart UPS

EMS Standard Client Hardware Configuration:

- o Workstation class computer
- o Single or Dual quad core CPU (Intel i5 series)
- o 8 GB RAM minimum
- o 500 GB HDD minimum
- o DVD reader
- o USB Compact Flash card reader
- o USB iButton Security Key reader

- At the precinct level, optical scanners (ICP) and ballot marking devices (ICX) are employed.
- The central count location employs a COTS scanner (ICC) for tabulation of ballots.

2.3.2 Testing Performed

System level test suites included the following:

- o **General Election, Pennsylvania Straight Party Method**

  A General Election was executed to test all variations of the Pennsylvania Straight Party Method, to ensure all modifications and Straight Party functionality are working correctly as documented, and in accordance with the VVSG 1.0 requirements. This General election included N of M voting, partisan offices, non-partisan offices, Pennsylvania straight party method, ballot formatting, precincts and districts, precinct level voting, as well as tally and reporting functionality. These tests incorporated the ICX, ICP, and ICC devices.

- o **Closed Primary Election**

  A Closed Primary Election was executed that included N of M voting, partisan offices, non-partisan offices, straight party voting, ballot formatting, precincts and districts, precinct level voting, as well as tally and reporting functionality. These tests incorporated the ICX, ICP, and ICC devices.

3 Test Findings and Recommendation

3.1 Summary of Findings

3.1.1 Source Code Review Summary

SLI conducted a source code review for all modified software, applications, and configuration files in the **Dominion D-Suite 5.5-A** voting system. It has been determined the code is compliant with the EAC VVSG 1.0, Vol. 1 Sections 5, 9 and Vol. 2 Section 5.4 and for compliance with the coding standards used by **Dominion**.

No deficiencies were found during source code review.

3.1.1.1 Evaluation of Source Code

The source code was reviewed for compliance per the guidelines defined in the VVSG. The source code was written satisfactorily in terms of the EAC VVSG 1.0. The code is modular and there is sufficient error handling. Readability is sufficient and supports maintainability.

3.1.2 Technical Data Package Review Summary

SLI has reviewed the **Dominion D-Suite 5.5-A** TDP for compliance with the EAC VVSG 1.0 Vol. 2 Section 2.

Due to findings identified while performing state testing of D-Suite 5.5 for the State of Pennsylvania pursuant to "Attachment E to the Directive for Electronic Voting Systems", it was determined that the system hardening procedures needed to be updated to comply with state requirements.

The specific documents and their associated version numbers are listed in Attachment B.

3.1.2.1 Evaluation of TDP

The Technical Data Package for the **Dominion D-Suite 5.5-A** voting system was found to sufficiently comply with the standards such that a jurisdiction would be able appropriately deploy the **Dominion D-Suite 5.5-A** voting system.

System hardening procedures were thoroughly reviewed by a Security Test Specialist to ensure the process is accurate and fully documented. Changes made to the documents in the previous version of the system TDP have sufficiently addressed all outstanding concerns regarding the findings identified during the state testing for the State of Pennsylvania pursuant to "Attachment E to the Directive for Electronic Voting Systems" on **D-Suite 5.5**.

Attachment C details specific information on the TDP review. This information was submitted to **Dominion** for their review during the course of the project.

3.1.3 Functional Testing Summary

SLI performed tests on each of the system configurations identified in Section 2.3.1. The testing incorporated end-to-end election scenarios testing the functionality supported by **Dominion**, as identified in Attachment A.

3.1.3.1 Evaluation of Testing

The following test suites were executed:

- General Election, Pennsylvania Straight Party Method
- Closed Primary Election

The above tests were successfully conducted using the executables delivered in the final Trusted Build, in association with the appropriate hardware versions as declared in this Test Report for the **Dominion D-Suite 5.5-A** voting system.

3.2 Recommendation

SLI has successfully completed the testing of the **Dominion D-Suite 5.5-A** voting system. It has been determined that the **D-Suite 5.5-A** voting system meets the required acceptance criteria of the Election Assistance Commission's Voluntary Voting System Guidelines 1.0.

This recommendation reflects the opinion of SLI Compliance based on testing scope and results. It is SLI's recommendation based on this testing effort that the EAC grant certification of **Dominion D-Suite 5.5-A** voting system.

4 Approval Signature

Traci Mapps
VSTL Director
December 15th, 2018

End of Certification Report