

EAC Certification Test Plan - Modification

Document Number: HRT-25003-CTP-04

Hart InterCivic Verity Vanguard 1.1 v4.0

Prepared for:

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Vendor System	<i>Verity Vanguard 1.1</i>
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1 INTRODUCTION

This Modification Test Plan outlines the test approach SLI Compliance will follow when performing system modification testing on the **Hart Verity Vanguard 1.1** voting system against the Election Assistance Commission Voluntary Voting System Guidelines (EAC VVSG) version 2.0. **Verity Vanguard 1.1** is a modification of **Verity Vanguard 1.0**, certified by the EAC on July 7th, 2025, with limited changes. The voting system will be tested based on the “modified system” requirements, as set forth in section 4.7.2.2 of the “EAC Voting System Testing and Certification Program Manual, version 3.0”. The purpose of this document is to provide a clear understanding of the work SLI Compliance will conduct and a detailed plan outlining the test effort.

When the testing is complete, SLI Compliance will submit a Certification Test Report that details all test results and findings from the Certification Test effort, as well as a recommendation to the EAC.

1.1 Description and Overview of the Certified System

This section contains a description of the previously certified **Verity Vanguard 1.0** voting system, the specific modifications to the current system version, and the impact of those modifications on the system and certification testing.

1.1.1 Definition of the Baseline Verity Vanguard 1.0 Certified System

This modification project builds upon the foundation established in **Verity Vanguard 1.0**, which contains the applications for **Vanguard Define**, **Vanguard Deploy**, **Vanguard Capture**, **Vanguard Results**, as well as the polling place devices **Vanguard Boost**, **Vanguard Flex**, **Vanguard Adapt** and **Vanguard Vault**.

1.1.2 Verity Vanguard 1.1 System Overview

The **Hart InterCivic Verity Vanguard 1.1** voting system is a paper-based voting system comprised of both precinct and central count tabulators along with a Ballot Marking Device (BMD) and a hybrid BMD/Precinct Tabulator. All polling place devices are able to utilize Americans with Disabilities Act (ADA) components.

The **Verity Vanguard 1.1** voting system’s major components include **Vanguard Workspace**, **Vanguard Define**, **Vanguard Deploy**, **Vanguard Capture**, **Vanguard Results**, **Vanguard Boost**, **Vanguard Flex**, **Vanguard Adapt** and **Vanguard Vault**.

The Vanguard Workspace (EMS)

Vanguard Workspace is the Vanguard workstation home screen. The Vanguard workspace displays tiles for each of the installed Vanguard components. The



components displayed are based on the roles and permissions assigned to the current user by the System Administrator.

The Manage application is used to create new elections, archive and restore elections, and export signed elections.

The Users application is used to create and manage Vanguard users and write security tokens.

The Settings application is used to perform additional workstation functions such as setting the clock and exporting file hashes.

Additionally, unlockable applications may be displayed on the lower right of the Home screen. These applications provide additional functionality when working with elections in Vanguard.

Vanguard Define (Pre-Election EMS)

Vanguard Define is a component of the Verity Vanguard voting system used by election officials to enter election data for contests, candidates, proposition text, translations, and audio. Vanguard Define also provides the user with controls for proofing of data and layout and performs validation prior to locking the data to ensure its readiness for use in Vanguard Deploy, the election definition software.

Vanguard Deploy (Pre-Election EMS)

Vanguard Deploy is used by officials to complete pre-voting tasks for creating and generating an election definition and ballots. Vanguard Deploy provides a ballot layout proofing process. The process establishes relationships between election data, jurisdiction, and polling place data, for the shared election definition. Vanguard Deploy will create the portable media, vDrives, to provide a method of transferring the shared election definition to Verity Vanguard voting devices and workstations.

Note that Vanguard Define and Vanguard Deploy share the same environment, so are fielded on the same workstation.

Vanguard Define/Deploy can include a stand-alone workstation or multiple Vanguard Capture workstations that are networked on a closed LAN in a server/client configuration. The closed LAN cannot connect to other LANs or systems, ensuring the air gap remains for security of data.

Vanguard Capture (Central Scan)

Vanguard Capture is used by officials for paper ballot scanning, contest resolution, and conversion of voter selection marks to electronic Cast Vote Records (CVRs). Once the CVRs are written to vDrive(s) they can be transferred into Vanguard Results for vote tabulation and reporting of election results. Vanguard Capture records cast vote records only; it does not tabulate.

Vanguard Capture can include a stand-alone workstation or multiple Vanguard Capture workstations that are networked on a closed LAN in a server/client



configuration. The closed LAN cannot connect to other LANs or systems, ensuring the air gap remains for security of data.

Vanguard Results (Post-Election EMS)

Vanguard Results is used by officials to complete post-voting functionality to tabulate election results and generate reports. Vanguard Results receives the CVRs from portable media devices (vDrives) used to record CVRs from Vanguard Vault devices or Vanguard Capture workstations. Vanguard Results can be used by officials to resolve Vault or Vanguard Capture write-in votes for paper ballots that were manually marked.

Vanguard Results can also be used to collect and store all election logs from every Verity Vanguard device used in the election, allowing for complete election audit log reviews.

Vanguard Results can include a stand-alone workstation or multiple Vanguard Results workstations that are networked on a closed LAN in a server/client configuration. The closed LAN cannot connect to other LANs or systems, ensuring the air gap remains for security of data.

Vanguard Manage (EMS)

Vanguard Manage is available only within server and standalone workstation software applications. This software enables authorized users to add, copy, import, export, archive, restore, and manage elections. Once an election is added or imported in the Election Management application, the election can be opened and handled per the features available within the Vanguard software installed on that workstation.

Vanguard Boost (Polling Place Ballot Issuance)

Vanguard Boost is a poll worker facing device designed to improve voter service by optimizing ballot issuance in the polling place. Vanguard Boost can be utilized by poll workers in two ways. Boost may be used to print blank paper ballots on demand, using an attached ballot printer. Boost may also be used to issue VotePasses, which allow voters to access, mark, and print a printed vote record using Vanguard Flex or Adapt. Vanguard Boost does not store vote data.

Vanguard Flex (Polling Place BMD)

Vanguard Flex is a universal ballot marking device that produces an auditable summary ballot of a voter's choices. Voters can mark their ballots using the touchscreen interface or a wide variety of accessible controls. Printed summary ballots are then scanned in Verity Vault for tabulation. New to Vanguard 1.1, Vanguard Flex now supports a full-faced ballot, utilizing an attached external printer.

Vanguard Vault (Polling Place Precinct Scanner)



Vanguard Vault is a polling place scanning device that captures voter choices whether using ballots marked by hand or machine, including summary ballots (printed vote records (PVRs)).

Vanguard Adapt (Polling Place Limited Dexterity Mark, Verify and Cast device)

Vanguard Adapt is an all-in-one voting device that produces an auditable summary ballot of a voter's choices. Voters can mark their ballots using the touchscreen interface or a wide variety of accessible controls. Vanguard Adapt enables voters to mark, verify, and cast their ballot all without touching a piece of paper.

Vanguard Libraries (EMS)

Vanguard Libraries is an application that can be unlocked on any Vanguard Define/Deploy workstation. Libraries allows users to save translations and audio from any Vanguard election and use them in future elections. Translations and audio in Vanguard Libraries can be imported into any election in the Vanguard Define application on the same workstation.

Vanguard Test Decks (EMS)

Vanguard Test Decks is an application that can be unlocked on any Vanguard Define/Deploy workstation. Test Decks allows users to generate a pre-marked set of ballots (a "Test Deck") that can be used for Logic and Accuracy Testing of the Vanguard voting system. Test Decks allows users to select a marking pattern and generate a test deck which is then available to print and/or export within the Vanguard Deploy software application.

Vanguard Ranked Choice (EMS)

Vanguard Ranked Choice is an application that can be unlocked on any Vanguard Results workstation. Ranked Choice allows users to perform tabulation of ranked choice contest results that have been read into Vanguard Results.

1.1.3 Modifications Implemented into Verity Vanguard 1.1

Verity Vanguard 1.1 is a modification of the EAC certified **Verity Vanguard 1.0** system.

The modifications to **Verity Vanguard 1.1** address multiple aspects of the system, including features for devices and workstations, as well as associated documentation updates.

The following modifications are implemented in this release:

Features:

- Support for printing a full ballot from Flex with an external COTS printer – Driven by a distinct software load with no change to device hardware, Flex



can now be paired with a COTS printer (HP LaserJet Pro 4001dn) to print a full ballot.

- Updated Privacy Screens – Flex now supports a new privacy screen configuration to physically block the onboard thermal ballot printer to avoid voter confusion when used with the full ballot configuration.
- Updated configuration control – Vanguard now supports the ability to define the ballot marking configuration. In “Manage” users can select “Paper Ballot”, “Printed Vote Records”, or “Paper Ballots and Printed Vote Records” as the configuration type. When only “Paper Ballot” is selected, Define and Deploy hide unrelated “PVR” only fields for data entry.
- Vanguard ID indicator update – Vanguard ID includes an onscreen indicator on Flex for at-a-glance verification of the configured ballot type. The Vanguard ID screen will indicate “PVR” for summary ballots and “Paper” for full ballots.

New Supported COTS Equipment

- Support for the DJI brand Power 1000 UPS. This UPS may be used on the Vanguard workstations or with an external printer attached to the Flex and Boost. This UPS is included in the modification as the existing Duracell DR660PSS model is end of life.
- Support for a new workstation monitor model, the HP 324pf for use on all Vanguard workstation deployments. This monitor is included in the modification as the HP P24 G5 model is end of life.

Other Updates

- Telerik UI for WPF, a third-party library used on workstation applications for UI development, is updated from 2023.2.606.45 to 2025.1.211.462.
- A second supported paper option is added for the Adapt device, Hammermill Premium Color Copy paper (102467)

Defect Corrections

- Unclear Warning Message for Cross-Party Endorsement Functionality
 - Found On: Vanguard Adapt when running a grid-based general election
 - Reason for Change: Message may be confusing for voters
 - Change Made: Message changed as shown below:
From: ‘You have made more choices than the number allowed. To change a choice, you must first remove a previous choice and then make your new choice.’
To: ‘You cannot select the same candidate more than once.’
 - Validation Performed by Hart:



Loaded a grid-based general election on Adapt that contains a contest with a cross-party endorsed candidate that allows for 'Vote for 3'. Marked a candidate who is not cross-party endorsed. Mark the second and third candidates as the candidate that was cross endorsed by two parties. The correct message was shown.

- Contextual Help Screen when Create Recovery vDrive is completed mentions "Count"
 - Found On: Devices
 - Reason for Change: The help screen should mention the Vanguard application "Results"
 - Change Made: Help screen text updated to "Complete: The Recovery vDrive was successfully created and can be taken to the Results application for tabulation and/or reporting."
 - Validation Performed by Hart:

Successfully created a recovery vDrive on all devices then entered the Help menu to confirm text was updated as expected.
- Next Unresolved button used for locating unresolved write-ins may not display the next sequential record
 - Found On: Capture
 - Reason for Change: The design intent is to go to the immediate next contest that needs adjudication.
 - Change Made: Update SQL query to explicitly ensure records are fetched in order.
 - Validation Performed by Hart:

Tested using an election that required significant write-in adjudication. The next unresolved button moved to all unresolved write-ins "in order" for adjudication.
- The Brother HL-L6400DWVS printer prints reports in Duplex by default (flip on long edge), inconsistent with other printers that print reports in Simplex
 - Found On: Results
 - Reason for Change: No effect on ballots. Updated for consistency as other supported printer models print reports in Simplex by default.
 - Change Made: Printer configuration file updated.
 - Validation Performed by Hart:

Reports printed in Vanguard Results on Brother printer.



- A Closed Primary Entity Election may be successfully created via CSV data import when when the “AllowNonPartisanVotingOnThisContest” value is set to true
 - Found On: Define
 - Reason for Change: Non-partisan voting is not permitted on partisan contests in an Entity election.
 - Change Made: Corrected validation so that the CSV data import will fail in this instance.
 - Validation Performed by Hart:
Import of data file on Define now correctly fails with a descriptive error message.

Documentation Added

The following documentation is added to support the changes described in this document.

- Verity Vanguard 1.1 Change Notes: Update from 1.0 to 1.1 (1000834)
 - This document. Describes the updates to the Vanguard 1.1 system modification.
- Vanguard Flex 1.1 Full Ballot Configuration Device Support Guide
 - A new user document is added to describe support for the Vanguard Flex when used for full ballots.
- Vanguard Flex 1.1 Full Ballot Configuration Polling Place Guide
 - A new user document is added to describe polling place use of the Vanguard Flex when used for full ballots.
- Usability Impact Statement
 - Added to indicate that existing usability studies were not impacted by the modification to add full ballot support to Vanguard Flex.

Documentation Updated or Replaced

The following documentation is updated or revised to support the changes described in this document.

- Verity Vanguard 1.0 Implementation Statement (1000814)
 - Removed and replaced with the Verity Vanguard 1.1 Implementation Statement (1000833)



- Vanguard Paper Specifications (1000802)
 - Updated to add equivalent approved paper for Vanguard Adapt, Hammermill Premium Color Copy paper
- Verity Vanguard 1.0 Workstation OS Creation and Configuration (1000809)
 - Minor updates to further describe the disabling of unused windows services.
- Verity Vanguard 1.0 Device OS Creation and Configuration (1000810)
 - Minor updates to further describe the disabling of unused windows services.
- Verity Vanguard 1.0 System Overview (1000812)
 - Revised to account for the updates to the Verity Vanguard 1.1 system described in this document.
- Vanguard 1.0 Creation of the Trusted Build Environment (1000811)
 - Updated to describe minor updates to the automation processes in the build for Vanguard 1.1
- Vanguard 1.0 Performance Specifications (1000813)
 - Updated to describe processing capabilities of Vanguard Flex to include the printing of full ballots for Vanguard 1.1.
- User Documentation (all)
 - All User documentation is revised to describe Vanguard 1.1 and to support the changes described in this document.

1.1.4 Initial Assessment of Impact of the Modifications

Review of the modifications listed in section “1.1.3 Modifications implemented into Vanguard 1.1”, indicates the need for limited Physical and Functional Configuration Audits to verify that the system continues to meet VVSG 2.0 requirements. All software, firmware and hardware modifications will be verified by execution of elections that incorporate steps to verify the modifications, or via test suites designed to specifically focus on the functional changes made to the applicable devices and applications.



1.1.5 Regression Testing

The limited FCA will consider functions that have not changed but may be impacted by the modifications. Each modified component of the system will require a new build. This will be subjected to FCA review at an appropriate level of scrutiny.

All modified components of **Verity Vanguard 1.1** will be regression tested in order to verify continued compliance to VVSG 2.0. Additionally, end-to-end system level elections will be performed to verify proper system operation.

1.2 References

The following key documents were used in preparing this test plan.

1. Election Assistance Commission Voluntary Voting System Guidelines 2.0 (EAC VVSG 2.0),
2. NIST Handbook 150: 2020
3. NIST Handbook 150-22: 2021
4. EAC Voting System Testing and Certification Program Manual, United States Election Assistance Commission, v 3.0
5. SLI Compliance VSTL Quality System Manual, Rev 4.4, July 21, 2025

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.
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.
Central Count Scanner	CCS	A mark sense-based ballot and vote counting device typically located at a central count facility and has 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



Term	Abbreviation	Description
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 lay out 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 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.).
Precinct Count Optical Scanner	PCOS	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 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.



Term	Abbreviation	Description
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 Testing Responsibilities

The following project schedule contains owner assignments and identifies test procedure (module) development, test case (suite) development, 3rd party tests, and EAC and Manufacturer dependencies.

1.4.1 Project Schedule

The subsections below describe the project schedule.

1.4.1.1 Project Timeline

The following schedule outlines the expected timeline for this project

Task Name	Start	Finish
Review - Source Code (EAC)	10/27/25	10/31/25
Trusted Build	11/3/25	Wed 11/7/25
Test Readiness Review (PenTest, TRR)	11/10/25	Thurs 11/20/25
Initiation of EAC Certification Project	11/21/25	Wed 11/21/25
Project Initiation	11/21/25	Wed 11/21/25
TDP Deliver/Receive Vendor Package	11/21/25	11/21/25
FCA Assessment	11/21/25	11/21/25
Test Plan Development	11/21/25	1/29/26
Preparation	11/21/25	1/29/26
Test Suite Development	11/21/25	1/29/26
Vendor Specific Module and Suite Creation/Validation	11/21/25	1/29/26
Modifications	1/14/26	1/29/26
Regression Testing	1/14/26	1/29/26
TDP Review	1/14/26	1/29/26
Official Execution	1/14/26	1/16/26
Execute Test Suites	1/29/26	2/3/26
Final Documentation Updates	2/3/26	2/3/26
Certification Test Report to EAC	2/3/26	2/3/26
Delivery of Artifacts to EAC Repository	2/9/26	2/9/26



1.4.1.2 Owner Assignments

Test Manager M. Santos is responsible for oversight and approvals for this test campaign. Work is conducted by SLI's trained and authorized Test Engineers.

- System Analysis and Review will be conducted by Source Code Review, Security and Voting Test Engineers, with oversight by the Test Manager.
- Source code review will be conducted by Voting Test Engineers (Source Code Review Specialists), with oversight by the Test Manager.
- Documentation review will be conducted by Security and Voting Test Engineers, with oversight by the Test Manager.
- Test Module Development will be conducted by Security and Voting Test Engineers, with oversight by the Test Manager.
- Test Suite Development will be conducted by Security and Voting Test Engineers, with oversight by the Test Manager.
- Formal Test Execution will be conducted by Security and Voting Test Engineers, with oversight by the Test Manager.

1.4.1.3 Test Module Development

Test Modules will be developed and/or modified to provide repeatable detailed test steps. The Modules are defined at a basic level in SLI Compliance's formal Test Methods and are designed for use in any suite that employs their functionality. This reusability reduces the development time associated with creating Modules.

The Modules will be validated prior to formal test execution to ensure accurate testing of the voting system.

Additionally, the Test Modules will provide traceability to SLI Compliance's formal Test Methods, as well as the VVSG 2.0 requirements.

1.4.1.4 Test Suite Development

Test suites will be developed to help group and focus testing around key areas of the voting system. The test suites will contain multiple test modules providing clear and traceable test scripts and key information. As needed for the system under test, various configurations will be identified within the suites. Potentially, variations of the same suite may be run multiple times in order to verify different configurations.

1.4.1.5 Trusted Build

A Trusted Build was performed, producing software and firmware components for all system components of **Verity Vanguard 1.1**. in order to include modifications made to those applications or to increment the version number to v1.1 when no modifications were made to those applications.



1.4.1.6 Formal Test Execution

Formal execution of the approved test suites and modules will be conducted to verify the system's compliance with the VVSG requirements.

1.4.1.7 3rd Party Hardware Testing

No hardware testing will be conducted in this test campaign.

1.4.1.8 EAC & Manufacturer Dependencies

The Test Plan will require EAC approval prior to finalization.

Hart will be required to provide all source code, documentation, equipment and supporting materials identified as part of the voting system.

The source code must have all discrepancies resolved, be successfully built and the outputs installed, and the components must pass operational status checks prior to formal test execution.

In addition, **Hart** is required to provide training on the voting system and support throughout the life of the project.

1.5 Scope of Testing

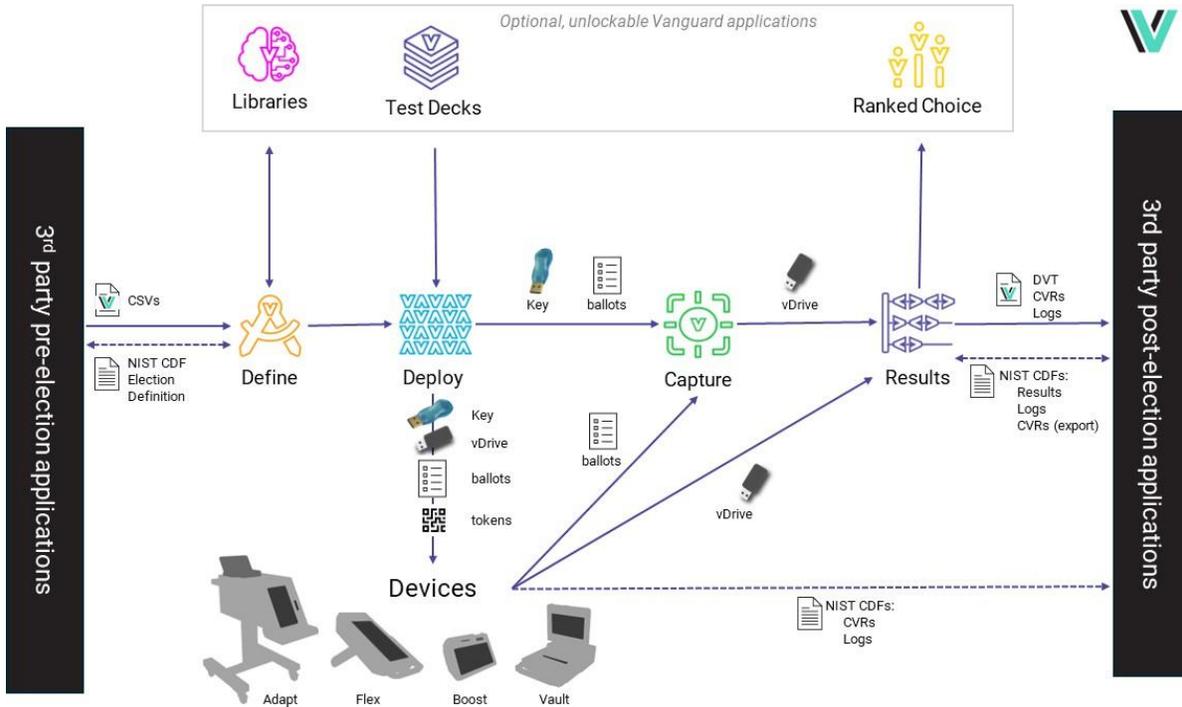
1.5.1 EAC Interpretations - RFI

This Certification Test Plan and the execution of tests for the voting system identified in this plan do not include any additional EAC interpretations

1.5.2 EAC Notices of Clarification - NOC

This Certification Test Plan and the execution of tests for the voting system identified in this plan do not include any additional EAC Notices of Clarification (NOC).

1.5.3 System Diagram



Overview of the diagram:

- The components are displayed as touch points of data access, transfers, and verification.
- Dotted lines show the flow of data and air gaps using vDrives.

2 PRE-CERTIFICATION TESTING AND ISSUES

2.1 Evaluation of prior VSTL testing

Prior VSTL testing has been performed on predecessor versions of the **Hart Verity Vanguard 1.1** voting system. The **Verity Vanguard 1.0** release, which was VSTL tested and EAC certified, constitutes the code base utilized for the **Verity Vanguard 1.1** release.

2.2 Evaluation of prior non-VSTL testing

No prior state or non-VSTL lab testing has been performed on the **Verity Vanguard 1.1** voting system.



2.3 Known Field Issues

Review of the “Known Vulnerabilities” database, maintained by SLI Compliance, has provided no known vulnerabilities that relate to the modifications implemented in **Verity Vanguard 1.1**.

3 MATERIALS REQUIRED FOR TESTING

Any materials used in an election cycle must be provided to SLI Compliance to facilitate testing of the voting system. This section outlines these materials that are required.

3.1 Software/Firmware

All software and firmware used by the declared **Verity Vanguard 1.1** voting system, whether directly or indirectly, in a production environment must be validated during the certification process.

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

3.1.1 Verity Vanguard 1.1 Components

Please see “Appendix B – Verity Vanguard 1.1 System Components” for detailed description of each system component.

3.1.2 COTS Software/Firmware

This section details the Commercial Off The Shelf software and firmware utilized within the **Verity Vanguard 1.1** voting system

Table 2 – Verity Vanguard 1.1 COTS Software/Firmware

Workstations (Define/Deploy, Capture, Results)		
Manufacturer	Application	Version
Microsoft	Windows 10 Enterprise 2021 LTSC, configured for kiosk operation	10.0.19044
Microsoft	SSRS - SQL Server Standard 2019	15.0.8270.42049
Microsoft	SQL Server Standard 2019	15.0.4316.3
McAfee	McAfee Application Control for Devices ("Solidifier")	8.3.5.126
Maxim	1-Wire Driver	4.1.0
Open Source	OWdotNET	0.9.0.0



Microsoft	Visual Studio C++ 2015-2022 Redistributable x86	14.36.32532.0
Microsoft	Visual Studio C++ 2015-2022 Redistributable x64	14.36.32532.0
Open Source	Tesseract Open Source OCR Engine	4.5.2.411
Brother	Brother HL-L6400DWVS Printer Driver	1.8.168.8
HP	HP LaserJet Pro 4001 4002 4002 4004 PCL 6	8.00.2101.9302
OKI Data	OKI C844 (PCL)	1.0.0.0
Canon	DR-G2000 Series Driver	1.1.11807.24001SP2
NVIDIA	NVIDIA Quadro P400 Driver	31.0.15.2748
NVIDIA	Z4G4 NVIDIA HD Audio Driver	1.3.39.16
Intel	Z2G9 Intel Graphics	31.0.101.4502
Microsoft	Help Viewer	2.3.28307
Microsoft	Visual Studio C++2013 Redistributable x64	12.0.30501.0
Microsoft	Visual Studio C++2013 Redistributable x86	12.0.30501.0
IntoPrint	SP1360(PCL6) Driver	1.0.0.0
empira Software GmbH	PDFSharp	1.50.5147.0
Open Source	Automapper	2.2.0.0
Open Source	MVVMLight	4.0.23.37706
Neodynamic ARL	Barcode Professional	11.0.23.223
Intel	Integrated Performance Primitives	2021.5.3.585
Open Source	NAudio	1.7.3.0
Open Source	NHibernate	3.3.1.4000
Prism Software,LLC	Prism	4.1.0.0
Open Source	SoundTouch	1.7.1.0
Microsoft	Unity	2.1.505.2
Open Source	OTP-Sharp	1.0.0
Open Source	Zxing.NET	0.16.4.0
Websupergoo	ABCpdf	12.3.0.0
Microsoft	Devcon	6.1.7600.16385
Telerik	UI for WPF	2025.1.211.462
Telerik	Reporting	18.1.24.709
Okidata	OKIWinIO	1.8.2.2
Open Source	Math.NET Numerics	2.6.1.30
Open Source	Zxcvbn C#/.NET	7.0.92
Microsoft	.NET Framework Runtime	4.8.1



Devices (Vault, Flex, Adapt, Boost)		
Manufacturer	Application	Version
Microsoft	Windows 10 Enterprise 2021 LTSC, configured for kiosk operation	10.0.19044
Microsoft	SQLite	3.45.3
McAfee	McAfee Application Control for Devices ("Solidifier")	8.3.5.126
Maxim	1-Wire Driver	4.1.0
Open Source	OWdotNET	0.9.0.0
Microsoft	Visual Studio C++ 2015-2022 Redistributable x86	14.36.32532.0
Microsoft	Visual Studio C++ 2015-2022 Redistributable x64	14.36.32532.0
Seiko Instruments	SII IFD50x Driver	2.5.0.0
Open Source	Tesseract Open Source OCR Engine	4.5.2.411
Brother	Brother HL-L6400DWVS Printer Driver	1.8.168.8
PDI	PageScan Scanner SDK	7.2.17
PDI	PageScan USB Scanner Driver	4.0.0301.13
PDI	PDIPrintScanCut Driver for TPH850 Printer	4.1.0.0
HP	HP LaserJet Pro 4001 4002 4002 4004 PCL 6	8.00.2101.9302
HP	HP OfficeJet 200 Mobile Series	20.79.1.6738
OKI Data	OKI C844 (PCL)	1.0.0.0
empira Software GmbH	PDFSharp	1.50.5147.0
Open Source	Automapper	2.2.0.0
Open Source	MVVMLight	4.0.23.37706
Neodynamic ARL	Barcode Professional	11.0.23.223
Intel	Integrated Performance Primitives	2021.5.3.585
Open Source	Math.NET Numerics	2.6.1.30
Open Source	NAudio	1.7.3.0
Open Source	NHibernate	3.3.1.4000
Prism Software, LLC	Prism	4.1.0.0
Open Source	SoundTouch	1.7.1.0
Microsoft	Unity	2.1.505.2
Open Source	OTP-Sharp	1.0.0
Open Source	Zxing.NET	0.16.4.0
Open Source	Zxcvbn C#/.NET	7.0.92
Brother	brUSBMon Printer Interface, x64	1.0.0.0
Brother	brUSBMon Printer Interface, x86	1.0.1.0
Microsoft	Devcon	6.1.7600.16385
Telerik	Reporting	18.1.24.709



Microsoft	.NET Framework Runtime	4.8.1
Microsoft	Brother Ports Driver	01.02.00.00
SECO	Chipset Device	10.1.19222.8341
SECO	CSME_SW_2306.4.10.0_Consumer	2306.4.10.0
Intel	Intel Graphics Driver	31.0.101.2115
SECO	HID Event Filter	2.2.2.1
SECO	Programmable Services Engine Windows Drivers	1.0.10099.968
SECO	Serial IO	5.123.1.1025
SECO	Smart Sound Technology	10.30.00.7090
Okidata	OKIWinIO	1.8.2.2

3.1.3 Additional Supporting Test Software

This section outlines all test specific software that will be used in the test campaign.

Table 3 – Additional Supporting Test Software

Manufacturer	Application
CLOC	<u>Count Lines of Code</u> : an open source application used to determine the counts of executable and comment lines.
SLI Compliance	<u>Module Finder</u> : an SLI Compliance proprietary application used to parse module names from source code.
CheckMarx	CheckMarx is an integrated development environment (IDE) that enables static code analysis.

3.2 Equipment

The following equipment is required for the execution of the hardware, software, telecommunications, and security tests. This includes system hardware, general purpose data processing and communications equipment, and any test instrumentation required.

3.2.1 Verity Vanguard 1.1 Equipment

Please see “Appendix B – Verity Vanguard 1.1 System Components” for detailed description of each system component’s associated equipment.



3.3 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, test ballot cards and control cards, standard and optional output data report formats, and any other materials used in testing.

- Ballots & blank ballot grade paper
- Thumb drives
- USB dongle
- Ballot marking pens
- Printer paper rolls

3.4 Deliverable Documents

See “Appendix A – TDP Listing”, for documents to be delivered as a part of the Hart Verity Vanguard 1.1 system.

4 TEST SPECIFICATIONS

The following are the specifications for testing to be conducted on the **Hart Verity Vanguard 1.1** system. The specifications contain details on the focus of testing, configuration(s), and the functions to be tested.

4.1 Requirements

The **Verity Vanguard 1.1** modified voting system will be tested to requirements as listed below:

4.1.1 Mapping of Modification to Requirements and Components

This section details implemented modifications, pertinent requirements and components.

Modification	Requirement(s)	Component
Updated Privacy Screens – Flex now supports a new privacy screen configuration to physically block the onboard thermal ballot printer to avoid voter confusion when used with the full ballot configuration.	6.1-A – Preserving privacy for voters	Flex BMD



.Modification	Requirement(s)	Component
Support for printing a full ballot from Flex with an external COTS printer – Driven by a distinct software load with no change to device hardware, Flex can now be paired with a COTS printer (HP LaserJet Pro 4001dn) to print a full ballot.	3.1.2-D – Processing capabilities 4.3-A – Standard device interfaces 4.4-A – COTS devices meet applicable requirements 12.1-A – Unauthorized physical access 12.1-B – Unauthorized physical access alert 12.1-C – Disconnecting a physical device 12.1-D – Logging of physical connections and disconnections 12.2-A – Physical port and access least functionality 12.2-B – Physical port auto-disable 12.2-D – Disabling ports 12.2-E – Logging enabled and disabled ports 15.1-D – Logging event types	Flex BMD Vault PCOS Capture CCS (Note that Vault and Capture will be used to verify that ballots can be read and tabulated)
Updated configuration control – Vanguard now supports the ability to define the ballot marking configuration. In “Manage” users can select “Paper Ballot”, “Printed Vote Records”, or “Paper Ballots and Printed Vote Records” as the configuration type. When only “Paper Ballot” is selected, Define and Deploy hide unrelated “PVR” only fields for data entry.	3.1.2-D – Processing capabilities	Define EMS Deploy EMS Adapt BMD Flex BMD Vault PCOS Capture CCS
Vanguard ID indicator update – Vanguard ID includes an onscreen indicator on Flex for at-a-glance verification of the configured ballot type. The Vanguard ID screen will indicate “PVR” for summary ballots and “Paper” for full ballots.	3.1.2-D – Processing capabilities	Flex BMD
New Supported COTS Equipment		
Support for the DJI brand Power 1000 UPS. This UPS may be used on the Vanguard workstations or with an external printer attached to the Flex and Boost. This UPS is included in the modification as the existing Duracell DR660PSS model is end of life.	3.1.2-D – Processing capabilities 2.7-H – Power outages, sags, and swells	Define EMS Deploy EMS Boost PPBI Flex BMD Capture CCS Results EMS



Modification	Requirement(s)	Component
Support for a new workstation monitor model, the HP 324pf for use on all Vanguard workstations deployments. This monitor is included in the modification as the HP P24 G5 model is end of life.	3.1.2-D – Processing capabilities	Define EMS Deploy EMS Capture CCS Results EMS
Other Updates		
Telerik UI for WPF, a third-party library used on workstation applications for UI development, is updated from 2023.2.606.45 to 2025.1.211.462.	3.1.2-D – Processing capabilities 2.3-B – Legacy library units 3.1.1-D – Identify software and firmware by origin 3.1.4-B – Software information	Define EMS Deploy EMS Capture CCS Results EMS
A second supported paper option is added for the Adapt device, Hammermill Premium Color Copy paper (102467)	2.1.1-C – Durability of paper 3.1.6-M – Ballot stock specification	Adapt BMD
Defect Corrections		
Unclear Warning Message for Cross-Party Endorsement Functionality	3.1.2-D – Processing capabilities 7.3-A – System-related errors	Adapt BMD
Contextual Help Screen when Create Recovery vDrive is completed mentions “Count”	3.1.2-D – Processing capabilities	Boost PPBI Adapt BMD Flex BMD Vault PCOS
Next Unresolved button used for locating unresolved write-ins may not display the next sequential record	3.1.2-D – Processing capabilities	Capture CCS
The Brother HL-L6400DWVS printer prints reports in Duplex by default (flip on long edge), inconsistent with other printers that print reports in Simplex	3.1.2-D – Processing capabilities	Results EMS
A Closed Primary Entity Election may be successfully created via CSV data import when when the “AllowNonPartisanVotingOnThis Contest” value is set to true	3.1.2-D – Processing capabilities 7.3-A – System-related errors	Define EMS



4.2 Software System Functions

4.2.1 Software Functional Test Design and Data

SLI Compliance will prepare functional test modules using the operator/user procedures specified in the TDP. Functionality provided by the **Verity Vanguard 1.1** voting system is exercised in order to verify that each functional component performs as expected. Accept/reject criteria are based on requirements of the VVSG and the system specification documents provided within the TDP.

The following test suites will be utilized in the testing of **Verity Vanguard 1.1**:

General Election – The full **Verity Vanguard 1.1** voting system will be reviewed in order to verify proper integration of the voting system and that all components continue to work as expected.

Modifications – The modifications to each component and software application will be given focused testing in order to verify that the modifications implemented do not adversely affect operations. Elections will be designed and utilized, in some instances repeated.

Security – A security review of the system will be performed to ensure no new security threat has been introduced, given the introduction of an external printer to the Flex BMD..

4.3 TDP Evaluation

SLI Compliance is completing an assessment of the deliveries in the Technical Data Package for **Verity Vanguard 1.1** against the **Verity Vanguard 1.0** TDP. Any modifications to previously reviewed documentation will be evaluated.

SLI Compliance will conduct a PCA review of all new or modified vendor traced documents submitted for review in the delivery of the **Verity Vanguard 1.1** TDP. Documents are verified for compliance to VVSG 2.0.

Any subsequent re-deliveries of the TDP items will be solely the result of fixes to discrepancies identified in the remaining FCA or PCA activities.

4.4 Source Code Review

The certification campaign for the **Hart Verity Vanguard 1.1** voting system includes modified software and firmware that have been created as proprietary to **Hart**, as well as review of any commercial off the shelf products. SLI Compliance has conducted a source code review of all modified proprietary source code, and modified COTS products, submitted in the delivery of the voting system TDP for compliance to the EAC VVSG v 2.0.



The coding languages involved in the vendor's applications include:

- C
- C++
- C#

Source code review Tools utilized by SLI Compliance include:

- LocMetrics Line Counter: a commercial application used to determine the counts of executable and comment lines.
- Module Finder: an SLI Compliance proprietary application used to parse module names from C/C++ and VB code and populate the identified module names into the review documents.
- CheckMarks: a customizable integrated development environment used for static code analysis.

Any subsequent re-reviews of source code will be the result of fixes to discrepancies identified in the FCA activities.

COTS operating systems and software used in the voting system have been verified as authentic and unmodified in the **Verity Vanguard 1.1** test campaign

4.5 Trusted Build

The Trusted Build process for **Hart Verity Vanguard 1.1** was devised to allow for the build to be performed by and under the supervision of an SLI Compliance Voting System Test Engineer, to preserve the security of the Hart Trusted Build process, and to maintain SLI Compliance's chain of custody. The steps for this process included the following:

- Preparation for the Trusted Build – Obtaining and reviewing Hart's procedure for constructing the build platform, verifying the target build platform, and verifying the proper contents of the source code package were extracted to the target build platform via hash codes.
- Execution of the Trusted Build – SLI Compliance performed the Trusted Build by using the step-by-step build procedure, as provided by Hart to create a pristine build environment. SLI Compliance observed the following items throughout the build process:
 - Build environment images at various key points
 - Build environment and file hashes at various key points
 - Build environment hardware characteristics
 - Build results from code compilation and file hashes
 - Final software install files and file hashes
 - Build virtual machine files
- Deliverables to Testing – Upon completion of the Trusted Build, the product installs were created and installed on equipment at Hart's facility. Each device had a unique serialized security seal applied that



was verified by SLI Compliance upon receipt. In addition, certain items were sent to the SLI Compliance test group:

- Final software install files
 - Workstation base OS images
 - Workstation product images
 - Build output hash values to validate install files
 - Workstation and device hash files
 - Tamper seal application evidence
 - Build server artifacts
-
- Final Record Keeping and Archiving Procedures – At the conclusion of the Trusted Build process, SLI Compliance completed all final record keeping and archiving procedures at SLI Compliance’s facility. This record keeping includes any unique identifiers, results of the build with version numbers and dates, and descriptions of all hashes and images in the repository. Hash files of the build outputs were verified against the hash files obtained from the devices to ensure the contents of the installed images. Tamper seals codes were verified and confirmed to be intact

4.6 Standard VSTL Test Methods and Uncertainty of Test Data Measurement

This test campaign utilizes Standard VSTL test methods and nominal type test data only.

5 TEST DATA

Test data for the **Hart Verity Vanguard 1.1** voting system will be compiled such that all functionality declared will be tested to determine conformance to the standards.

5.1 Data Recording

SLI Compliance will evaluate the modified system functionality, as described by **Hart** technical documentation, as well as requirements as listed in the EAC VVSG v2.0, and make determinations as to expected results of all data inputs into the **Hart Verity Vanguard 1.1** voting system. This includes:

- Election type
- Precincts of all types
- Districts
- Offices



- Contests
- Candidates
- Parties
- Devices used
- Voting variations employed
- Issues/Referendums
- Votes cast for each candidate/issue/referendum
- Vote consolidation data from one device/level to the next

The data is contained in one master data record, including each input and expected output. This data is incorporated into the appropriate test suite, populating test modules with exact expected data for the function being tested.

Testing information is recorded in the test suites and test , which are utilized according to SLI Compliance's relevant standard lab procedures.

6 TEST PROCEDURE AND CONDITIONS

This section describes the test conditions and procedures for execution of test suites. If a particular sequence is mandatory for the execution of suites, a rationale will be given. Additionally, this section is used to describe procedures for setting up equipment to be used in the test suite execution.

6.1 Facility Requirements

Testing will be performed on site at SLI Compliance in Colorado.

Secure labs are available with appropriate power supply and space to accommodate the various configurations defined within this test plan. Temperature/humidity gauges will be employed to determine whether the appropriate conditions exist during testing.

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

- Temperature: 64°F - 79°F (17.7°C - 26.1°C)
- Relative Humidity: 20 to 90%
- Atmospheric Pressure: Local Site Pressure

All TDP and test documentation is stored on site at SLI Compliance's facility in a secure project directory on SLI Compliance's secure Voting server.



6.2 Test Setup

Configurations of **Verity Vanguard 1.1** will be deployed that conform to each specific test suite's needs. In all instances **Verity Vanguard 1.1** documentation will be followed in the setup of the configurations.

6.3 Test Sequence

While there is no required sequence for performing voting system certification testing and audits, there are prerequisite tasks for some testing. Tasks and any applicable predecessor tasks are identified within each suite for the test cases.

6.4 Test Operations Procedures

An inventory has been performed to verify the voting equipment received contains hardware and software elements as defined in the TDP prior to commencement of testing.

Throughout the testing effort, test suites and modules will be marked as follows:

- **Accept** – Test is accepted as successful.
- **Reject** – Test is rejected as unsuccessful.
- **NT** – Not Testable is used for test modules that cannot be completed. For example, if failure of one test module failure precludes attempting subsequent test modules, the latter will be marked as NT.

Test results **Reject** and **NT** will include comments by the test engineer explaining the reason for the result.

Issues encountered during review and testing will be documented on the Discrepancy Report. Test findings showing that an aspect of the voting system does not conform to the requirements of the identified test standard will be marked as Documentation Discrepancies, Source Code Review Discrepancies, Hardware Discrepancies, or Functional Discrepancies.

Issues that are encountered during testing or documentation review but are not addressed by the applicable standard will be added to the Discrepancy Report and noted as Informational. The vendor has the option whether to address Informational issues. All responses provided by the vendor are noted in the Discrepancy Report attachment to the Voting System Test Report.



7 Approval Signature

Michael Santos

Michael Santos
Director – VSTL,
SLI Compliance
December 16th, 2025



8 Appendix A – TDP Listing

- 4007010 Flex Hardware Pack.pdf
- 4007020 Boost Hardware Pack.pdf
- 4007030 Vault Hardware Pack.pdf
- 4007040 Adapt Hardware Pack.pdf
- 4007050 Imprinter Hardware Pack.pdf
- 4007060 Ballot Box Hardware Pack.pdf
- 4007061 Booth Hardware Pack.pdf
- 4007062 Accessible Booth Hardware Pack.pdf
- 6700-002 A02_Vanguard_1.1_System Administrators Guide.pdf
- 6710-008 A01_Vanguard_1.1_Define User Guide.pdf
- 6710-009 A01_Vanguard_1.1_Deploy User Guide.pdf
- 6710-010 A01_Vanguard_1.1_Capture User Guide.pdf
- 6710-011 A01_Vanguard_1.1_Results User Guide.pdf
- 6710-012 A00_Vanguard_1.1_Test Decks User Guide.pdf
- 6710-013 A00_Vanguard_1.1_Libraries User Guide.pdf
- 6710-014 A00_Vanguard_1.1_Ranked Choice User Guide.pdf
- 6720-006 A00_Vanguard_1.1_Boost Polling Place Guide.pdf
- 6720-007 A00_Vanguard_1.1_Adapt Polling Place Guide.pdf
- 6720-008 A00_Vanguard_1.1_Flex Polling Place Guide.pdf
- 6720-009 A00_Vanguard_1.1_Flex Polling Place Guide - Full Ballot.pdf
- 6720-010 A00_Vanguard_1.1_Vault Polling Place Guide.pdf
- 6720-011 A01_Vanguard_1.1_Vault Polling Place Guide w Imprinter.pdf
- 6730-006 A01_Vanguard_1.1_Boost Device Support Guide.pdf
- 6730-007 A01_Vanguard_1.1_Adapt Device Support Guide.pdf
- 6730-008 A01_Vanguard_1.1_Flex Device Support Guide.pdf
- 6730-009 A01_Vanguard_1.1_Flex Device Support Guide - Full Ballot.pdf
- 6730-010 A01_Vanguard_1.1_Vault Device Support Guide.pdf
- 6730-011 A02_Vanguard_1.1_Vault Device Support Guide w Imprinter.pdf
- 6740-001 C_Vanguard_Ballot Printing Guide.pdf
- Change Notes Verity Vanguard 1.0 to 1.1 1000834 A00.pdf
- Hart Verity Vanguard Election Worker Usability Test Report 1000818 A00.pdf
- Hart Verity Vanguard Voter Usability Test Report 1000819 v1.1.pdf
- HartLogo.jpg
- REP082794TRFSAF[VV-500, Boost].pdf
- REP082796TRFSAF[VV-400, Flex].pdf
- REP082798TRFSAF[VV-600, Vault].pdf
- REP090127TRFSAF[VV-700, Adapt].pdf
- System Overview Attachment, Benchmark Directory Listings.zip
- Vanguard 1.0 - QA Test Cases and Results 1000821 A02.pdf
- Vanguard 1.0 VVSG 2.0 and Ext Test Case Mapping.pdf
- Vanguard 1.1 System Overview 1000812 B03.pdf



- Vanguard CDF Specification 1000803 A02.pdf
- Vanguard Creation of the Trusted Build Environment 1000811 B01.pdf
- Vanguard Device Deployment Process 1000824 A01.pdf
- Vanguard Durability Estimation and Warranty Model 1000820 A01.pdf
- Vanguard Event Code Specification 1000804 A03.pdf
- Vanguard Hart Formats Specification 1000805 A00.pdf
- Vanguard Manual Application Hash Validation 1000828 A02.pdf
- Vanguard MCUs Build and Flash Procedure 1000822 A00.pdf
- Vanguard Paper Specifications 1000802 A03.pdf
- Vanguard Quality Conformance Procedures 1000806 A01.pdf
- Vanguard Risk and Threat Assessment 1000799 A02.pdf
- Vanguard Supply Chain Risk Management 1000823 A01.pdf
- Vanguard User-centered Design Report 1000817 A00.pdf
- Vanguard Vulnerability Management Plan 1000807 A00.pdf
- Vanguard Win10 Baseline Security 1000815 A02.pdf
- Vanguard Workstation Deployment Process 1000808 A05.pdf
- Vanguard-1.1.0_08_09_2025.pdf
- Verity Vanguard 1.1 Device OS Creation & Configuration 1000810 B00.pdf
- Verity Vanguard 1.1 Implementation Statement 1000833 A01.pdf
- Verity Vanguard 1.1 Performance Specifications 1000813 B00.pdf
- Verity Vanguard 1.1 Usability Impact Statement.pdf
- Verity Vanguard 1.1 Workstation OS Creation & Configuration 1000809 B00.pdf
- Verity Vanguard Coding Standard 1000826 A01.pdf
- Verity Vanguard Software Architecture and Design Overview 1000796 A01.pdf
- VV110_DeviceSoftwareInfo.pdf
- VV110_WorkstationSoftwareInfo.pdf
- VVanguard_Small.png
- _TDPindex.html



9 Appendix B – Verity Vanguard 1.1 Components

The **Hart Verity Vanguard 1.1** voting system consists of the following software and firmware components:

Table 4 – Verity Vanguard 1.1 Components

Component	Software Version	Component Type	High Level Functions and Capabilities
Manage	1.1.0	Workstation Software	<ul style="list-style-type: none"> • Verity Vanguard Workspace Module • Import, export, archive, restore, manage elections • Runs on the following COTS workstations and monitors: <ul style="list-style-type: none"> ○ HP Z2 SFF G9 workstation ○ HP Z4 G4 workstation ○ 324pf, P24 G5, P24 G4, P244 monitors • Compatible with the following COTS UPS devices: <ul style="list-style-type: none"> ○ Duracell DR660PSS ○ EATON 5P1500 ○ DJI Power 1000
Define	1.1.0	Workstation Software	<ul style="list-style-type: none"> • Verity Vanguard Workspace Module • Included in the same Workspace as Deploy • Enter data associated with jurisdictions, polling places, contests, candidates, proposition text, etc. • Ballot Design • Create election-specific audio • Enter translations • Lock the election data • Runs on the following COTS workstations and monitors: <ul style="list-style-type: none"> ○ HP Z2 SFF G9 workstation ○ HP Z4 G4 workstation ○ 324pf, P24 G5, P24 G4, P244 monitors • Compatible with the following COTS printers: <ul style="list-style-type: none"> ○ Brother HL-L6400DW series mono laser printer ○ Brother HL-EX415DW series mono laser printer ○ HP LaserJet Pro 4001dn series



Component	Software Version	Component Type	High Level Functions and Capabilities
			<p style="text-align: center;">mono laser printer</p> <ul style="list-style-type: none"> • Supports local networked configuration for scale, compatible with the following COTS Ethernet switches: <ul style="list-style-type: none"> ○ HP 1405-8GV3 8-port Ethernet Switch ○ HPE R8R45A 8-port Ethernet Switch • Compatible with the following COTS UPS devices: <ul style="list-style-type: none"> ○ Duracell DR660PSS ○ EATON 5P1500 ○ DJI Power 1000
Deploy	1.1.0	Workstation Software	<ul style="list-style-type: none"> • Verity Vanguard Workspace Module • Included in the same Workspace as Define • Ballot definition and proofing • Set voting device options • Production for ballots and electronic election media • Runs on the following COTS workstations and monitors: <ul style="list-style-type: none"> ○ HP Z2 SFF G9 workstation ○ HP Z4 G4 workstation ○ 324pf, P24 G5, P24 G4, P244 monitors • Compatible with the following COTS printers: <ul style="list-style-type: none"> ○ Brother HL-L6400DW series mono laser printer ○ Brother HL-EX415DW series mono laser printer ○ HP LaserJet Pro 4001dn series mono laser printer ○ OKI Data C831dn color laser printer ○ OKI Data C844dn color laser printer ○ OKI Data C911dn color laser printer ○ OKI Data C931e color laser printer ○ IntoPrint SP1360 color laser printer • Supports local networked configuration for scale, compatible with the following COTS Ethernet switches: <ul style="list-style-type: none"> ○ HP 1405-8GV3 8-port Ethernet



Component	Software Version	Component Type	High Level Functions and Capabilities
			<ul style="list-style-type: none"> Switch <ul style="list-style-type: none"> ○ HPE R8R45A 8-port Ethernet Switch • Compatible with the following COTS UPS devices: <ul style="list-style-type: none"> ○ Duracell DR660PSS ○ EATON 5P1500 ○ DJI Power 1000 • Compatible with the following USB Duplicators <ul style="list-style-type: none"> ○ VinPower Digital 23 target USBDupeBoxES-23T, USBShark-23TBK ○ VinPower Digital 7 target USBShark-7T-BK
Capture	1.1.0	Workstation Software	<ul style="list-style-type: none"> • Verity Vanguard Workspace Module • Central scanning • Adjudication • Runs on the following COTS workstations and monitors: <ul style="list-style-type: none"> ○ HP Z2 SFF G9 workstation ○ HP Z4 G4 workstation ○ 324pf, P24 G5, P24 G4, P244 monitors • Compatible with the following COTS printers: <ul style="list-style-type: none"> ○ Brother HL-L6400DW series mono laser printer ○ Brother HL-EX415DW series mono laser printer ○ HP LaserJet Pro 4001dn series mono laser printer • Compatible with the following COTS scanners <ul style="list-style-type: none"> ○ Canon DR-G2110 High-Speed scanner ○ Canon DR-G2140 High-Speed scanner • Supports local networked configuration for scale, compatible with the following COTS Ethernet switches: <ul style="list-style-type: none"> ○ HP 1405-8GV3 8-port Ethernet



Component	Software Version	Component Type	High Level Functions and Capabilities
			<ul style="list-style-type: none"> Switch <ul style="list-style-type: none"> ○ HPE R8R45A 8-port Ethernet Switch • Compatible with the following COTS UPS devices: <ul style="list-style-type: none"> ○ Duracell DR660PSS ○ EATON 5P1500 ○ DJI Power 1000
Results	1.1.0	Workstation Software	<ul style="list-style-type: none"> • Verity Vanguard Workspace Module • Vote tabulation • Election results reports • Election audit reports • Runs on the following COTS workstations and monitors: <ul style="list-style-type: none"> ○ HP Z2 SFF G9 workstation ○ HP Z4 G4 workstation ○ 324pf, P24 G5, P24 G4, P244 monitors • Compatible with the following COTS printers: <ul style="list-style-type: none"> ○ Brother HL-L6400DW series mono laser printer ○ Brother HL-EX415DW series mono laser printer ○ HP LaserJet Pro 4001dn series mono laser printer • Supports local networked configuration for scale, compatible with the following COTS Ethernet switches: <ul style="list-style-type: none"> ○ HP 1405-8GV3 8-port Ethernet Switch ○ HPE R8R45A 8-port Ethernet Switch • Compatible with the following COTS UPS devices: <ul style="list-style-type: none"> ○ Duracell DR660PSS ○ EATON 5P1500 ○ DJI Power 1000
Ranked Choice	1.1.0	Workstation Software	<ul style="list-style-type: none"> • Verity Vanguard Workspace Module • Optional unlockable application included in the same Workspace as Results • Round-by-round results and reporting



Component	Software Version	Component Type	High Level Functions and Capabilities
			<p>for ranked choice contests</p> <ul style="list-style-type: none"> • Runs on the following COTS workstations and monitors: <ul style="list-style-type: none"> ○ HP Z2 SFF G9 workstation ○ HP Z4 G4 workstation ○ 324pf, P24 G5, P24 G4, P244 monitors • Compatible with the following COTS printers: <ul style="list-style-type: none"> ○ Brother HL-L6400DW series mono laser printer ○ Brother HL-EX415DW series mono laser printer ○ HP LaserJet Pro 4001dn series mono laser printer • Compatible with the following COTS UPS devices: <ul style="list-style-type: none"> ○ Duracell DR660PSS ○ EATON 5P1500 ○ DJI Power 1000
Libraries	1.1.0	Workstation Software	<ul style="list-style-type: none"> • Verity Vanguard Workspace Module • Optional unlockable application included in the same Workspace as Define and Deploy. • Integrated text, translation, and audio recording archive for re-use between elections. • Runs on the following COTS workstations and monitors: <ul style="list-style-type: none"> ○ HP Z2 SFF G9 workstation ○ HP Z4 G4 workstation ○ 324pf, P24 G5, P24 G4, P244 monitors • Compatible with the following COTS UPS devices: <ul style="list-style-type: none"> ○ Duracell DR660PSS ○ EATON 5P1500 ○ DJI Power 1000



Component	Software Version	Component Type	High Level Functions and Capabilities
Test Decks	1.1.0	Workstation Software	<ul style="list-style-type: none"> • Verity Vanguard Workspace Module • Optional unlockable application included in the same Workspace as Define and Deploy. • Automated Test Deck Creation, supporting the following patterns “1 to max,” “Variable pattern,” and “Rotating pattern.” • Creates pre-marked test decks to streamline Logic and Accuracy Testing • Runs on the following COTS workstations and monitors: <ul style="list-style-type: none"> ○ HP Z2 SFF G9 workstation ○ HP Z4 G4 workstation ○ 324pf, P24 G5, P24 G4, P244 monitors • Compatible with the following COTS UPS devices: <ul style="list-style-type: none"> ○ Duracell DR660PSS ○ EATON 5P1500 ○ DJI Power 1000
Boost	1.1.0	Polling Place Device	<ul style="list-style-type: none"> • Multipurpose poll worker device for ballot issuance • Prints blank ballots on demand for hand-marked configurations • Prints VotePass self-service ballot activation tickets for use on Flex • Compatible with the following COTS printers: <ul style="list-style-type: none"> ○ Brother HL-L6400DW series mono laser printer ○ Brother HL-EX415DW series mono laser printer ○ HP LaserJet Pro 4001dn series mono laser printer ○ OKI Data C844dn color laser printer • Supports AutoBallot which is compatible with the following COTS barcode scanners: <ul style="list-style-type: none"> ○ Motorola/Zebra DS4308 handheld barcode scanner ○ Zebra Technologies DS4608 handheld barcode scanner



Component	Software Version	Component Type	High Level Functions and Capabilities
			<ul style="list-style-type: none"> • Compatible with the following COTS UPS devices: <ul style="list-style-type: none"> ○ Duracell DR660PSS ○ DJI Power 1000
Flex	PVR: 1.1.0 Full Ballot: 1.1.0	Polling Place Device	<ul style="list-style-type: none"> • Ballot Marking Device • Option 1: Unique software load to print on integrated thermal printer. <ul style="list-style-type: none"> ○ Prints full page, summary Printed Vote Record (PVR) ballots • Option 2: Unique software load to print on external laser thermal printer. <ul style="list-style-type: none"> ○ Prints full marked ballots ○ Compatible with the HP LaserJet Pro 4001dn series mono laser printer ○ Includes privacy screen to cover integrated thermal printer slot ○ Compatible with the following COTS UPS devices: <ul style="list-style-type: none"> ▪ Duracell DR660PSS ▪ DJI Power 1000 • AC Power Pass-through supports up to 6 Flex devices or a maximum load of 9A. • Activated by poll worker or by voting with a VotePass self- service ticket generated by a poll worker from a Boost device's integrated report printer • May sit atop a tabletop or on an optional purpose-built booth that's available in Standard or Accessible configurations. • Two deployment positions to support optimum viewing angle for standing or sitting voters • Supports AutoBallot which is compatible with the following COTS barcode scanners: <ul style="list-style-type: none"> ○ Motorola/Zebra DS4308 handheld barcode scanner ○ Zebra Technologies DS4608



Component	Software Version	Component Type	High Level Functions and Capabilities
			handheld barcode scanner <ul style="list-style-type: none"> • Supports the following full page framed magnifiers: <ul style="list-style-type: none"> ○ Bausch & Lomb 819007 ○ Inclusion Solutions 436
Vault	1.1.0	Polling Place Device	<ul style="list-style-type: none"> • Polling place scanner for hand marked ballots and PVR ballots generated from Flex • Sits atop a secure purpose-built collapsible Ballot Box • Scans hand marked, machine marked, and summary PVR ballots • Support for an optional purpose-built imprinter
Adapt	1.1.0	Polling Place Device	<ul style="list-style-type: none"> • All-in-one accessible voting device • Mark, verify, and cast paper ballots with a summary of a voter's choices • Integrated Ballot Bin • Utilizes the following COTS printer: <ul style="list-style-type: none"> ○ HP OfficeJet 200 inkjet printer • Supports AutoBallot which is compatible with the following COTS barcode scanners: <ul style="list-style-type: none"> ○ Motorola/Zebra DS4308 handheld barcode scanner ○ Zebra Technologies DS4608 handheld barcode scanner • Supports the following full page framed magnifiers: <ul style="list-style-type: none"> ○ Bausch & Lomb 819007 ○ Inclusion Solutions 436

End of Modification Test Plan
