



**Elections Division
Office of the Secretary of State**

**Report of the Secretary of State on the Examination
of HART Intercivic Verity 2.0 Voting System**

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Overview

Application

On May 9th HART InterCivic submitted an application for Washington State Certification of Verity 2.0. HART applied to certify the full functionality of all the Verity Voting System which includes Verity Data, Build, Central, Count, User Management, Election Management, Touch Writer, Scan, and Print. Copies of operating and maintenance manuals, training materials, technical and operational specifications were provided as part of the EAC's Technical Data Package.

New Voting System

This is a modification of a currently certified voting system (HART Verity 1.0) to the State of Washington. This system is paper based digital scan voting system with a commercial off the shelf (COTS) scanner.

This system is not yet certified or used in other states.

National Certification

After the completion of testing by a certified Voting System Test Lab (VSTL) the Election Assistance Commission (EAC) certified Verity 2.0 on April 27th, 2016. The following hardware and software of the system have been approved by the EAC:

Verity Data	2.0.2			Data management software
Verity Build	2.0.2			Election definition software
Verity Central	2.0.2			High speed digital scanning software
Verity Count	2.0.2			Tabulation and reporting software
Verity Scan	2.0.3			Digital scanning device
Verity Touch Writer	2.0.3			Accessible BMD device
Verity Controller	2.0.3			DRE polling place management console firmware
Verity Touch	2.0.3			DRE Firmware
Verity Touch with Access	2.0.3			DRE Firmware
Verity Print	2.0.3			On demand ballot printing device firmware
Verity Device Microcontroller	V17			Firmware for Verity devices
VerityWorkstation Operating System– Build, Central & Count	6.1.7601		Microsoft Operating System	Windows Embedded Standard 7 w/ service pack 1, 64 bit

Application control – Build, Central, Scan, Touch Writer, & Count	6.1.1.369		COTS: McAfee Application Control	Configured for Verity workstations and devices
Framework – Build, Central, Scan, Touch Writer, & Count	4.0.30319; 4.5.50709		COTS: Microsoft .NET 4.x Framework	Unmodified
Database – Build, Central & Count	11.0.2100		COTS: Microsoft SQL Server 2012	Unmodified
Runtime Libraries – Build, Central, Scan, Touch Writer, & Count	8.0.56336		COTS: Microsoft Visual Studio C++ 2005	Unmodified
Runtime Libraries – Build, Central, Scan, Touch Writer, & Count	10.0.40219		COTS: Microsoft Visual Studio C++ 2010	Unmodified
Verity Device Operating System – Scan, Touch Writer	6.1.7601		Microsoft Operating System	Windows Embedded Standard 7 w/ service pack 1, 32 bit
Database –Print, Scan, Touch Writer, Controller, Touch, Touch with Access	11.0.2100		COTS: Microsoft SQL Server Express	Unmodified
Verity Scan		Revision C		
Verity Touch Writer		Revision C		
Verity Print		Revision B		
Verity Controller		Revision B		
Verity Scan		Revision B		
Verity Touch		Revision B		
Verity Touch with Access		Revision B		
Verity Key		N/A	COTS: Maxim iButton	Security key used with voting system
Verity vDrive		N/A	COTS: Apacer	4GB USB flash drive, portable electronic media used for transportation of voting system data
Ballot/Report Printer - Build, Central, Touch Writer, & Count		B431d	COTS: Okidata	
Ballot Printer - Build		C911	COTS: Okidata	
Ballot Printer - Build		C831	COTS: Okidata	
Scanner - Central		i5600	COTS: Kodak	
Scanner - Central		DR-G1100	COTS: Canon	
Scanner - Central		DR-G1130	COTS: Canon	

Workstation – Data, Build, Central & Count			COTS: Intel – Windows Workstation	Recommended specs: 3.0GHz, Quad Core Memory – 8GB Hard Drive –RAID-Level 1 Ethernet Port – 100Mb/1Gb USB Ports Video Card - Integrated Graphics Keyboard - USB Keyboard Mouse - USB Mouse Wireless telecommunications not configured or implemented.
Monitor – Data, Build, Central & Count				Recommended specs: Aspect Ratio - Widescreen (16:9) Minimum resolution 1366x768

Testing & Inspection

Testing and evaluation of Verity 2.0 was conducted by Secretary of State staff at the Skagit County Elections Office in Mount Vernon, WA on June 9th. Examining the system for the Office of the Secretary of State was Stuart Holmes, EIS Supervisor and several members of the County Elections Department were also present.

Due to Verity 2.0 receiving National Certification from the EAC, a two phase testing program was developed and approved by Secretary of State EIS Supervisor for state certification testing.

Delivery acceptance testing of the equipment and software to determine if the correct model and versions of the equipment and software are delivered and that the equipment, software and system operate as documented by the vendor.

Election Results Testing to ensure that the equipment, software and system perform each of the functions required by federal, state and local law in order to administer an election from the beginning to the end.

Ballots were manually voted using the accessible voting unit, Touch Writer, and incorporated into the results to ensure proper tabulation.

Executive Summary of Findings of Secretary Of State Staff

Voting System Accuracy

Verity 2.0 successfully and accurate tabulated all ballots including additional hand marked and manually voted ballots from the accessible voting units. Results were manually audited and reviewed by a team of two.

Results Reporting

Verity 2.0 was able to produce the state required reports for election results by precinct and cumulative.

Ballot Generation

A reported concern with Verity 1.0 was the length of time necessary to generate ballot files that are sent to a vendor for printing. Verity 2.0 has improved performance in that area. Reducing the length of time to generate a batch of ballot images as well as increasing the batch size.

Presidential Primary

Verity 2.0 can perform all the functions necessary to comply with current state requirements for the Presidential Primary, which means it can detect cross-party voting in a Presidential Primary without manual intervention.

System Limits

Element	Limit Requirement
Precincts	2,000
Splits per Precinct	20
Total Precincts + Splits in an election	2,000
Districts For voting devices and applications	75
Parties in a General Election	24
Parties in a Primary Election	10
Contests and Propositions combined	200
Contest Choices in a Contest	75
Total Contest Choices (voting positions) in an election	600
Maximum length of contestant name	100 characters
Maximum write-in length	25 characters
Ballot Styles	N/A
Voting Types	5
Maximum Polling Places per election	1200
Maximum devices per election	2400
Maximum number of central count scanners in a single network	4
Media Device – Scan voting device	9999 sheets per vDrive
Media Device – Central application	80000 sheets per vDrive
Number of voters definable per election	1000000
Max. sheets per ballot	4 sheets
Scan - single sheet ballot	9999 Ballots
Scan - two sheet ballot	4999 Ballots
Scan - three sheet ballot	3333 Ballots
Scan – four sheet ballot	2499 Ballots
Central	1000000 Ballots
Count	4000000 CVRs, 1200 vDrives
Ballot Sizes	8.5" x 11", 8.5" x 14", 8.5" x 17", 8.5" x 19", 11" x 17"

Ballot Scanning

The Verity uses Kodak or Canon high-speed scanners capable of scanning up to 100 ballots per minute. During testing of an 8.5x14 ballot size we experienced a scanning speed of about a ballot per second.

Ballot Barcodes

Verity 2.0, similar to previous HART InterCivic voting systems, utilizes a ballot serial number to ensure that ballots cannot be scanned into the database more than once. Using this feature in conjunction with manual processes helps prevent ballots being tabulated twice.

Counties can hide the human readable serial number or can disable the serial number all-together. If counties use the serial number on the ballots, then they are required to have processes in place to ensure voter privacy.

Ballot Processing

The system will allow multiple users to adjudicate ballots simultaneously, including in the same batch. However, the most common procedure would be for one team to process one batch and another team process a different batch. User roles can be restricted so they can only perform certain tasks within the application which will reduce the risk of accidental or intentional changes.

System Security

Windows automatically boots into 'kiosk' mode which doesn't allow the user to run or access any other programs or functions of the PC. Additionally, HART 'white lists' only certain applications so they can be run on the PC. Any application not on the 'white list' cannot be run.

For certain process (i.e. tabulating ballots) the user must insert a USB key and enter the password in order to proceed. The key must be recreated before each election with a password.

Verity 2.0 also uses USB 'vDrives' to securely transfer information from one application to another. Once a 'vDrive' has been used to tabulate ballots it cannot be used again in that election.

Verity also has detailed audit logs for the entire election as well as for the user, workstation, batch, ballot, etc.

Physical Security

HART's security recommendations are:

- **Use security cameras** in the voting system storage facility.
- **Use a secure access system** and limit the number of keys to the voting system storage facility.
- **Use a burglar and fire alarm system** in the storage facility.
- **Verify that all voting devices are returned** to storage after each election.
- **Maintain an inventory of all election materials**, including any serial numbers and location information

- Voting devices
- vDrives
- Security seals and keys
- Voter registration lists/poll books
- Election results tapes, printouts, logs and reports
- **Use chain-of-custody forms and seals** when transporting equipment for any reason. Create and follow local procedures, such as sealing the inner box with serialized tamper-evident tape, logging the seal number on the chain-of-custody form, and using an outer shipping box.
- **Always check device seals** and confirm that they have not been tampered with during transport; sign the chain-of-custody document(s) upon receipt of the voting devices.
- **When accepting equipment being returned from Hart:** perform acceptance testing within 10 business days to confirm functionality and firmware version. Perform hash code testing to confirm that the certified firmware has not been compromised.

Write-Ins

Verity 2.0 allows for entering write-in candidates on the fly or selecting from a list of certified write-ins. Additionally, write-ins do not have to be processed prior to tabulation. In the event that the county determines write-ins need to be processed individually, they can be processed in the tabulation system (Count).

Accessible Voting

Verity 2.0 has an accessible voting unit that is touchscreen or has the use of accessible switches, sip-n-puff, or audio. Once the voter has completed voting, their ballot is printed onto regular ballot paper and following the county's ballot processing procedures would be incorporated in the canvassing process.

Conclusion

After an evaluation of the system, staff believes the system and its components meet current Washington State requirements for Presidential Primary, Special, Primary, and General Elections.