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Test Plan for EAC 2005 VVSG Certification Testing Clear Ballot Group ClearVote 1.4 Voting System

EAC Project Number: CBG1601

Version: As-Run

Date: 11/17/17

U.S. Election Assistance Commission

VSTL

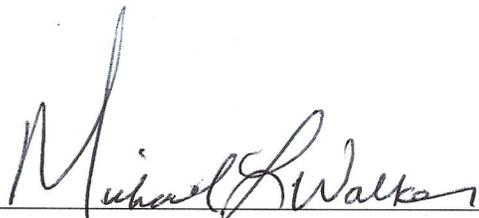
EAC Lab Code 1501

The NVLAP logo features the letters 'NVLAP' in a stylized, outlined font. The letter 'P' is uniquely designed with a vertical stem that curves into a hook-like shape at the bottom. A registered trademark symbol (®) is located to the upper right of the 'P'.

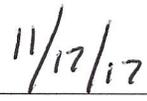
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SIGNATURES

Approved by:

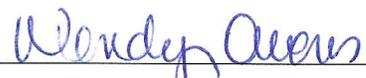


Michael Walker, VSTL Project Manager



Date

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REVISIONS

Revision	Description	Date
NR	Initial Release	11/29/16
A	Test Plan updated based on EAC comments	01/05/17
B	Highlights removed	01/18/17
C	Updates to the Voting System Software and Hardware tables. Updates to the TDP tables. Updates to the Project Schedule	06/05/17
D	Updated based on additional EAC review & comments	07/07/17
E	Highlights Removed and grammatical errors fixed in section 3.1 and table 3-2	07/13/17
As-Run	Final version based on test performance and updated TDP	11/17/17

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	References.....	1
1.2	Terms and Abbreviations.....	1
1.3	Testing Responsibilities.....	2
1.3.1	Project Schedule.....	2
1.3.1.1	Owner Assignments.....	2
1.3.1.2	Test Case Development.....	2
1.3.1.3	Test Procedure Development and Validation.....	2
1.3.1.4	Third Party Tests.....	3
1.3.1.5	EAC and Manufacturer Dependencies.....	3
1.4	Target of Evaluation Description.....	3
1.4.1	System Overview.....	3
1.4.2	Block Diagram.....	6
1.4.3	System Limits.....	7
1.4.4	Supported Languages.....	8
1.4.5	Supported Functionality.....	8
1.4.5.1	Standard VVSG Functionality.....	8
1.4.5.2	Manufacturer Extensions.....	8
2.0	PRE-CERTIFICATION TESTING AND ISSUES	9
2.1	Evaluation of Prior VSTL Testing.....	9
2.2	Evaluation of Prior Non-VSTL Testing.....	9
2.3	Known Field Issues.....	9
3.0	MATERIALS REQUIRED FOR TESTING	9
3.1	Software.....	10
3.2	Equipment.....	12
3.3	Test Materials.....	13
3.4	Deliverable Materials.....	14

4.0	TEST SPECIFICATIONS	15
4.1	Requirements (Strategy of Evaluation).....	15
4.1.1	Mapping of Requirements to Equipment Type and Features.....	16
4.1.2	Rational for ‘Not Applicable’ requirements	16
4.2	Hardware Configuration and Design	17
4.3	Software System Functions.....	18
4.4	Test Case Design	18
4.4.1	Hardware Qualitative Design.....	19
4.4.1.1	Mapping of Requirements to Specific Interfaces.....	19
4.4.2	Hardware Environmental Test Case Design	20
4.4.3	Software Module Test Case Design and Data	20
4.4.4	Software Functional Test Case Design and Data.....	20
4.4.5	System-Level Test Case Design	21
4.5	Security Functions	21
4.6	TDP Evaluation.....	21
4.7	Source Code Review.....	24
4.8	QA & CM System Review	24
5.0	TEST DATA	24
5.1	Test Data Recording	24
5.2	Test Data Criteria.....	25
5.3	Test Data Reduction.....	25
6.0	TEST PROCEDURES AND CONDITIONS	25
6.1	Facility Requirements	25
6.2	Test Set-Up	25
6.3	Test Sequence	26
7.0	TEST OPERATIONS PROCEDURES	26
7.1	Proprietary Data.....	26
	PROJECT SCHEDULE	A-1

1.0 INTRODUCTION

The purpose of this Test Plan is to document the procedures that Pro V&V, Inc. will follow to perform full certification testing during a new system campaign for the Clear Ballot Group (CBG) ClearVote 1.4 Voting System to the requirements set forth for voting systems in the U.S. Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (VVSG), Version 1.0. Prior to submitting the voting system for testing, CBG submitted an application package to the EAC for certification of the ClearVote 1.4 Voting System. The application was accepted by the EAC and the project was assigned the unique Project Number of CBG1601.

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

1.1 References

- Election Assistance Commission 2005 Voluntary Voting System Guidelines (VVSG) Version 1.0, Volume I, “Voting System Performance Guidelines”, and Volume II, “National Certification Testing Guidelines”
- Election Assistance Commission Testing and Certification Program Manual, Version 2.0
- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 2.0
- 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
- Pro V&V, Inc. Quality Assurance Manual, Revision 7.0
- Election Assistance Commission “Approval of Voting System Testing Application Package” letter dated May 04, 2016
- EAC Requests for Interpretation (RFI) (listed on www.eac.gov)
- EAC Notices of Clarification (NOC) (listed on www.eac.gov)
- Clear Ballot Group’s Technical Data Package (*A listing of the ClearVote 1.4 documents submitted for this test campaign is listed in Section 4.6 of this Test Plan*)

1.2 Terms and Abbreviations

This subsection lists terms and abbreviations relevant to the hardware, the software, or this Test Plan.

“ADA” – Americans with Disabilities Act 1990

“BMD” – Ballot Marking Device

“CBG” – Clear Ballot Group

“CM” – Configuration Management

“COTS” – Commercial Off-The-Shelf
“DRE” – Direct Record Electronic
“EAC” – United States Election Assistance Commission
“EMS” – Election Management System
“FCA” – Functional Configuration Audit
“HAVA” – Help America Vote Act
“ISO” – International Organization for Standardization
“NOC” – Notice of Clarification
“PC” – Personal Computer
“PCA” – Physical Configuration Audit
“QA” – Quality Assurance
“RAM” – Random Access Memory
“RFI” – Request for Interpretation
“TDP” – Technical Data Package
“UPS” – Uninterruptible Power Supply
“VSTL” – Voting System Test Laboratory
“VVSG” – Voluntary Voting System Guidelines

1.3 Testing Responsibilities

All testing will be conducted under the guidance of personnel verified by Pro V&V, Inc. to be qualified to perform the testing.

1.3.1 Project Schedule

The Project Schedule for the test campaign is located in Appendix A – Project Schedule. The dates on the schedule are not firm dates but planned estimates based on the anticipated project work flow.

1.3.1.1 Owner Assignments

This information is contained in the Project Schedule presented in Appendix A.

1.3.1.2 Test Case Development

Pro V&V will utilize baseline test cases for the Functional Configuration Audit (FCA), Usability, and System Integration Tests. These test cases will be augmented with specially designed test cases tailored to the specific design of the ClearVote 1.4 System. Additionally, specific election definitions will be designed for the Operational Status Check and the Logic & Accuracy Tests.

1.3.1.3 Test Procedure Development and Validation

Pro V&V will utilize VSTL Test Procedures during the duration of the test campaign. These procedures are developed to the EAC 2005 VVSG standards. The validation of the VSTL Test Procedures is accomplished by Technical Review and Approval. If necessary and where practical, a validation might include execution to attempt to achieve the expected results using the selected tool of the testing methodology. Test Plans, Test Suites, Test Specifications, and Test Cases will be validated prior to execution. This validation will include the following:

- Confirmation of adequate test coverage of all requirements.
- Confirmation that test case results are not ambiguous and have objective pass/fail criteria.
- Confirmation that any automated test suites will produce valid results.

1.3.1.4 Third Party Tests

Pro V&V will be utilizing NTS Longmont during the performance of hardware testing. All testing will be witnessed by Pro V&V personnel at NTS Longmont with the exception of Temperature Power Variation in which Pro V&V qualified staff will execute all testing at NTS Longmont. Product Safety testing will be performed by TÜV SÜD Canada.

1.3.1.5 EAC and Manufacturer Dependencies

This information is contained in the Project Schedule presented in Appendix A.

1.4 Target of Evaluation Description

The following sections contain a product description and an overview of the design methodology of the ClearVote 1.4 Voting System, as taken from the Clear Ballot Group technical documentation.

1.4.1 System Overview

The ClearVote 1.4 Voting System is a paper-based optical scan voting system consisting of the following major components: ClearDesign (ballot design and EMS), ClearCount (central count, tabulation, and reporting), ClearCast (precinct count and tabulation), and ClearAccess (accessible voting and ballot marking device).

ClearDesign

ClearDesign is an Election Management System consisting of an interactive set of applications which are responsible for all pre-voting activities necessary for defining and managing elections. This includes ballot design, ballot proofing, ballot layout, and ballot production. The ClearDesign system consists of the physical components listed below. All of the components are unmodified COTS that are connected via a wired, closed, and isolated network not connected to any other systems or the internet.

- DesignServer: A laptop or desktop computer running the ClearDesign software and hosting its election database and the web server that serves its election reports.

- DesignStation(s): One or more laptop or desktop used to connect to the DesignServer. A browser is used to perform the necessary tasks. A user with administration privileges will be able to define users and manage the elections.
- Router: Used to connect the DesignStations to the DesignServer using a wired, closed Ethernet.

ClearCount

ClearCount is a central, high-speed, optical scan ballot tabulator coupled with ballot processing applications. The ClearCount software runs on unmodified COTS laptop or desktop computers running the Windows operating system and supports specific models of Fujitsu scanners. The ClearCount central-count system consists of the physical components listed below. All of the components are unmodified COTS that are connected via a wired, closed, and isolated network not connected to any other systems or the internet.

- ScanServer: A laptop or desktop computer running the ClearCount software and hosting its election database and the web server that serves its election reports.
- ScanStation(s): One or more laptop or desktop/scanner pairs used to scan and tabulate ballots.
- Router: Used to connect the ScanStations to the ScanServer using a wired, closed Ethernet.
- Election Administration Station and/or Adjudication Station: One or more Windows laptop or desktop computers installed with browser software, linked by a wired Ethernet connection to the ScanServer using the router. This station can serve multiple uses: user administration, election administration, adjudication, and reporting. This station is also used to consolidate the vote totals from the ClearCast precinct tabulator.

All files that make up the ClearCount software reside on a single ScanServer that is shared by all client ScanStations. The Tabulator software is executed by the ScanStations at run-time from files that reside on the ScanServer. The only software programs that have to be installed on ScanStations, apart from the Windows operating system, are the Fujitsu ScandAll Pro software and drivers required by the scanner hardware.

The ClearCount software consists of the following components:

- Tabulator: The Tabulator application handles ballot tabulation. The Tabulator software is stored on the ScanServer and an instance of Tabulator runs on each ScanStation. The Tabulator program analyzes the incoming image and transfers them to the local output folder named CBGBallotImages. The ScanServer retrieves the images from the folder and uploads them into the Election database.
- Election Database: A centralized election database that resides on the ScanServer and collects the output of each Tabulator.
- Election Reports: A browser-based suite of reports that provides election results and analysis and allows election officials to review individual ballot images. A web server on the ScanServer serves the reports.
- Card Resolutions tool: A web application that allows election officials to review and appropriately resolve unreadable voted ballots.

- User and Election Database Management through web applications: On the User Administration dashboard, the administrator can add, rename, or delete users, assign permissions, and change user passwords. On the Election Administration dashboard, the administrator can create or delete an election, set an election as active, and backup or restore an election.

ClearCast

The ClearCast tabulator is a precinct count ballot scanning solution suitable for early and election in-person voting, including processing ballots printed by the ClearAccess accessible ballot marking device. The ClearCast application runs on the P1000 precinct count-based tabulator, and is used to scan, count and tally marked ballots. Its functionality is divided into three essential modes, Election Mode (Early Voting and/or Election Day), which is used to process ballots in live election mode, Pre-Election Mode, which occurs prior to Election Mode, and is used to test all system functionality prior to election begin, and Post-Election Mode, which is used to perform administrative functions following election close.

ClearAccess

ClearAccess is an accessible touchscreen ballot marking device (BMD) used for the creation of paper ballots that can be scanned and tabulated by Clear Cast or ClearCount.

1.4.2 Block Diagram

The system overview of the submitted voting system is depicted in Figure 1-1.

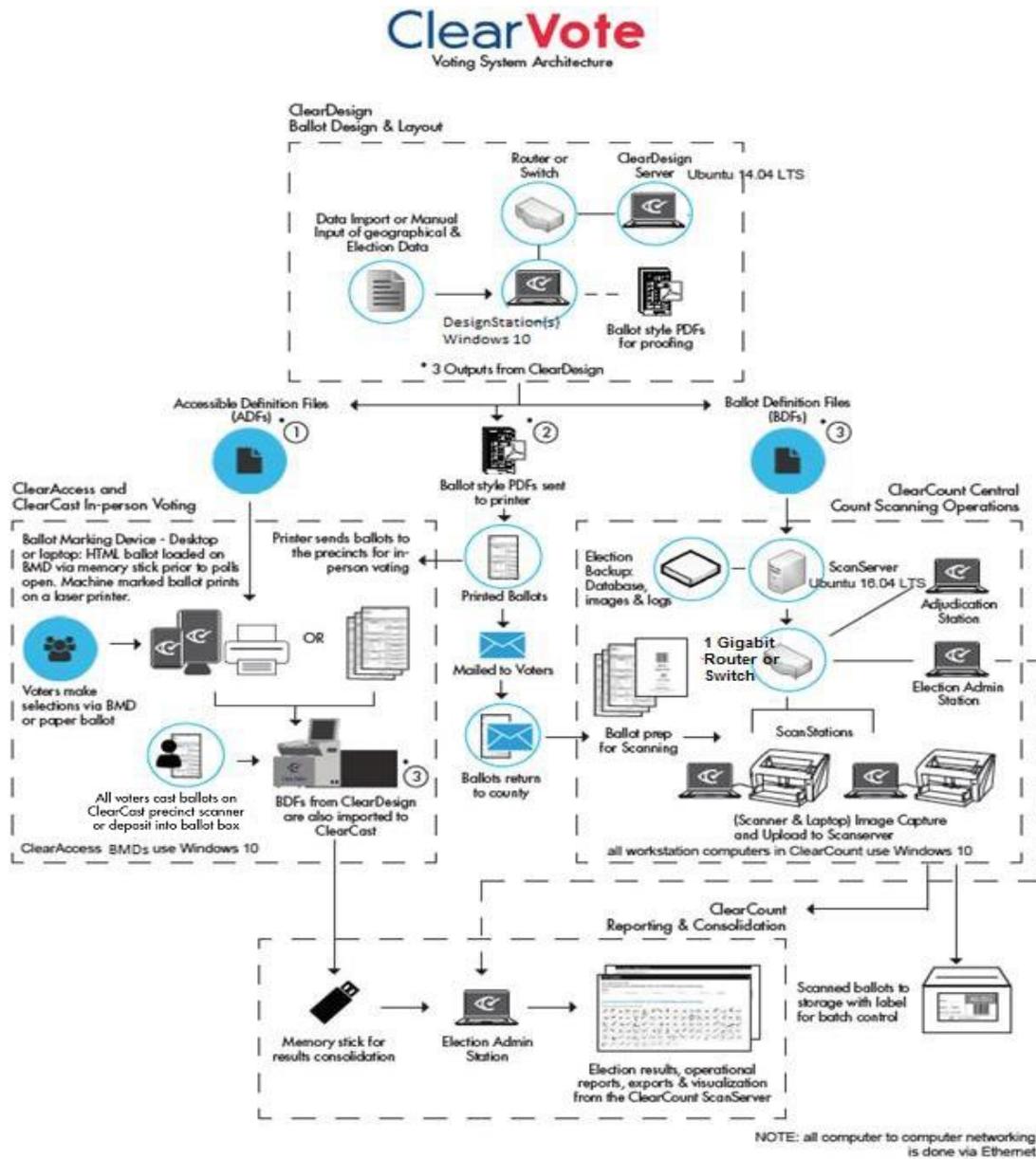


Figure 1-1. ClearVote 1.4 System Overview

1.4.3 System Limits

The system limits that CBG has stated to be supported by the ClearVote 1.4 Voting System are listed in the tables below.

Table 1-1. System Limits for ClearDesign

Characteristic	Limit
Precincts in an election	3200
Contests in an election	3200
Candidates/Counters in an election	3200
Ballot Styles in an election	3200
Contests in a ballot style	60
Candidates in a contest	300
Ballot styles in a precinct	50
Number of political parties	50
“vote for” in a contest	50
Supported languages in an election	15
Number of write-ins	50

The maximum ballot positions for the ClearVote 1.4 Voting System are as follows:

Table 1-2. Maximum Oval Positions for ClearDesign

Ballot Size	Oval positions per side
5 inch	60
11 inch	180
14 inch	240
17 inch	300
19 inch	360
22 inch	420

Table 1-3. System Limits for ClearCount

Scanner Model	Sustained (not burst speed) ballots per hour						Typical county size (central count)
	8.5x5	8.5x11	8.5x14	8.5x17	8.5x19	8.5x22	
fi-6400	5592	3624	2928	2448	2350	2236	Large (>100k voters)
fi-6800	7822	5508	4155	3352	3000	2800	Large (>100k voters)
fi-7180	3396	2040	1692	1400	1300	1200	Small (<25k voters)
ClearCount can have a maximum of 10 ScanStation/Scanner pairs							

1.4.4 Supported Languages

The submitted voting system supports:

- English
- Spanish
- Chinese
- Korean
- Vietnamese
- Danish
- Dutch
- Flemish
- French
- German
- Italian
- Japanese
- Norwegian
- Portuguese
- Swedish

Support for all stated languages will be verified; however, only English and Spanish language ballots will be cast during the performance of functional testing. Additionally, one character based language (Chinese) will be tested during System Integration Testing.

1.4.5 Supported Functionality

The ClearVote 1.4 is designed to support the following voting variations:

- General Election
- Closed Primary
- Open Primary
- Early Voting
- Partisan/Non-Partisan Offices
- Write-In Voting
- Primary Presidential Delegation Nominations
- Straight Party Voting
- Split Precincts
- Vote for N of M
- Ballot Rotation
- Provisional or Challenged Ballots

1.4.5.1 Standard VVSG Functionality

The ClearVote 1.4 Voting System shall be evaluated against the relevant requirements contained in the EAC 2005 VVSG, Volumes I and II.

1.4.5.2 Manufacturer Extensions

There are no manufacturer extensions on testing for this test campaign.

2.0 PRE-CERTIFICATION TESTING AND ISSUES

The following pre-certification testing has been performed on an “At-Risk” basis:

Technical Date Package (TDP) Review

An initial TDP review was performed on the documents submitted for this test campaign. The initial review is an abbreviated review performed in order to determine if the documents contain sufficient information. It was determined that various documents were lacking some information. Additionally, inconsistencies were noted throughout the TDP package. The results of the review were reported to Clear Ballot Group for resolution. Clear Ballot Group has subsequently revised and resubmitted the TDP and Pro V&V is currently reviewing these submissions. Specific documents have been reviewed multiple times in order to facilitate performance of the FCA. The findings of each review performed are tracked in the TDP review spreadsheet.

Physical Configuration Audit (PCA)

An initial PCA has been performed to baseline the system prior to test campaign commencement. The PCA was performed by documenting each hardware and software component of the voting system by name, model, serial number, major component, and any other relevant information needed for identification. Photographs of each hardware component were also taken.

2.1 Evaluation of Prior VSTL Testing

The ClearVote 1.4 is a new voting system that has not previously been tested to applicable federal standards in the EAC Program.

2.2 Evaluation of Prior Non-VSTL Testing

The ClearVote 1.4 is a new voting system that has not previously been tested to applicable federal standards in the EAC Program. However, Pro V&V will review the results of any Summative Usability Testing performed on the system to verify that the submitted test results are in Common Industry Format.

2.3 Known Field Issues

The ClearVote 1.4 is a new voting system that has not been fielded for use.

3.0 MATERIALS REQUIRED FOR TESTING

The following sections list all materials needed to enable the test engagement to occur.

The materials required for testing of the ClearVote 1.4 Voting System include all materials to enable the test campaign to occur. This includes the applicable hardware and software as well as the TDP, test support materials, and deliverable materials, as described in the following subsections.

3.1 Software

This subsection lists the proprietary and COTS software to be provided by the manufacturer as part of the test campaign. The individual components are compiled to create the ClearVote 1.4 Voting System (ClearCast 1.4, ClearCount 1.4, ClearDesign 1.4, and ClearAccess 1.4).

Table 3-1. Voting System Software

Firmware/Software	Version
<i>ClearDesign Components, Version 1.4.3</i>	
Windows	10 Pro 1607
Google Chrome	55.0.2883.87
Ubuntu	14.04.4 LTS
MySQL	5.5.55
Apache	2.4.7
libapache2-mod-fcgid	2.3.9
PhantomJS	1.9.0
Usbmount	0.0.22
Unzip	6.0.9
Samba	4.3.11
Python PIP	1.5.4
Zip	3.0.8

Pyinstaller	3.0
Python JSMIN	2.2.1
Python	2.7.6
Python webpy	0.38
Python MySQL DB	1.2.3
SQLAlchemy	1.0.15
Python Pillow	2.3.0
Python Flup	1.0.2
Python DBUtils	1.1
Python XLRD	0.9.4
Python FontTools library	3.0
Python RTF	0.2.1
OpenSSL (FIPS)	2.0.5
OpenSSL	1.0.1f
DataTable	1.10.5
DataTable-TableTools	2.2.3
DataTable-ColVis	1.1.1
DataTable-ColReorder	1.1.2
DataTablePlugins	1.10.10
bootstrap	3.0.0
jquery	1.10.2
jquery-impromptu	5.2.3
jquery-qrcode	1.0
jquery-splitter	0.14.0
jquery-ui	1.10.4
jscolor	1.4.2
tinymce	4.1.9
fastclick	1.0.4
libmp3lame	0.5.0
jszip	3.1.2
papaparse	4.1.2
jsmin	12/4/2003
<i>ClearAccess Components, Version 1.4.1</i>	
Windows	10 Pro 1607
Google Chrome	61.0.3163.100
nsis	3.01
PyInstaller	3.2
Python	2.7.10
webpy	0.38

Python-future	0.15.2
pefile	2016.3.28
pywin	220
jquery	1.10.5
DataTables	1.10.5
ColVis	1.1.1
ColReorder	1.1.2
jsmin	2003-12-04
Brother printer driver	1.0.1.0
Okidata printer driver	1.0.0.0
<i>ClearCast Components, Version 1.4.2</i>	
scanner_control	0.0.25
UPSBatteryMontior	1.0
Ubuntu	14.04.5 LTS
google_chrome	59.0.3071.104
zeromq	4.2.0
arduino tools	1.8.0
adafruit tools	1.4.9
pyinstaller	3.2.1
openssl-fips	2.0.10
openssl	1.0.1f
libPDIScan.so	7.1.0
pdi_ps3_drv_scanner.ko	2.0.5
DataTables	1.10.5
JTSage DateBox	4.0.0
jQuery.NumPad	1.4
jQuery	1.10.2
jquery.ui	1.11.3
<i>ClearCount Components, Version 1.4.2</i>	
Windows	10 Pro 1607
Google Chrome	55.0.2883.87
Ubuntu	16.04.1 LTS
Python(part of Ubuntu)	2.7.12
Pillow (part of Ubuntu)	3.1.2
MySQLdb (part of Ubuntu)	1.3.7
PyInstaller	3.2.1
PollyReports	1.7.6
OpenSSL	1.0.2g
OpenSSL FIPS Object Module	2.0.10
JavaScript Bootstrap library	2.3.2

JavaScript Chosen library	1.0.0
JavaScript jQuery library	1.10.2
J JavaScript jQuery-migrate library	1.2.1
JavaScript DataTables library	1.9.4
ColVis	1.0.8
JavaScript TableTools library	2.1.5
ZeroClipboard	1.0.4-TableTools2
JavaScript FixedHeader library	2.0.6
JavaScript hotkeys library	1.0
JavaScript tooltip library	1.3
JavaScript pep library	1.0
JavaScript LESS library	1.3.3
Fujitsu fi-6400	PaperStream 1.30.0
Fujitsu fi-6800	10.10.710
Fujitsu fi-7180	PaperStream 1.4.0

3.2 Equipment

This subsection lists the proprietary and COTS equipment provided by the manufacturer as part of the test campaign.

For COTS equipment, every effort will be made to verify that the COTS equipment has not been modified for use. This will be accomplished by performing research using the COTS equipment manufacturer's websites based on the serial numbers and service tag numbers for each piece of equipment. Assigned test personnel will evaluate COTS hardware, system software and communications components for proven performance in commercial applications other than voting. For PCs, laptops, and servers, the service tag information will be compared to the system information found on each machine. Physical external and internal examination will also be performed when the equipment is easily accessible without the possibility of damage. Hard drives, RAM memory, and other components will be examined to verify that the components match the information found on the COTS equipment manufacturer's websites.

Table 3-2. Voting System Equipment

Component	Model	Serial Number
<i>ClearDesign Components</i>		
Dell Latitude Laptop	5580	7L6M3G2
Dell PowerEdge Server	T630	2K5YFK2, JLPYHK2, & JLPXWK2
Dell 24 inch Monitor	SE2416H	FVWV5G2
Dell 22 inch Monitor	E2216HV	36765D2 & 90665D2
Dell Mini Tower	T3620	IHCLXK2 & IHCKXK2
TP-LINK VPN Router	TL-R600VPN	2149342000209, 2166306000413, & 2168351001114

Lenovo USB Portable DVD Burner	LN-8A6NH11B	8SSDX0H33226L1CB7107099
ClearAccess Components		
Dell OptiPlex AIO	5250	6PW4GK2, BPYXCH2, HGCMGK2, & 6PWZFK2
Dell 15" Inspiron	7000 series	80S1YD2, 7TT1YD2, & 22S1YD2
Brother Laser Printer	HL-L2340DW	U63879M4N62861, U63879M4N628617, U63879A7N416353, & U63879M4N628535
Oki Data Laser Printer	B432dn	AK5B007647A0, AK76030925A0, AK76030928A0, AK62030437A0, AK62030440A0, & AK76030928A0
Storm EZ Access Keypad	EZ08-222013	15000005, 15000007, & 15020478
Origin Instruments Sip/Puff Breeze with Headset	AC-0313-H2	CBG-SP-001, CBG-SP-002, & CBG-SP-003
Hamilton Buhl Over-Ear Stereo Headphones	HA7	CBG-HP-001 & CBG-HP-002
ElectionSource Table Top Voting Booth (Privacy Screen)	VB-60B	CBG-VB-001
APC Smart-UPS	SMT2200	AS1602232215, AS1721142050, AS1638230963, AS1721132721, & AS1625141816
Ergotron Stand for Dell OptiPlex 5250 AIO (portrait mode)	Neo Flex	1274839-0061 & 1358124-0005
ClearCount Components		
Dell Latitude Laptop (multiple units)	5580	2F3L3G2, C9S22G2, CF3L3G2, 90356H2, BDH46H2, 8TM46H2, 4PM46H2, 4QM46H2, 3CH46H2, & FPM46H2
Dell PowerEdge Server	T330	5RRFGK2, 5712JK2, & FHV9RD2
Dell OptiPlex AIO	7440	JXDFHH2, JXDFDH2, & 64WPXG2
Dell Precision Workstation	T3620	GW6XHH2 & H0PZFK2
Fujitsu Scanner	fi-7180	A20DC10302, A20DC10378, A20D000798, & A20DC08933
Fujitsu Scanner	fi-6800	A9HCC00543, A9HCC00535, & 100295
Fujitsu Scanner	fi-6400	AKHCC00609, AKHCC00337, & AKHCC00362
Lenovo USB Portable DVD Burner	LN-8A6NH11B	8SSDX0H33226L1CB7107099
Dell 22 inch Monitor	E2216HV	GD965D2
Dell 22 inch Monitor	P2217	7818672

Dell 22 inch Monitor	S2240M	CN-0CFGKT-64180-58B-0X3T
Dell 27 inch Monitor	P2717H	CDMS672 & HPWD072
Cisco Catalyst Switch (1 Gigabit Router or Switch)	2960-X Series	FCW2039B6QF & FCW2110A1E0
TP-LINK Easy Smart Switch (1 Gigabit Router or Switch)	TL-SG108E	216C319009010 & 216C319009012
NetGear ProSafe VPN Firewall (1 Gigabit Router or Switch)	FVS318G	40F266BA00280
APC Smart-UPS	SMT1500	3S1525X07491, 3S1525X07421, & 4B1448P39979
Western Digital External Hard Drive	WDBBGB0040HBK	WCC7K5CHA3DK
EZ Scanning Shelf (fi-6400 or fi-6800)	Model: WorkeZ	CBG-EZ-001, CBG-EZ-002, CBG-EZ- 003, & CBG-EZ-004
ClearCast Components		
ClearCast	Model: 1 Version A	Cast0011, Cast0014, Cast0015, Cast0017, Cast0018, and Cast0020

3.3 Test Materials

This subsection lists the test materials required to execute the required tests throughout the test campaign.

The following materials are expected to be supplied by Clear Ballot to facilitate testing:

- USB Flash Drives, 8 and 32 GB capacity
- Test Decks
- Power Cords
- Ballot Paper, 4 in. thermal paper, 24 lb. bond or similar paper for results reports
- Labels
- Other materials and equipment as required

3.4 Deliverable Materials

This subsection lists the materials identified by the manufacturer as materials deliverable to the end user for the system being tested.

Table 3-3. Voting System Deliverables

Material	Version	Description
ClearDesign	1.4.3	EMS Software
ClearAccess	1.4.1	BMD software
ClearCount	1.4.2	Central Count and Tabulation Software
ClearCast	1.4.2	Precinct Count Software

ClearAccess 1.4 Acceptance Test Checklist	1.0.1	TDP Document
ClearAccess 1.4 Build Procedures	1.0.4	TDP Document
ClearAccess 1.4 Functionality Description	1.5	TDP Document
ClearAccess 1.4 Hardware Specification	1.4	TDP Document
ClearAccess 1.4 Installation Guide	1.4	TDP Document
ClearAccess 1.4 Maintenance Guide	1.5	TDP Document
ClearAccess 1.4 Poll Worker Guide	1.6.2	TDP Document
ClearAccess 1.4 Security Specification	1.4.2	TDP Document
ClearAccess 1.4 Software Design and Specification	1.4.1	TDP Document
ClearAccess 1.4 Supervisor Guide	1.7.3	TDP Document
ClearAccess 1.4 System Identification Guide	1.0.1	TDP Document
ClearAccess 1.4 System Overview	1.5.1	TDP Document
ClearAccess 1.4 Voter Guide	1.1	TDP Document
ClearAccess Poll Worker Instructions Multi Day Voting (poster)	10010	TDP Document
ClearAccess Poll Worker Instructions (poster)	10010	TDP Document
ClearAccess Simplified Voter Instructions (poster)	10010	TDP Document
ClearCast 1.4 Acceptance Test Checklist	1.1.1	TDP Document
ClearCast 1.4 Approved Parts List	1.1	TDP Document
ClearCast 1.4 Build Procedures	1.0.1	TDP Document
ClearCast 1.4 Functionality Description	1.4	TDP Document
ClearCast 1.4 Hardware Specification	1.3	TDP Document
ClearCast 1.4 Installation Guide	1.1.1	TDP Document
ClearCast 1.4 Maintenance Guide	1.5.1	TDP Document
ClearCast 1.4 Poll Worker Guide	1.5.1	TDP Document
ClearCast 1.4 Security Specification	1.3	TDP Document
ClearCast 1.4 Software Design and Specification	1.3.1	TDP Document
ClearCast 1.4 Supervisor Guide	1.6.1	TDP Document
ClearCast 1.4 System Identification Guide	1.0.1	TDP Document
ClearCast 1.4 System Overview	1.3.2	TDP Document
ClearCast Tabulator Quick Start Guide (poster)	10010	TDP Document
ClearCast Troubleshooting Guide (poster)	10010	TDP Document
ClearCount 1.4 Acceptance Test Checklist	1.0.3	TDP Document
ClearCount 1.4 Build Procedures	1.4.1	TDP Document
ClearCount 1.4 Database Specification	1.0.2	TDP Document
ClearCount 1.4 Election Administration Guide	1.0.9	TDP Document
ClearCount 1.4 Election Preparation and Installation Guide	1.2	TDP Document
ClearCount 1.4 Functionality Description	1.0.5	TDP Document
ClearCount 1.4 Hardware Specification	1.0.5	TDP Document
ClearCount 1.4 Maintenance Guide	1.0.6	TDP Document
ClearCount 1.4 Reporting Guide	1.0.5	TDP Document
ClearCount 1.4 Scanner Operator Guide	1.1	TDP Document
ClearCount 1.4 Security Specification	1.0.6	TDP Document
ClearCount 1.4 Software Design and Specification	1.0.7	TDP Document
ClearCount 1.4 System Identification Guide	1.0.1	TDP Document
ClearCount 1.4 System Operations Procedures	1.0.5	TDP Document
ClearCount 1.4 System Overview	1.0.6	TDP Document
ClearDesign 1.4 Acceptance Test Checklist	1.0.3	TDP Document

ClearDesign 1.4 Administration Guide	1.0.5	TDP Document
ClearDesign 1.4 Build Procedures	1.0.3	TDP Document
ClearDesign 1.4 Database Specification	1.0.3	TDP Document
ClearDesign 1.4 Functionality Description	1.0.8	TDP Document
ClearDesign 1.4 Hardware Specification	1.0.6	TDP Document
ClearDesign 1.4 Installation Guide	1.0.16	TDP Document
ClearDesign 1.4 Maintenance Guide	1.0.7	TDP Document
ClearDesign 1.4 Security Specification	1.0.8	TDP Document
ClearDesign 1.4 Software Design and Specification	1.0.9	TDP Document
ClearDesign 1.4 System Identification Guide	1.0.8	TDP Document
ClearDesign 1.4 System Overview	1.0.8	TDP Document
ClearDesign 1.4 User Guide	1.11	TDP Document
ClearVote 1.4 Approved Parts List	1.0.10	TDP Document
ClearVote 1.4 Ballot Stock and Printing Specification	1.0.3	TDP Document
ClearVote 1.4 Configuration Management Plan	1.0.8	TDP Document
ClearVote 1.4 Glossary	1.0.4	TDP Document
ClearVote 1.4 Personnel Deployment and Training Plan	1.0.5	TDP Document
ClearVote 1.4 Quality Assurance Program	1.0.6	TDP Document
ClearVote 1.4 Security Policy	1.0.6	TDP Document
ClearVote 1.4 System Overview	1.0.9	TDP Document
ClearVote 1.4 Test and Verification Specification	1.0.5	TDP Document

4.0 TEST SPECIFICATIONS

Certification testing of the Clear Ballot Group ClearVote 1.4 Voting System submitted for evaluation will be performed to ensure the applicable requirements of the EAC 2005 VVSG and the EAC Testing and Certification Program Manual, Version 2.0, are met. Additionally, all EAC Requests for Interpretation (RFI) and Notices of Clarification (NOC) relevant to the system under test will be incorporated in the test campaign. A complete listing of the EAC RFIs and NOCs is available on the EAC website.

4.1 Requirements (Strategy of Evaluation)

To evaluate the ClearVote 1.4 test requirements, each section of the EAC 2005 VVSG will be analyzed to determine the applicable tests. The EAC 2005 VVSG Volume I Sections, along with the strategy of evaluation, are described below:

Section 2: Functional Requirements

The requirements in this section shall be tested during the FCA and System Integration Test. This evaluation will utilize baseline test cases as well as specifically designed test cases and will include predefined election definitions for the input data.

Section 3: Usability and Accessibility Requirements

The requirements in this section shall be tested during the Usability and Accessibility Testing. This evaluation will utilize baseline test cases as well as specifically designed test cases and will include predefined election definitions for the input data. Pro V&V will review the results of Summative Usability Testing performed on the system to verify that the submitted test results are in Common Industry Format.

Section 4: Hardware Requirements

The requirements in this section shall be tested and/or evaluated by personnel verified by Pro V&V to be qualified to perform the testing.

Section 5: Software Requirements

The requirements in this section shall be tested utilizing a combination of review and functional testing during the Source Code Review, TDP Review, and FCA.

Section 6: Telecommunications Requirements

The requirements in this section shall be tested utilizing baseline test cases as well as specifically designed test cases.

Section 7: Security Requirements

The requirements in this section shall be tested during the Source Code Review, Security Tests, and FCA.

Section 8: Quality Assurance Requirements

The requirements in this section shall be tested throughout the test campaign. This testing will utilize a TDP Review in conjunction with the Source Code Review and PCA to determine compliance to the EAC 2005 VVSG requirements and the requirements stated in the Clear Ballot Group technical documentation. The review of the Quality Assurance documentation will focus on Clear Ballot Group's adherence to its stated QA processes.

Section 9: Configuration Management Requirements

The requirements in this section shall be tested throughout the test campaign. This testing will utilize a TDP Review in conjunction with the Source Code Review and PCA to determine compliance to the EAC 2005 VVSG requirements and the requirements stated in the Clear Ballot Group technical documentation. The review of the Configuration Management documentation will focus on Clear Ballot Group's adherence to its stated CM processes.

Throughout the test campaign, Pro V&V personnel shall maintain a test log identifying the system and equipment under test and any records of deviations to the test plan along with the rationale for performing the deviations. Pro V&V shall also utilize an internal bug tracking system to record and track all issues and/or discrepancies noted during the test campaign.

4.1.1 Mapping of Requirements to Equipment Type and Features

This information shall be included in the VSTL Requirements Matrix provided to the EAC prior to the Test Report review.

4.1.2 Rationale for 'Not Applicable' Requirements

The ClearVote 1.4 is a paper-based system that supports a closed network. Therefore, all EAC 2005 VVSG requirements, with the exceptions listed below, will be evaluated as part of this test campaign.

- Volume I, Section 2.3.1.3, 2.3.2, and 2.3.3.3 (Functional Requirements for DRE Systems)
- Volume I, Section 3 (Usability and Accessibility Requirements for DRE System)
- Volume I, Section 4.1.4.3 and 4.1.6.2 (Hardware Requirements for DRE Systems)
- Volume I, Section 6.2.6 (Telecommunications Requirements)

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

The rationale for not evaluating the ClearVote 1.4 to the indicated sections is described in following table.

Table 4-1. Not Applicable Requirements

EAC 2005 VVSG Version 1 Volume I, Section	Rationale for ‘Not Applicable’
2.3.1.3, 2.3.2, 2.3.3.3	These requirements pertain to DRE Systems; the ClearVote 1.4 is a paper-based system.
3	These requirements pertain to DRE Systems; the ClearVote 1.4 is a paper-based system.
4.1.4.3, 4.1.6.2	These requirements pertain to DRE Systems; the ClearVote 1.4 is a paper-based system.
6.2.6	These requirements are written for use of public networks. The ClearVote 1.4 does not utilize public networks.
7.5.2-7.5.4	These requirements are written for use of public networks. The ClearVote 1.4 does not utilize public networks.
7.6	This system does not support transmission over public networks.
7.7	No wireless technology is utilized in this system.
7.9	This system does not contain a Voter Verifiable Paper Audit Trail (VVPAT).

4.2 Hardware Configuration and Design

The ClearVote 1.4 Voting System is a paper-based voting system that consists of the following major components: ClearDesign, ClearAccess, ClearCast, and ClearCount. ClearVote is comprised of one proprietary hardware component (ClearCast) and two COTS hardware components (ClearCount) and (ClearAccess). All ClearDesign functions are managed by proprietary software running on COTS PCs/laptops/servers, which is excluded from hardware testing.

ClearCast – The ClearCast component will be subjected to the full suite of hardware and electrical testing required by the EAC 2005 VVSG as well as Usability, Security, Maintainability, Availability, Safety, and Accuracy Testing.

ClearAccess – The ClearAccess component will be subjected to the full suite of hardware and electrical testing required by the EAC 2005 VVSG as well as Usability, Security, Maintainability, Availability, and Accuracy Testing.

ClearCount – The ClearCount component is unmodified COTS equipment and will be exempt from non-operational hardware testing. ClearCount will be subjected to Temperature/Power Variation Testing in conjunction with the ClearCast and ClearAccess in addition to being utilized in functional and system level testing such as accuracy, volume and stress, and system integration during the test campaign.

4.3 Software System Functions

The ClearVote 1.4 Election Management System (EMS) consists of a set of applications responsible for all pre-voting and post-voting activities used in election definition and management process. The ClearVote 1.4 EMS applications are as follows:

- ClearDesign
- ClearCount

4.4 Test Case Design

Test cases are designed based on the manufacturer's design specifications and the relevant technical requirements set forth by the VVSG. Test cases shall be examined based on the following aspects of the voting system:

- Hardware qualitative examination design
- Hardware environmental test case design
- Software module test case design and data
- Software functional test case design
- System level test case design

Test cases shall provide information regarding the sequence of actions to be performed for the execution of a test, the requirements being met, the test objective, test configuration, equipment needed, special requirements, assumptions, and pass/fail criteria. Once the test cases are finalized, they will be validated and published for use in the test campaign. The validation of the test case will be accomplished by Technical Review and Approval. This validation will include the following: confirmation of adequate test coverage of all requirements; confirmation that test case results are not ambiguous and gave objective pass/fail criteria; and conformation that any automated test suites will produce valid results.

Prior to execution of the required test cases, the system under test will undergo testing initialization. The testing initialization will seek to establish the baseline for testing and ensure that the testing candidate matches the expected testing candidate and that all equipment and supplies are present.

The following will be completed during the testing initialization:

- Ensure proper system of equipment. Check network connections, power cords, keys, etc.
- Check version numbers of (system) software and firmware on all components.
- Verify the presence of only the documented COTS.
- Ensure removable media is formatted and does not contain any data.
- Ensure batteries are fully charged.
- Inspect supplies and test decks.
- Record protective counter on all tabulators.
- Review physical security measures of all equipment.

- Record basic observations of the testing setup and review.
- Record serial numbers of equipment.
- Retain proof of version numbers.

4.4.1 Hardware Qualitative Examination Design

A list of hardware tests, and the components which will be subjected to each hardware test are listed below:

Electrical Tests:

- Electrical Power Disturbance – ClearCast, ClearAccess
- Electromagnetic Radiation – ClearCast, ClearAccess
- Electrostatic Disruption – ClearCast, ClearAccess
- Electromagnetic Susceptibility – ClearCast, ClearAccess
- Electrical Fast Transient – ClearCast, ClearAccess
- Lightning Surge – ClearCast, ClearAccess
- Conducted RF Immunity – ClearCast, ClearAccess
- Magnetic Fields Immunity – ClearCast, ClearAccess
- Electrical Supply – ClearCast, ClearCount (fi-6400, fi-6800, fi-7180), ClearAccess

Environmental Tests:

- Bench Handling – ClearCast, ClearAccess
- Vibration – ClearCast, ClearAccess
- Low Temperature – ClearCast, ClearAccess
- High Temperature – ClearCast, ClearAccess
- Humidity – ClearCast, ClearAccess
- Temperature Power Variation - ClearCast, ClearCount (fi-6400, fi-6800, fi-7180), ClearAccess
- Acoustic – ClearAccess
- Safety Testing – ClearCast

4.4.1.1 Mapping of Requirements to Specific Interfaces

This information shall be included in the VSTL Requirements Matrix provided to the EAC prior to the Test Report review.

4.4.2 Hardware Environmental Test Case Design

No previous examinations have been performed on the ClearVote 1.4 Voting System. The voting system hardware shall be subjected to the tests specified in Section 4.4.1. Testing will be performed by personnel verified by Pro V&V to be qualified to perform the test. Pro V&V will utilize NTS Longmont for the performance of the electrical and environmental tests. All pre/post-tests shall be conducted by Pro V&V personnel.

4.4.3 Software Module Test Case Design and Data

Pro V&V shall review the manufacturer's program analysis, documentation, and module test case design and shall evaluate the test cases for each module with respect to flow control parameters and entry/exit data. As needed, Pro V&V shall design additional test cases to satisfy the coverage criteria specified in Volume II, Section 7.2.1.

Component Level Testing will be implemented during the FCA for each component and subcomponent. During the Source Code Review, Compliance Builds, and Security Testing, Pro V&V will utilize limited structural-based techniques (white-box testing). Additionally, specification-based techniques (black-box testing) will be utilized for the individual software components.

Pro V&V shall define the expected result for each test and the ACCEPT/REJECT criteria for certification. If the system performs as expected, the results will be accepted. If the system does not perform as expected, an analysis will be performed to determine the cause. The test will be repeated in an attempt to reproduce the results. If the failure can be reproduced and the expected results are not met, the system will have failed the test. If the results cannot be reproduced, the test will continue. All errors encountered will be documented and tracked through resolution.

4.4.4 Software Functional Test Case Design and Data

Pro V&V shall review the manufacturer-submitted test plans and data to verify that the individual performance requirements specified in the EAC 2005 VVSG and the TDP are reflected in the software. As part of this process, Pro V&V shall review the manufacturer's test case design and prepare a detailed matrix of system functions and the test cases that exercise them. During this review, emphasis shall be placed on those functions where the manufacturer data on module development reflects significant debugging problems, and on functional tests that resulted in high error rates.

Pro V&V shall also prepare a test procedure describing all test ballots, operator procedures, and the data content of output reports. Pro V&V shall define abnormal input data and operator actions and then design test cases to verify that the system is able to handle and recover from these abnormal conditions. Pro V&V shall define the expected result for each test and the ACCEPT/REJECT criteria for certification. If the system performs as expected, the results will be accepted. If the system does not perform as expected, an analysis will be performed to determine the cause. The test will be repeated in an attempt to reproduce the results. If the failure can be reproduced and the expected results are not met, the system will have failed the test. If the results cannot be reproduced, the test will continue. All errors encountered will be documented and tracked through resolution.

4.4.5 System-Level Test Case Design

System Level testing will be implemented to evaluate the complete system. This testing will include all proprietary components (software, hardware, and peripherals) and COTS components (software, hardware, and peripherals) in a configuration of the system's intended use. For software system tests, the tests shall be designed according to the stated design objective without consideration of its functional specification. The system level hardware and software test cases shall be prepared independently to assess the response of the hardware and software to a range of conditions.

4.5 Security Functions

The objective of the Security Testing is to evaluate the effectiveness of the voting system in detecting, preventing, recording, reporting, and recovering from security threats. To evaluate the integrity of the system, Pro V&V shall develop specifically designed test cases in an attempt to defeat the access controls and security measures documented in the system TDP. A threat matrix shall be created to determine the risks and vulnerabilities. An evaluation of the system shall be accomplished by utilizing a combination of functional testing, source code review, and Fortify Static Code Analyzer (SCA). All findings will be reported to the EAC and Clear Ballot Group.

4.6 TDP Evaluation

In order to determine full compliance with the EAC 2005 VVSG, three phases of TDP review shall be conducted:

- **Initial TDP Review:** The first review is performed to determine whether the TDP submitted is complete enough to perform TDP review. This is an abbreviated review. Each document is read to determine whether it provides enough description of the submitted voting system components and whether it at least generically addresses VVSG requirements. The results of the review are used in determining contractual requirements for the test campaign.
- **Compliance Review:** This review is conducted on a document-by-document basis to determine if every regulatory, state, or manufacturer-stated requirement has been met based on the context of each requirement. This review does not address consistency or completeness of documents. The review is more complex than the initial TDP review. Results of the review of each document are entered on the TDP Review Checklist and are reported to the manufacturer for disposition of any anomalies. This process is ongoing until all anomalies are resolved. Any revised documents during the TDP review process are compared with the previous document revision to determine changes made, and the document is re-reviewed to determine whether subject requirements have been met.
- **Consistency/Completeness Review:** The third TDP review is completed after the review for compliance has been performed (the Consistency/Completeness TDP Review may overlap the Compliance Review in part). This review is to ensure the information included in the TDP documents is consistent across documents, especially in component naming, software and firmware versioning, and the hardware, software, and firmware included with the voting system submitted for testing. Any revisions to a document during the TDP review process may affect other documents which will also need to be revised. As with the other TDP reviews, the TDP Review Checklist is utilized to report any anomalies to the manufacturer for resolution, if required. The TDP review continues until all anomalies have been satisfactorily resolved.

A listing of all documents contained in the ClearVote 1.4 TDP is provided in Table 4-2.

Table 4-2. TDP Documents

Material	Version	Description
ClearDesign	1.4.3	EMS Software
ClearAccess	1.4.1	BMD software
ClearCount	1.4.2	Central Count and Tabulation Software
ClearCast	1.4.2	Precinct Count Software
ClearAccess 1.4 Acceptance Test Checklist	1.0.1	TDP Document
ClearAccess 1.4 Build Procedures	1.0.4	TDP Document
ClearAccess 1.4 Functionality Description	1.5	TDP Document
ClearAccess 1.4 Hardware Specification	1.4	TDP Document
ClearAccess 1.4 Installation Guide	1.4	TDP Document
ClearAccess 1.4 Maintenance Guide	1.5	TDP Document
ClearAccess 1.4 Poll Worker Guide	1.6.2	TDP Document
ClearAccess 1.4 Security Specification	1.4.2	TDP Document
ClearAccess 1.4 Software Design and Specification	1.4.1	TDP Document
ClearAccess 1.4 Supervisor Guide	1.7.3	TDP Document
ClearAccess 1.4 System Identification Guide	1.0.1	TDP Document
ClearAccess 1.4 System Overview	1.5.1	TDP Document
ClearAccess 1.4 Voter Guide	1.1	TDP Document
ClearAccess Poll Worker Instructions Multi Day Voting (poster)	10010	TDP Document
ClearAccess Poll Worker Instructions (poster)	10010	TDP Document
ClearAccess Simplified Voter Instructions (poster)	10010	TDP Document
ClearCast 1.4 Acceptance Test Checklist	1.1.1	TDP Document
ClearCast 1.4 Approved Parts List	1.1	TDP Document
ClearCast 1.4 Build Procedures	1.0.1	TDP Document
ClearCast 1.4 Functionality Description	1.4	TDP Document
ClearCast 1.4 Hardware Specification	1.3	TDP Document
ClearCast 1.4 Installation Guide	1.1.1	TDP Document
ClearCast 1.4 Maintenance Guide	1.5.1	TDP Document
ClearCast 1.4 Poll Worker Guide	1.5.1	TDP Document
ClearCast 1.4 Security Specification	1.3	TDP Document
ClearCast 1.4 Software Design and Specification	1.3.1	TDP Document
ClearCast 1.4 Supervisor Guide	1.6.1	TDP Document
ClearCast 1.4 System Identification Guide	1.0.1	TDP Document
ClearCast 1.4 System Overview	1.3.1	TDP Document
ClearCast Tabulator Quick Start Guide (poster)	10010	TDP Document
ClearCast Troubleshooting Guide (poster)	10010	TDP Document
ClearCount 1.4 Acceptance Test Checklist	1.0.3	TDP Document
ClearCount 1.4 Build Procedures	1.4.1	TDP Document
ClearCount 1.4 Database Specification	1.0.2	TDP Document
ClearCount 1.4 Election Administration Guide	1.0.9	TDP Document
ClearCount 1.4 Election Preparation and Installation Guide	1.2	TDP Document
ClearCount 1.4 Functionality Description	1.0.5	TDP Document

ClearCount 1.4 Hardware Specification	1.0.5	TDP Document
ClearCount 1.4 Maintenance Guide	1.0.6	TDP Document
ClearCount 1.4 Reporting Guide	1.0.5	TDP Document
ClearCount 1.4 Scanner Operator Guide	1.1	TDP Document
ClearCount 1.4 Security Specification	1.0.6	TDP Document
ClearCount 1.4 Software Design and Specification	1.0.7	TDP Document
ClearCount 1.4 System Identification Guide	1.0.1	TDP Document
ClearCount 1.4 System Operations Procedures	1.0.5	TDP Document
ClearCount 1.4 System Overview	1.0.6	TDP Document
ClearDesign 1.4 Acceptance Test Checklist	1.0.3	TDP Document
ClearDesign 1.4 Administration Guide	1.0.5	TDP Document
ClearDesign 1.4 Build Procedures	1.0.3	TDP Document
ClearDesign 1.4 Database Specification	1.0.3	TDP Document
ClearDesign 1.4 Functionality Description	1.0.8	TDP Document
ClearDesign 1.4 Hardware Specification	1.0.6	TDP Document
ClearDesign 1.4 Installation Guide	1.0.16	TDP Document
ClearDesign 1.4 Maintenance Guide	1.0.7	TDP Document
ClearDesign 1.4 Security Specification	1.0.8	TDP Document
ClearDesign 1.4 Software Design and Specification	1.0.9	TDP Document
ClearDesign 1.4 System Identification Guide	1.0.8	TDP Document
ClearDesign 1.4 System Overview	1.0.8	TDP Document
ClearDesign 1.4 User Guide	1.11	TDP Document
ClearVote 1.4 Approved Parts List	1.0.10	TDP Document
ClearVote 1.4 Ballot Stock and Printing Specification	1.0.3	TDP Document
ClearVote 1.4 Configuration Management Plan	1.0.8	TDP Document
ClearVote 1.4 Glossary	1.0.4	TDP Document
ClearVote 1.4 Personnel Deployment and Training Plan	1.0.5	TDP Document
ClearVote 1.4 Quality Assurance Program	1.0.6	TDP Document
ClearVote 1.4 Security Policy	1.0.6	TDP Document
ClearVote 1.4 System Overview	1.0.8	TDP Document
ClearVote 1.4 Test and Verification Specification	1.0.5	TDP Document

4.7 Source Code Review

Pro V&V will review the submitted source code to the EAC 2005 VVSG and the manufacturer-submitted coding standards. Prior to initiating the software review, Pro V&V shall verify that the submitted documentation is sufficient to enable: (1) a review of the source code and (2) Pro V&V to design and conduct tests at every level of the software structure to verify that design specifications and performance guidelines are met.

4.8 QA & CM System Review

The Clear Ballot Group Quality and Configuration Management Manuals shall be reviewed for their fulfillment of Volume I, Sections 8 and 9, and the requirements specified in Volume II, Section 2.

The requirements for these sections establish the quality assurance and configuration standards for voting systems to which manufacturers must conform and require voting system manufacturers to implement a quality assurance and configuration management program that is conformant with recognized ISO standards. As part of the review process, the Clear Ballot Group TDP documents will be reviewed to determine if the stated policies are being followed.

5.0 TEST DATA

The following subsections provide information concerning test data recording, criteria, and reduction.

5.1 Data Recording

All equipment utilized for test data recording shall be identified in the test data package. The output test data shall be recorded in an appropriate manner as to allow for data analysis. For source code and TDP reviews, results shall be compiled in reports and submitted to Clear Ballot Group for resolution.

5.2 Test Data Criteria

The ClearVote 1.4 Voting System shall be evaluated against all applicable requirements contained in the EAC 2005 VVSG. The acceptable range for system performance and the expected results for each test case shall be derived from the manufacturer-submitted technical documentation and the EAC 2005 VVSG.

5.3 Test Data Reduction

Test data shall be processed and recorded in the test log book and the relevant Test Cases.

6.0 TEST PROCEDURE AND CONDITIONS

The following subsections detail the facility requirements, test setup conditions, and sequence of testing.

6.1 Facility Requirements

Unless otherwise annotated, all testing shall be conducted at the Pro V&V test facility located in Huntsville, AL, by personnel verified by Pro V&V to be qualified to perform the test.

Unless otherwise specified herein, testing shall be performed at the following standard ambient conditions and tolerances:

- Temperature: 68-75° F ($\pm 4^\circ\text{F}$)
- Relative Humidity: Local Site Humidity
- Atmospheric Pressure: Local Site Pressure
- Time Allowable Tolerance: $\pm 5\%$

Testing performed at third-party laboratories will be subject to the test parameters and tolerances defined by VVSG. If not specified in VVSG, the test facilities' standard parameters and tolerances will be used. These will be reported in the final Test Report.

6.2 Test Set-up

All voting system equipment shall be received and documented using Pro V&V proper QA procedures. Upon receipt of all hardware, an inspection will be performed to verify that the equipment received is free from obvious signs of damage and/or degradation that may have occurred during transit. If present, this damage shall be recorded, photographed, and reported to the Clear Ballot Group Representative. Additionally, a comparison shall be made between the recorded serial numbers/part numbers and those listed on shipper's manifest and any discrepancies shall be reported to the Clear Ballot Group Representative. TDP items and all source code received shall be inventoried and maintained by Pro V&V during the test campaign.

During test performance, the system shall be configured as would be for normal field use. This includes connecting all supporting equipment and peripherals.

6.3 Test Sequence

The ClearVote 1.4 Voting System will be evaluated against all applicable requirements in the EAC 2005 VVSG. There is no required sequence for test performance.

7.0 TEST OPERATIONS PROCEDURES

Pro V&V will identify PASS/FAIL criteria for each executed test case. The PASS/FAIL criteria will be based on the specific expected results of the system. In the case of an unexpected result that deviates from what is considered standard, normal, or expected, a root cause analysis will be performed.

Pro V&V will evaluate every applicable EAC 2005 VVSG requirement. Any deficiencies noted will be reported to the EAC and the manufacturer. If it is determined that there is insufficient data to determine compliance, this test plan will be altered and additional testing will be performed.

7.1 Proprietary Data

All data and documentation considered by the manufacturer to be proprietary will be identified and documented in an independent submission along with a Notice of Protected Information.

APPENDIX A
PROJECT SCHEDULE

Task Name	Start Date	End Date	Assigned To	Duration	Predecessors
Readiness for Testing (TRR)	04/22/16	05/06/16		11d	
EAC Application Submitted	04/22/16	04/22/16	Stephen	1d	
TDP Delivered	04/25/16	04/25/16	Diane	1d	
Source Code Delivered	04/26/16	04/26/16	Jack	0	
Equipment Delivered	04/27/16	04/27/16	Stephen	0	
TDP Verification	04/28/16	04/28/16	Diane	1d	
Source Code Verification	04/28/16	04/28/16	Jack	1d	
Equipment Verification	04/28/16	04/28/16	Stephen	1d	6
System Setup	04/29/16	04/29/16	Stephen	1d	9
Mark Reading Test	04/29/16	04/29/16	Stephen	1d	
VRT Status Update	05/02/16	05/02/16	Stephen	1d	
Application Approved by EAC	05/03/16	05/04/16	Stephen	2d	12
TDP	01/02/17	10/25/17		213d	
Initial Review	01/07/17	05/26/17	Diane	98d	
Compliance Review	05/29/17	10/09/17	Diane	80d	16
Final review	10/10/17	10/25/17	Diane	10d	17
Test Plan	11/07/16	06/19/17		196d	
Test Plan Creation	11/07/16	11/18/16	Wendy	10d	
Vendor Review & Comments	11/21/16	11/28/16	Wendy	6d	19
EAC Submission & Review	11/29/16	12/19/16	Wendy	15d	20
EAC Comment Review & Update	12/20/16	01/02/17	Wendy	10d	21
EAC Submission & Review of Revision	06/06/17	06/19/17	Wendy	10d	22
EAC Approved Test Plan	06/19/17	06/19/17	Wendy	0d	23
Source Code	05/12/17	06/21/17		27d	
Automated Review	05/12/17	05/15/17	Jack	2d	
Source Code Review	05/16/17	06/02/17	Jack	14d	26
Source Code Re-Review	06/05/17	06/07/17	Jack	3d	27
Document Review	06/09/17	06/13/17	Jack	3d	28
Compliance Build	06/14/16	06/21/17	Jack	5d	29
System Delivery & Setup	04/21/17	06/22/17		43d	
PCA	04/21/17	05/26/17	Stephen	25d	
System Setup	05/27/17	06/12/17	Stephen	10d	32
System Loads & Hardening	06/12/17	06/22/17	Stephen	8d	
Hardware Testing	06/23/17	07/28/17		24d	
Electrical Testing	06/23/17	07/06/17	Walker	10d	
Environmental Testing	06/23/17	07/18/17	Walker	18d	
Temp Power	07/19/17	07/28/17	Walker	8d	37
Electrical Supply	07/19/17	07/19/17	Stephen	1d	37
Maintainability	07/19/17	07/20/17	Stephen	2d	37
Acoustic Testing	07/19/17	07/20/17	Stephen	2d	37

Product Safety	07/19/17	07/20/17	Stephen	2d	37
System Level Testing	07/21/17	10/11/17		59d	
FCA	07/21/17	08/31/17	Stephen	30d	41
Security (include SCAP)	09/01/17	09/06/17	Becky	4d	43
Usability	09/01/17	09/05/17	Stephen	3d	43
Accessibility	09/01/17	09/05/17	Stephen	3d	45
Volume & Stress (system limits)	09/07/17	09/13/17	Stephen	5d	45
Accuracy	09/14/17	09/20/17	Stephen	5d	47
Regression Testing	09/21/17	09/29/17	Stephen	7d	48
Trusted Build	10/02/17	10/03/17	Jack	2d	49
System Loads & Hardening	10/04/17	10/06/17	Stephen	3d	50
System Integration	10/09/17	10/11/17	Stephen	3d	51
Test Report	10/12/17	12/15/17		44d	
Test Report Creation	10/12/17	10/25/17	Wendy	10d	49
Vendor Review & Comments	10/25/17	10/26/17	Wendy	2d	54
EAC Submission & Review	10/26/17	11/27/17	Wendy	20d	55
EAC Comment Review & Update	11/28/17	11/30/17	Wendy	3d	56
EAC Submission & Review of Revision	12/01/17	12/14/17	Wendy	10d	57
EAC Approved Test Report	12/15/17	12/15/17	Wendy	1d	58