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# Test Plan for Election Systems & Software EVS 5.2.0.0 Colorado State Certification Test Plan

Issue Date: 06/10/2015

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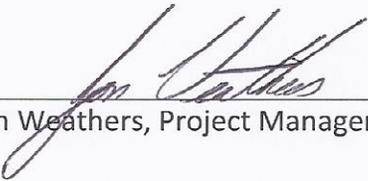


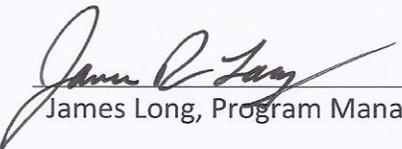
U.S. Election Assistance Commission

**VSTL**

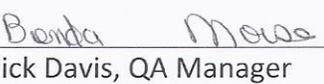
EAC Lab Code 0704

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## 1.0 INTRODUCTION

Election Systems & Software (ES&S), herein referred to as the manufacturer, submitted the Election Systems & Software Voting System (EVS) 5.2.0.0 voting system to the State of Colorado, for certification testing to Election Rules [8 CCR 1505-1] Rule 21. This Colorado Certification Test Plan, hereafter referred to as the Test Plan, presents the process and test methods that will be used to validate Rule 21 compliance of EVS 5.2.0.0.

### 1.1 Description and Overview of Submitted Voting System

EVS 5.2.0.0 is certified by the U.S. Election Assistance Commission to the 2005 Voluntary Voting System Guidelines (Certification number: ESSEVS5200). All information for this test plan was derived from the previous Certification Test Report and/or EAC Certificate of Conformance. Tables 1-1 and 1-2 describe the hardware and software/firmware versions submitted for certification testing. For a complete description of the configuration and description of the EVS 5.2.0.0 product, refer to the EVS 5.2.0.0 Test Report located on the EAC's website at <http://www.eac.gov>.

**Table 1-1. Baseline EAC Certified Software**

Software Required For Testing	Software/Firmware Version
<b>Proprietary Software</b>	
ElectionWare	4.6.0.0
Election Reporting Manager (ERM)	8.11.0.0
ES&S Event Log Service (ELS)	1.5.5.0
ExpressVote Previewer	1.4.0.0
Removable Media Service (RMS)	1.4.5.0
VAT Previewer	1.8.6.0
<b>COTS Software</b>	
Adobe Acrobat Standard	11
Cerberus FTP	6.0.7.1
Microsoft Server 2008	R2
Microsoft Windows 7, SP1	5.1
Microsoft Visual C++ 2008 Redistributable – x64	9.0.30729
Microsoft Visual C++ 2010 x64 Redistributable	10.0.40219
Microsoft Visual C++ 2010 x86 Redistributable	10.0.40219
Microsoft .net Framework	4.5.1
Micro Focus RM/COBOL Runtime	12.06
Symantec Endpoint Protection - Small Business Edition 2013	12.1.4

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## 1.1 Submitted Voting System (Continued)

**Table 1-2. Baseline EAC Certified Voting System Equipment**

Component	Hardware Version	Firmware Version
<b>Proprietary Hardware</b>		
ExpressVote Accessible Voting Station	1.0	1.4.0.0
DS200 Precinct Count Scanner	1.2.1, 1.2.3, & 1.3	2.12.0.0
DS850 Central Count Scanner	1.0	2.10.0.0
Plastic Ballot Box	1.2 & 1.3	N/A
Metal Ballot Box	1.0, 1.1, & 1.2	N/A
<b>COTS Hardware</b>		
Motorola QR Code Scanner	DS9208	N/A
Delkin USB Flash Drives	1, 2, 4, & 8GB	N/A
Delkin Compact Flash	1GB	N/A
OkiData Report Printer	OKI B6300	N/A
Avid Headphones	Avid FV 60	N/A

## 1.2 References

- Election Assistance Commission 2005 Voluntary Voting System Guidelines, Volume I, Version 1.0, "Voting System Performance Guidelines," and Volume II, Version 1.0, "National Certification Testing Guidelines," dated December 2005
- Election Assistance Commission Testing and Certification Program Manual, Version 1.0
- Election Assistance Commission Voting System Test Laboratory Program Manual
- 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
- Test Guidelines Documents: EMI-001A, "Test Guidelines for Performing Electromagnetic Interference (EMI) Testing," and EMI-002A, "Test Procedure for Testing and Documentation of Radiated and Conducted Emissions Performed on Commercial Products"
- Quality Assurance Program Manual, Revision 5
- ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment, General Requirements"
- ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment"
- EAC Requests for Interpretation (RFI) (listed on [www.eac.gov](http://www.eac.gov))
- EAC Notices of Clarification (NOC) (listed on [www.eac.gov](http://www.eac.gov))
- EAC Quality Monitoring Program residing on:  
[http://www.eac.gov/testing\\_and\\_certification/quality\\_monitoring\\_program.aspx](http://www.eac.gov/testing_and_certification/quality_monitoring_program.aspx)
- NTS Test Report No. T71379.01-01 Rev B – National Certification Test Report for Certification Testing of the Election Systems & Software EVS 5.2.0.0 Voting System

### 1.3 Terms and Abbreviations

Table 1-5 defines all terms and abbreviations applicable to this Test Plan.

**Table 1-5. Terms and Abbreviations**

Term	Abbreviation	Definition
Americans with Disabilities Act 1990	ADA	ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability.
Configuration Management	CM	---
Commercial Off-the-Shelf	COTS	Commercial, readily available hardware or software.
United States Election Assistance Commission	EAC	Commission created per the Help America Vote Act of 2002, assigned the responsibility for setting voting system standards and providing for the voluntary testing and certification of voting systems.
ES&S Event Log Service	ELS	ES&S Event Log Service is a Windows Service that runs in the background of any active ES&S Election Management software application to monitor the proper functioning of the Windows Event Viewer
Election Management System	EMS	Within the EVS 5.4.0.0 voting system, the EMS is comprised of five components: ElectionWare, ERM, ES&S Event Log Service, VAT Previewer, and ExpressVote Previewer.
Election Reporting Manager	ERM	EVS 5.4.0.0 EMS reporting component.
Election Systems and Software	ES&S	---
Equipment Under Test	EUT	Refers to the individual system component or multiple piece of the same component
ES&S Voting System	EVS	---
Functional Configuration Audit	FCA	Verification of system functions and combination of functions cited in the manufacturer's documentation.
Help America Vote Act	HAVA	Act created by United States Congress in 2002.
Intelligent Mark Recognition	IMR	Visible light scanning technology to detect completed ballot targets.
National Institute of Standards and Technology	NIST	Government organization created to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhances economic security and improves our quality of life.
Notice of Clarification	NOC	Provides further guidance and explanation on the requirements and procedures of the EAC's Voting System Certification or Voting System Testing Laboratory programs.

**Table 1-5. Terms and Abbreviations (Continued)**

Term	Abbreviation	Definition
Physical Configuration Audit	PCA	Review by accredited test laboratory to compare voting system components submitted for certification testing to the manufacturer’s technical documentation, and confirmation the documentation meets national certification requirements.
Personal Computer	PC	Computer component of the EVS 5.4.0.0 voting system.
Quality Assurance	QA	--
Request for Interpretation	RFI	A means by which a registered Manufacturer or Voting System Test Laboratory (VSTL) may seek clarification on a specific Voluntary Voting System Guidelines (VVSG) standard.
System Under Test	SUT	Refers to the system as a whole (all components)
Technical Data Package	TDP	Manufacturer documentation related to the voting system required to be submitted as a precondition of certification testing.
Trusted Build	---	Final build of source code performed by a trusted source and overseen by the manufacturer which is delivered to the EAC designated repository; also referred to as a “Witness Build”.
Underwriters Laboratories Inc.	UL	---
Uninterruptible Power Supply	UPS	---
Voter Assist Terminal	VAT	The electronic ballot marking device component is the ES&S AutoMARK.
National Technical Systems, Inc.	NTS	---
NTS Operating Procedure	OP	NTS Test Method or Test Procedure.
Voting System Test Laboratory	VSTL	NTS
Voluntary Voting System Guidelines	VVSG	EAC Voluntary Voting System Guidelines Version 1.0.
Quick Response Code	QR Code	Two-dimensional barcode

## 2.0 MATERIAL REQUIRED FOR TESTING

The materials required for certification testing of the submitted voting system include software, hardware, test materials, and deliverable materials shipped directly to NTS Huntsville by the manufacturer.

### 2.1 Software

The software required for testing is listed in Section 1.1 Table 1-1.

### 2.2 Hardware

The hardware required for testing is listed in Section 1.1 Table 1-2.

### 2.3 Support Materials

This subsection enumerates any and all test materials needed to perform voter system testing.

**Table 2-1. Test Support Materials**

Test Material	Quantity	Make	Model
Ballot on Demand Printer	1	OKI Data	C9650
ExpressPass Printer	1	Microcom	4200
ES&S Pens	5	BIC	Grip Roller
Pencil	1	Dixon	No. 2
Black Pen	1	Bic	Round Stic Med
Blue Pen	1	Bic	Round Stic Med
Red Pen	1	Bic	Cristal 1.6mm
Green Pen	1	Bic	Cristal 1.6mm
Ethernet Switch	1	Dell	HNC67M1
CF Card Reader	1	SanDisk	018-6305

## 3.0 TEST CONDITIONS AND SETUP

NTS Huntsville is an independent testing laboratory for systems and components under harsh environments, including dynamic and climatic extremes as well as the testing of electronic voting systems. NTS Huntsville holds the following accreditations:

- ISO-9001:2000
- NVLAP Accredited ISO 17025:2005
- EAC Accredited VSTL, NIST 150,150-22
- A2LA Accredited (Certification No.'s 845.01, 845.02, and 845.03)
- FCC Approved Contractor Test Site (Part 15, 18)

### 3.1 Test Facilities

All testing will be conducted at the NTS Huntsville, AL, facility unless otherwise annotated. All instrumentation, measuring, and test equipment used in the performance of this test program will be listed on the Instrumentation Equipment Sheet for each test and shall be calibrated in accordance with NTS Quality Assurance Program, which complies with the requirements of ANSI/NCSL Z540-1 and ISO 10012-1.

Standards used in performing all calibrations are traceable to the National Institute of Standards and Technology (NIST) by report number and date. When no national standards exist, the standards are traceable to international standards or the basis for calibration is otherwise documented.

Unless otherwise specified herein, all remaining tests, including system level functional testing, shall be performed at standard ambient conditions outlined in Table 3-1.

**Table 3-1. Standard Ambient Conditions.**

Event	Ambient Range
Temperature	68 to 75 degrees (°) Fahrenheit (F)
Relative Humidity	Local Site Humidity
Atmospheric Pressure	Local Site Pressure

The following tolerances listed in Table 3-2 shall be used unless otherwise specified herein.

**Table 3-2. Test Tolerances.**

Phenomena	Tolerance Allowance
Time	± 5%
Temperature	± 3.6°F (2°C)
Vibration Amplitude	± 10%
Vibration Frequency	± 2%
Random Vibration Acceleration	20 to 500 Hertz ± 1.5 dB
	500 to 2000 Hertz ± 3.0 dB
Random Overall grms	± 1.5 dB
Acoustic Overall Sound Pressure Level	+4/-2 dB

Deviations to the above tolerances may be submitted by the responsible test laboratory with sufficient engineering information to substantiate the deviation request, but only when best effort technique and system limitations indicate the need for a deviation.

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### **3.2 Test Set-up**

All voting system components (hardware and software) shall be received and documented utilizing NTS Huntsville Receiving Ticket (NTSH-0218, Rev. APR'14) and proper QA procedures. When voting system hardware is received, each test article will be unpacked and inspected for obvious signs of degradation and/or damage that may have occurred during transit. If present, noticeable degradation and/or damage, shall be recorded, photographed, and the manufacturer shall be notified. NTS Huntsville VSTL personnel will notify NTS Huntsville QA personnel that the equipment is ready for receipt inspection. QA personnel shall record the serial numbers and part numbers. Comparison shall be made between those numbers recorded and those listed on the shipper's manifest. Any discrepancies noted shall be brought to the attention of the manufacturer representative for resolution.

For test setup, the system will be configured as it would for normal field use. This includes connecting all supporting equipment and peripherals. NTS Huntsville will properly configure and initialize the system, and verify that it is ready to be tested by following the procedures detailed in the voting system TDP.

### **4.0 ELECTION DEFINITIONS AND TEST SPECIFICATIONS**

All tests will be conducted according to the test procedure contained in this document and will be performed in the order in which they are written in the test procedure. All error messages or anomalies will be collected, described, and accounted for by NTS Huntsville personnel in an Engineering Logbook. NTS Huntsville personnel will perform all testing and record the results in a final test report for the State of Colorado.

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## 4.1 Election Definitions

### **General Election: GEN-01**

A basic election held in four precincts, one of which is a split precinct, containing nineteen contests compiled into four ballot styles. Five of the contests are in all four ballot styles. The other fifteen contests are split between at least two of the precincts with a maximum of four different contests spread across the four precincts. The ballot is an 11-inch, 2-column one sided ballot. This election was designed to functionally test the handling of multiple ballot styles, support for at least two languages, and support for common voting variations.

- Closed Primary: No
- Open Primary: No
- Partisan Offices: Yes
- Non-Partisan Offices: Yes
- Write-in Voting: Yes
- Primary Presidential Delegation Nominations: No
- Ballot Rotation: No
- Straight Party Voting: Yes
- Cross-Party Endorsement: No
- Split Precincts: Yes
- Vote for N of M: Yes
- Recall Issues With Options: No
- Cumulative Voting: No
- Ranked Order Voting: No
- Provisional or Challenged Ballots: Yes
- Early Voting: No

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#### 4.1 Election Definitions (Continued)

##### **Primary Election: PRIM-01**

A closed primary election in two precincts (one precinct is a split), containing thirty contests compiled into five ballot styles. Each ballot style contains six contests. The ballot is an 11-inch, 2-column one sided ballot. This election was designed to functionally test a closed primary with multiple ballot styles and support for common voting variations.

- Closed Primary: Yes
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: No
- Straight Party voting: No
- Cross-party endorsement: No
- Split Precincts: No
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

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#### 4.1 Election Definitions (Continued)

##### **General Election: Ballot Issues**

A basic election held in a single precinct with 20 yes/no questions with one exceeding 200 words. The ballot is a 14-inch, 3-column one sided ballot.

- Closed Primary: No
- Open Primary: No
- Partisan Offices: No
- Non-Partisan Offices: Yes
- Write-in Voting: No
- Primary Presidential Delegation Nominations: No
- Ballot Rotation: No
- Straight Party Voting: No
- Cross-Party Endorsement: No
- Split Precincts: No
- Vote for N of M: No
- Recall Issues With Options: No
- Cumulative Voting: No
- Ranked Order Voting: No
- Provisional or Challenged Ballots: No
- Early Voting: No

##### **General Election: Mark Threshold/Consistency**

This election is specially designed to determine the range of marks that can be read and the range and consistency of reading marginal marks. This is an 11-inch, 3-column all filled ballot with a total of 210 ballot positions.

#### 4.2 Test Specifications

The following sections provide an outline for the individual tests that NTS Huntsville will perform to verify EVS 5.2.0.0 complies with the Colorado State Requirements. All testing will be performed in regular election mode unless otherwise stated. Any issues encountered will be documented and delivered to the Colorado Secretary of State.

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#### 4.2.1 Functional Test Specifications

Functional testing will utilize both the GEN01 and PRIM01 election definitions. Election definitions include parties for different races, selection of pair candidates (President and Vice President), n of m contest, non-partisan contest, and issues. Each election may be modified as necessary to test the Colorado State requirements listed in the Requirements Matrix (Appendix A).

#### 4.2.2 Marks/Marks Consistency Test Specifications

A series of ballots representing different colors, marks, and weights will be prepared and utilized for test. Each ballot type will be processed 100 times in both the DS200 and DS850. At the end of testing, results will be analyzed and a mark consistency percentage will be calculated. The marking protocols for the ballots are as follows:

- Beginning with ballot position one, mechanically mark at 1% fill from the center of the target with CMYK color value 0, 0, 0, 100 (BLACK). Continue marking every other ballot position at a 1% fill increase per ballot position until 100% fill is reached. Repeat marking with the following colors:
  - 97, 78, 39, 29 (MIDNIGHT BLUE)
  - 100, 100, 0, 20 (MEDIUM BLUE)
  - 100, 0, 100, 50 (GREEN)
  - 0, 100, 100, 0 (RED)
  - 0, 0, 0, 34 (DARK GRAY)
  
- Beginning with ballot position one, mechanically mark at 1% fill from the left side of the target with CMYK color value 0, 0, 0, 100 (BLACK). Continue marking every other ballot position at a 1% fill increase per ballot position until 100% fill is reached. Repeat marking with the following colors:
  - 97, 78, 39, 29 (MIDNIGHT BLUE)
  - 100, 100, 0, 20 (MEDIUM BLUE)
  - 100, 0, 100, 50 (GREEN)
  - 0, 100, 100, 0 (RED)
  - 0, 0, 0, 34 (DARK GRAY)

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#### 4.2.1 Marks/Marks Consistency Test Specifications (Continued)

- Beginning with ballot position one, mechanically mark at 1% fill from the right side of the target with CMYK color value 0, 0, 0, 100 (BLACK). Continue marking every other ballot position at a 1% fill increase per ballot position until 100% fill is reached. Repeat marking with the following colors:
  - 97, 78, 39, 29 (MIDNIGHT BLUE)
  - 100, 100, 0, 20 (MEDIUM BLUE)
  - 100, 0, 100, 50 (GREEN)
  - 0, 100, 100, 0 (RED)
  - 0, 0, 0, 34 (DARK GRAY)
- Beginning with ballot position one, mechanically mark a 1mm line at 0° that bisects the target area. Continue marking every other ballot position rotating the line at 45° until the end of ballot.
- Beginning with ballot position one, hand mark each odd position with a checkmark and every even position with an X. The marks will be made with black, blue, green, red ink pens and a No. 2 pencil.

#### 4.2.3 Multiple Ballot Issue/Large Ballot Issue Test Specifications

The Ballot Issues election definition will be utilized for this test to verify that EVS 5.2.0.0 can support a ballot with a minimum 20 pairs of “yes-no” ballot issues and at least 200 words in a single issue. A total of 20 ballots will be cast in both the DS200 and DS850. The test deck will be marked with 10 all “yes” and 10 all “no” ballots.

#### 4.2.4 Security Test Specifications

NTS Huntsville has developed operating procedures to evaluate the EVS 5.2.0.0 Voting System to the security requirements set forth in the following sections of Rule 21:

- |                    |                 |
|--------------------|-----------------|
| • 21.4.9.a         | • 21.4.10.e.(8) |
| • 21.4.9.d         | • 21.4.10.f(1)  |
| • 21.4.10.a.(2)(A) | • 21.4.10.f(2)  |
| • 21.4.10.a.(2)(B) | • 21.4.10.f(3)  |
| • 21.4.10.d.(2)(A) | • 21.4.10.g(1)  |
| • 21.4.10.e.(2)    | • 21.4.10.g(2)  |

All other security requirements are met by prior testing or found to be satisfied by the Colorado SoS office.

#### 4.2.5 Documentation Review

NTS Huntsville will evaluate the EVS 5.2.0.0 Voting System to the documentation requirements set forth in the following sections of Rule 21:

- 21.4.13.c(1)
- 21.4.13.d(2)
- 21.4.13.i(8)
- 21.4.13.q

All other documentation requirements are met by prior testing or found to be satisfied by the Colorado SoS office.

### **4.3 Test Operations Procedure**

These subsections address the procedures that NTS will follow during this testing campaign.

#### **4.3.1 Pass/Fail Criteria**

The PASS/FAIL criteria at the Component Level will be based on the expected result. If the System Under Test (SUT) performs as expected, the test is considered as passed. If the SUT does not perform as expected, the test will be evaluated for tester, test procedure, or test equipment errors. If it is determined that there were no tester, test procedure, or test equipment errors, the test will be repeated in an attempt to reproduce the results. If the results cannot be reproduced, the anomaly will be logged and monitored throughout the test campaign and subsequent testing efforts. If the results can be reproduced and the expected results are not met, the SUT will have failed the test. NTS Huntsville personnel will document the error and track the error through resolution.

The PASS/FAIL criterion for System Level testing is whether the system can continue to operate as expected. The System Level test is considered as passed if either 1) no errors are found, or 2) an error is encountered but the system continues to operate and engineering analysis determines that the root cause does not affect system level testing. The system level test is considered failed when an error is encountered and the system is too unstable to continue or engineering analysis determines the root cause could affect further testing. If an error occurs during system level testing, the error shall be documented. If the voting system is able to recover and continue, the test will continue. If the error causes the system to become unstable, the test shall be halted. All errors documented during System Level Testing will be tracked through resolution.

#### **4.3.2 Discrepancy Resolution**

The manufacturer will be required to submit a root cause analysis and correct any discrepancy before testing can be resumed. Engineering analysis will be performed to determine what effect the resolution has on the component. A determination will be made whether Regression Testing will be sufficient or if a complete re-test is necessary. All discrepancies and their resolutions will be documented on the NTS Huntsville discrepancy tracking system and reported to the State of Colorado.

#### **4.3.3 Test Results and Assessment**

NTS Huntsville personnel will test the requirements as listed in Appendix A – Colorado Requirements Testing Matrix. NTS Huntsville personnel will report all issues discovered during the test campaign to the manufacturer and the State of Colorado. If NTS Huntsville determines there is not enough data to ensure a requirement was met, the test plan will be altered and further testing will be conducted.

#### **4.3.4 Terms of NTS Huntsville Recommendation for Certification**

The State of Colorado will make the final decision to determine whether the system meets all the requirements of Rule 21. NTS Huntsville will either recommend approval if the system meets all applicable sections of the Rule 21, or report that the system does not meet all applicable sections of the Rule 21.

**APPENDIX A - COLORADO REQUIREMENTS TESTING MATRIX**



Colorado Statute	Statute Text	Disposition of requirement			
		EMS	DS200	DS850	ExpressVote
<b>21.3- Application Procedure</b>					
21.3.6	The voting system provider must coordinate with the Secretary of State for the establishment of the trusted build. The voting system provider must submit all documentation and instructions necessary for the creation and guided installation of files contained in the trusted build which will be created at the start of functional testing and will be the model tested. At a minimum, the trusted build must include a compilation of files placed on write-once media, and an established hash file distributed from a VSTL or the National Software Reference Library to compare federally certified versions. The trusted build disks should all be labeled with identification of the voting system provider's name and release version.	Trusted build from EVS 5.2.0.0 EAC Certification will be used.	Trusted build from EVS 5.2.0.0 EAC Certification will be used.	Trusted build from EVS 5.2.0.0 EAC Certification will be used.	Trusted build from EVS 5.2.0.0 EAC Certification will be used.
<b>21.4.4 - Independent Analysis</b>					
21.4.4.a	An application penetration test conducted to analyze the system for potential vulnerabilities according to current industry standards that may result from poor or improper system configuration, known or unknown hardware or software flaws, or operational weaknesses in process or technical countermeasures. The test must involve active exploitation of security vulnerabilities of the voting system, whether or not the vulnerabilities can be mitigated through compensating controls.	Requirement satisfied per CO SOS			
<b>21.4.5 - Functional Requirements</b>					
21.4.5.a	Functional requirements must address all detailed operations of the voting system related to the management and controls required to successfully conduct an election.				
21.4.5.b	The voting system must provide for appropriately authorized users to:				
21.4.5.b(1)	Set up and prepare ballots for an election;	Requirement satisfied by EVS 5.2.0.0 EAC Certification	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.5.b(2)	Lock and unlock system to prevent or allow changes to ballot design;	Testing Required	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.5.b(3)	Conduct hardware diagnostic testing;	N/A - EMS is software	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied by EVS 5.2.0.0 EAC Certification
21.4.5.b(4)	Conduct logic and accuracy testing;	Requirement satisfied by EVS 5.2.0.0 EAC Certification			
21.4.5.b(5)	Conduct an election and meet requirements as identified in this Rule 21 for procedures for voting, auditing information, inventory control where applicable, counting ballots, opening and closing polls, recounts, reporting and accumulating results;	Requirement satisfied per CO SOS			
21.4.5.b(6)	Conduct the post-election audit; and	Requirement satisfied per CO SOS			
21.4.5.b(7)	Preserve the system for future election use.	Requirement satisfied per CO SOS			
21.4.5.c	The voting system must integrate election day voting results with mail and provisional ballot results.	Testing Required	N/A - DS200 is a precinct count component	Testing Required	N/A - ExpressVote is a BMD component
21.4.5.d	The election management system must provide authorized users with the capability to produce electronic files including election results in either ASCII (both comma-delimited and fixed-width) or web-based format. The software must provide authorized users with the ability to generate these files on an "on-demand" basis. After creating such files, the authorized users must have the capability to copy the files to diskette, tape, CD-ROM or other media type.	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.5.d(1)	Exports necessary for the Secretary of State must conform to a format approved by the Secretary of State. The format must be compatible with a commercially available data management program such as a spreadsheet, database, or report generator.	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.5.e	The voting system must include hardware or software to enable the closing of the voting location and disabling the acceptance of ballots on all vote tabulation devices to allow for the following:				
21.4.5.e(1)	Printout of the time the voting system was closed.	N/A - EMS is not a precinct or central count system	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e(2)	Printout of the public counter and protective counter upon closing the ballot casting functionality.	N/A - EMS is not a precinct or central count system	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e(3)	Ability to print a report which must contain:				
21.4.5.e.3(A)	Names of the offices;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e.3(B)	Names of the candidates and party, when applicable;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e.3(C)	A tabulation of votes from ballots of different political parties at the same voting location in a primary election;	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e.3(D)	Ballot titles;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e.3(E)	Submission clauses of all initiated, referred or other ballot issues or questions; and	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e.3(F)	The number of votes counted for or against each candidate or ballot issue.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e.3(G)	Date of election (day, month and year);	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e.3(H)	Precinct number (ten digit format);	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e.3(I)	County or jurisdiction name;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e.3(J)	"State of Colorado";	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component



Colorado Statute	Statute Text	Disposition of requirement			
		EMS	DS200	DS850	ExpressVote
21.4.5.e.3(k)	Count of votes for each contest; and	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e.3(l)	An election judge's certificate with an area for judges' signatures with the words similar to: "Certified by us", and "Election Judges". Space must allow for a minimum of two signatures.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.e.4	Votes counted by a summary of the voting location and by individual precincts.	Requirement satisfied per CO SOS	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied by EVS 5.2.0.0 EAC Certification	N/A - ExpressVote is a BMD component
21.4.5.e(5)	Ability to produce multiple copies of the unofficial results at the close of the election.	N/A - EMS is not a precinct or central count system	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	N/A - ExpressVote is a BMD component
21.4.5.f	The election management system must ensure that an election setup may not be changed once ballots are printed and/or election media devices are downloaded without proper authorization and acknowledgement by the application administrative account. The application and database audit transaction logs must accurately reflect the name of the system operator making the change(s), the date and time of the change(s), and the "old" and "new" values of the change(s).	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.5.g	All DRE or BMD voting devices must use technology providing visual or auditory ballot display and selection methods used by people with disabilities	N/A - EMS is not a BMD or a DRE	N/A - DS200 is not a BMD or a DRE	N/A - DS850 is not a BMD or a DRE	Requirement satisfied by EVS 5.2.0.0 EAC Certification
21.4.5.h	All electronic voting devices supplied by the voting system provider and used at voter service and polling centers must have the capability to continue all normal voting operations and provide continuous device availability during a 2-hour period of electrical outage without any loss of election data.	N/A - EMS is not required to meet the 2-hour backup requirement	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.5.i	The voting system must provide capabilities to protect the anonymity of ballot choices.	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.5.i(1)	All optical scan devices, associated ballot boxes, and VVPAT storage devices must provide physical locks and procedures during and after the vote casting operation.	N/A - EMS is not required to meet this requirement	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied by EVS 5.2.0.0 EAC Certification	N/A - ExpressVote is a BMD component
21.4.5.i(2)	All DRE devices must provide randomization of all voter choices and stored electronic ballot information during and after storage of the voters' ballot selections.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
<b>21.4.6 - Physical and design characteristics</b>					
21.4.6.a	Physical and design characteristics must address any and all external or internal construction of the physical environment of the voting system.	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied by EVS 5.2.0.0 EAC Certification
21.4.6.b	The voting system provider must submit drawings, photographs and any related brochures or documents to assist with the evaluation of the physical design of the use of the voting system.	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied by EVS 5.2.0.0 EAC Certification	Requirement satisfied by EVS 5.2.0.0 EAC Certification
<b>21.4.7 - Ballot Definition Subsystem</b>					
21.4.7.a	The ballot definition subsystem of the voting system application consists of hardware and software required to accomplish the functions outlined in this Rule.				
21.4.7.b	The ballot definition subsystem must be capable of handling at least 200 potentially active voting positions, arranged to identify party affiliations in a primary election, offices with their associated labels and instructions, candidate names with their associated labels and instructions and ballot issues or questions with their associated text and instructions.	Testing Required	Testing Required	Testing Required	Testing Required
21.4.7.c	The voting system must accommodate single page ballots (races on one face or both faces) and two page paper ballots (races on three or four faces).	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.7.d	The ballot definition subsystem must:				
21.4.7.d(1)	Provide a facility for the definition of the ballot, including the definition of the number of allowable choices for each office and contest and for special voting options such as write-in candidates; and	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.7.d(2)	Generate all required masters and distributed copies of the ballot definition files.	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
<b>21.4.8 Trusted build</b>					
???	The voting system must allow the operating system administrative account to verify that the software installed is the certified software by comparing it to the trusted build or other reference information.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
<b>21.4.9 - Audit Capacity</b>					
21.4.9.a	The voting system must track and maintain read-only audit information of the following election management system events:				
21.4.9.a(1)	Log on and log off activity;	Testing Required	Testing Required	Testing Required	Testing Required
21.4.9.a(2)	Application start and stop;	Testing Required	Testing Required	Testing Required	Testing Required
21.4.9.a(3)	Printing activity, where applicable;	Testing Required	Testing Required	Testing Required	Testing Required
21.4.9.a(4)	Election events--set for election, unset for election, open polls, close polls, and election, upload devices, download devices, create ballots, create precincts, create districts, create voter service and polling centers, initialize devices, backup devices and voting activity; and	Testing Required	Testing Required	Testing Required	Testing Required
21.4.9.a(5)	Hardware events--add hardware, remove hardware, initialize hardware, and change hardware properties.	Testing Required	Testing Required	Testing Required	Testing Required
21.4.9.b	All tabulation devices must display the unit serial number(s) both physically and within any applicable software, logs or reports.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.9.c	Vote tabulation devices must allow for an alternate method of transfer of audit records if the device or a memory storage device is damaged or destroyed.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.9.d	All transaction audit records of the election databases must be maintained in a file outside of or separate from the database in a read-only format.	Testing Required	Testing Required	Testing Required	Testing Required
<b>21.4.10 - Security requirements</b>					
21.4.10	All voting systems must meet the following minimum system security requirements:				
21.4.10.a	The voting system must meet the following requirements to accommodate a general system of access by least privilege and role-based access control:				
21.4.10.a(1)	Operating system administrative accounts may not have access to read or write data to the database;	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.10.a.(2)	Operating system user/operator accounts must be able to be created that are restricted from the following aspects of the operating system:				

Colorado Statute	Statute Text	Disposition of requirement			
		EVS	DS200	DS850	ExpressVote
21.4.10.a.(2)(A)	No access to system root directory;	Testing Required	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.10.a.(2)(B)	No access to operating system specific folders;	Testing Required	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.10.a.(2)(C)	No access to install or remove programs; and	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.10.a.(2)(D)	No access to modify other user accounts on the system.	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.10.a.3	Application administrative accounts must have full access and rights to the application and database;	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.10.a.4	Application user/operator accounts must have limited rights specifically designed to perform functional operation within the scope of the application. This user/operator must be restricted in the creation or modification of any user/operator accounts.	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.10.b	The voting system must meet the following requirements for network security:				
21.4.10.b(1)	All network-applicable components of the voting system must have the ability to operate on a closed network dedicated to the voting system;	Requirement satisfied by EVS 5.2.0.0 EAC Certification	N/A - DS200 does not have any network components	N/A - DS850 does not have any network components	N/A - ExpressVote does not have any network components
21.4.10.b(2)	All network-applicable components of the voting system must include the limited use of non-routable IP address configurations for any device connected to the closed network. For the purposes of this requirement, non-routable IP addresses are those defined in the RFC 1918 Address base; and	Testing Required	N/A - DS200 does not have any network components	N/A - DS850 does not have any network components	N/A - ExpressVote does not have any network components
21.4.10.b(3)	The voting system must include provisions for updating security patches, software and/or service packs without access to the open network.	Requirement satisfied by EVS 5.2.0.0 EAC Certification	N/A - DS200 does not have any network components	N/A - DS850 does not have any network components	N/A - ExpressVote does not have any network components
21.4.10.c	All voting systems that use databases must: Have databases hardened to specifications developed by the voting system provider. Documentation included with the application must provide a detailed procedure for hardening according to current industry standards. Any government or industry guidelines adopted in whole, or in part, are to be identified in the documentation.	Requirement satisfied by EVS 5.2.0.0 EAC Certification	N/A - DS200 does not have any network components	N/A - DS850 does not have any network components	N/A - ExpressVote does not have any network components
21.4.10.d	The voting system must meet the following requirements for operating system security:				
21.4.10.d(1)	All voting systems must have all operating systems hardened to specifications developed by the voting system provider according to current industry standards. Documentation included with the application must provide a detailed procedure for hardening. Any government or industry guidelines adopted in whole, or in part, are to be identified in the documentation.	Requirement satisfied by EVS 5.2.0.0 EAC Certification	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.10.d(2)	The voting system provider must configure the voting system operating system of the workstation and server used for the election management software to the following requirements:				
21.4.10.d(2)(A)	The ability for the system to take an action upon inserting a removable media (auto run) must be disabled; and	Testing Required	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.10.d(2)(B)	The operating system must only boot from the drive or device identified as the primary drive.	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.10.d(3)	The voting system provider must use a virus protection/prevention application on the election management server(s)/workstations which must be capable of manual updates without the use of direct connection to the internet.	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
21.4.10.e	The voting system must meet the following requirements for password security:				
21.4.10.e(1)	All passwords must be stored and used in a non-reversible format.	Requirement satisfied per CO SOS			
21.4.10.e(2)	Passwords to the database must not be stored in the database;	Testing Required	N/A - DS200 does not have a data base component	N/A - DS850 does not have a data base component	N/A - ExpressVote does not have a data base component
21.4.10.e(3)	Password to the database must be owned and only known by the application;	Requirement satisfied per CO SOS	N/A - DS200 does not have a data base component	N/A - DS850 does not have a data base component	N/A - ExpressVote does not have a data base component
21.4.10.e(4)	The application's database management system must require separate passwords for the administrative account and each operator account;	Requirement satisfied per CO SOS	N/A - DS200 does not have a data base component	N/A - DS850 does not have a data base component	N/A - ExpressVote does not have a data base component
21.4.10.e(5)	The system must be designed in such a way to ensure that the use of the administrative account password is not required for normal operating functions;	Requirement satisfied per CO SOS			
21.4.10.e(6)	The system must be designed in such a way to facilitate the changing of passwords for each election cycle;	Requirement satisfied per CO SOS			
21.4.10.e(7)	The use of blank or empty passwords must not be permitted at any time with the exception of a limited one-time use startup password which requires a new password to be assigned before the system can be used; and	Requirement satisfied per CO SOS			
21.4.10.e(8)	All voting systems must have all components of the voting system capable of supporting passwords of a minimum of eight characters, and must be capable of including numeric, alpha and special characters in upper case or lower case used in any combination.	Testing Required	Testing Required	Testing Required	Testing Required
21.4.10.f	All modules of the system must meet the 2002 voting system standards requirements for installation of software, including hardware with embedded firmware:	Requirement satisfied by EVS 5.2.0.0 EAC Certification			
21.4.10.f(1)	Where the system includes a feature to interpret and control execution using data from a script, code tokens, or other form of control data file separate from the source code, the human-readable source information must be made available as part of a source code review.	Testing Required	Testing Required	Testing Required	Testing Required
21.4.10.f(2)	Security features and procedures must be defined and implemented to prevent any changes of interpreted data files after the initial election testing of the final election definition Replacement of the interpreted data files with tested and approved files from the trusted build must be by authorized personnel before the election definition is finalized for an election.	Testing Required	Testing Required	Testing Required	Testing Required
21.4.10.f(3)	The introduction of interpreted data during execution must not be permitted unless defined as a predefined set of commands or actions subject to security review and the interpretation function provides security edits on input to prevent the introduction of other commands or the modification or replacement of existing code.	Testing Required	Testing Required	Testing Required	Testing Required
21.4.10.f(4)	The application must not allow users to open database tables for direct editing.	Requirement satisfied per CO SOS	N/A - DS200 does not have a database component	N/A - DS850 does not have a database component	N/A - ExpressVote does not have a database component.



Colorado Statute	Statute Text	Disposition of requirement			
		EMS	DS200	DS850	ExpressVote
21.4.10.g	All voting systems must meet the following minimum requirements for removable storage media with data controls:				
21.4.10.g(1)	All voting data stored that includes, ballot images, tally data and cast vote records must be authenticated and validated.	Testing Required	Testing Required	Testing Required	N/A - ExpressVote does not store ballot images
21.4.10.g(2)	All non-voting data stored must be authenticated, encrypted, and validated.	Testing Required	Testing Required	Testing Required	Testing Required
21.4.10.g(3)	All removable media, upon insertion on server and/or workstations hosting the elections management software, must automatically be scanned by antivirus software.	Requirement satisfied per CO SOS	N/A - DS200 is a precinct count component	N/A - DS850 is a central count component	N/A - ExpressVote is a BMD component
<b>21.4.11 - Telecommunications requirements</b>					
21.4.11.a	Telecommunications includes all components of the system that transmit data outside of the closed network as defined in this Rule.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.
21.4.11.b	All electronic transmissions from a voting system must meet the 2002 Voting System Standards.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.
21.4.11.c	Modems from remote devices must be programmed to be "dial only" and not receive a call;	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.
21.4.11.d	Any modem that fails to meet the requirements of this rule may not be used by any voting system.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.
21.4.11.e	Line of sight infrared technology may only be used in a closed environment where the transmission and reception is shielded from external infrared signals and can only accept infrared signals generated from within the system.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.
21.4.11.f	All systems that transmit data over public telecommunications networks must maintain an audit trail when election results are transmitted.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.
21.4.11.g	Voting systems that transmit data through any telecommunications medium must be able to recover, either automatically or with manual intervention, from incomplete or failed transmission sessions and resume transmissions when telecommunications are reestablished.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.
21.4.11.g(1)	Recovery of transmissions must include notations of the interrupted transmission session and the resumed transmission session in the system and application transaction logs.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.
21.4.11.g(2)	Failure and recovery of transmissions must not cause any error in data transmitted from the voter service and polling centers to the central election site during a recovered transmission session.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.	N/A - EVS 5.2.0.0 does not transmit data outside of a closed network.
<b>21.4.12 - Voter-verifiable paper record requirements</b>					
21.4.12.a	Existing systems that are retrofitted to comply with section 1-5-802(1), C.R.S., must be examined for certification by the Secretary of State. Any retrofitted voting system must comply with the process and application for certification as identified by this Rule.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.b	The VVPAT must include the following components:				
21.4.12.b(1)	A paper audit trail writer or printer that must be attached, built into or used in conjunction with the DRE, and must duplicate a voter's selections from the DRE onto a paper record;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.b(2)	A paper record display unit or area that must allow a voter to view his or her paper record; and	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.b(3)	A paper record storage unit that must store cast and spoiled paper record copies securely.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.c	The VVPAT must meet the following functional requirements:				
21.4.12.c(1)	The printer may only communicate with the voting device to which it is connected;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.c(2)	The printer must function only as a printer, and not perform any other non-printer related services ;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.c(3)	Produce a paper record for every corresponding electronic voting record;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.c(4)	Provide a "low supply" warning to the election official to add paper, ink, toner, ribbon or other like supplies. In the event that an election official is required to change supplies during the process of voting, the voter must be allowed to reprint and review the paper record without having to mark his or her ballot. The device must prevent the election official from seeing a voter's ballot.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.c(5)	Stop all operations if the printer is not working as designed.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.c(6)	Allow a voter to spoil his or her paper record no more than two times.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.c(7)	Upon spoiling, the voter must be able to modify and verify selections on the DRE without having to reselect all of his or her choices.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.c(8)	Before the voter causes a third and final record to be printed the VVPAT must present the voter with a warning notice that the selections made on screen shall be final and the voter may see and verify a printout of his or her vote, but must not be given additional opportunities to change their vote.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.c(9)	When VVPAT components are integrated into a previously certified voting system the new configuration of the voting system must comply with existing state testing and auditing requirements.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.c(10)	Print a barcode with each record that contains the human readable contents of the paper record. The voting system provider must include documentation of the barcode type, protocol, and/or description of barcode and the method of reading the barcode as applicable to the voting system.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT



Colorado Statute	Statute Text	Disposition of requirement			
		EMS	DS200	DS850	ExpressVote
21.4.12.c(11)	If used for provisional ballots, the VVPAT must be able to mark paper records as a provisional ballot through the use of human readable text and optionally printing barcode and/or serial number information, which must provide for mapping the record back to the electronic record and the provisional voter for processing after verification in accordance with Article 8.5 of Title 1, C.R.S.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d	The VVPAT must meet the following design requirements:				
21.4.12.d(1)	Allow every voter to review and accept or reject his/her paper record in as private and independent manner as possible regardless of whether the voter has disability.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(2)	Print at a font size no less than 14-point sans-serif Arial.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(3)	Allow each voter to verify his or her vote on a paper record in the same language that they voted in on the DRE.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(4)	Prevent tampering with unique keys or seals for the compartment that stores the paper record.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(5)	Print and store paper record copies for at least 75 ballots cast without requiring the paper supply source, ink or toner supply, or any other similar consumable supply to be changed, assuming a fully printed double sided 18 inch ballot with a minimum of 20 contests.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(6)	The printed information on the paper record must contain at least the following items:				
21.4.12.d(6)(A)	Name or header information of race, question or issue;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(6)(B)	Voter's selections for the race information;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(6)(C)	Write-in candidate's names if selected;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(6)(D)	Undervote information;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(6)(E)	Ability to optionally produce a unique serial number (randomized to protect privacy); and	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(6)(F)	Identification that the ballot was cancelled or cast.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(7)	Prohibit the voter from leaving the voting area with the paper record.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(8)	The voting system provider must provide documentation describing how to investigate and resolve malfunctions including, but not limited to the following:				
21.4.12.d(8)(A)	Misreporting votes;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(8)(B)	Unreadable paper records;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(8)(C)	Paper jams;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(8)(D)	Low-ink;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(8)(E)	Misfeeds;	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(8)(F)	Lost votes; and	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
21.4.12.d(8)(G)	Power failures.	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT	N/A - EVS 5.2.0.0 does not have a VVPAT
<b>21.4.13 - Documentation Requirements</b>					
21.4.13.a	The Secretary of State may rely upon the testing of a voting system performed by a VSTL or by another state upon satisfaction of the following conditions:				
21.4.13.a(1)	The Secretary of State has access to any documentation, data, reports or similar information upon which the VSTL or another state relied in performing its tests and will make such information available to the public subject to any redaction required by law; and	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.a(2)	The Secretary of State has determined that the tests were conducted in accordance with appropriate engineering standards, and the extent to which the tests satisfy the requirements of sections 1-5-615 and 1-5-616, C.R.S., and all rules promulgated under those sections.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.b	In addition to other documentation requirements in this rule, the voting system provider must provide the following documents:				
21.4.13.b(1)	Standard issue users/operator manual;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.b(2)	System administrator's/application administration manual;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.b(3)	Training manual and related materials;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.b(4)	Election definition programming and diagnostics manuals; and	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.b(5)	A list of minimum services needed for the successful, secure and hardened operation of all components of the voting system.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.c	The voting system provider must provide documentation concerning the use of touch screen or other display and selection technology including:				
21.4.13.c(1)	Technical documentation describing the nature and sensitivity of the tactile device (if the system uses touch screen technology);	N/A - EMS does not have touch screen technology	Testing Required	Testing Required	Testing Required
21.4.13.c(2)	Technical documentation describing the nature and sensitivity of any other technology used;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.d	For the review of VSTL or other state testing in Rule 21.4.12(a) copies of all VSTL or state qualification reports, test logs and technical data packages must be provided to the Secretary of State.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS

Colorado Statute	Statute Text	Disposition of requirement			
		EMS	D5200	DS850	ExpressVote
21.4.13.d(1)	The voting system provider must execute and submit any necessary releases for the applicable VSTL, state and/or EAC to discuss any and all procedures and findings relevant to the voting system with the Secretary of State and allow the review by the Secretary of State of any documentation, data, reports or similar information upon which the VSTL or other state relied in performing its testing. The voting system provider must provide a copy of the documentation to the Secretary of State.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.d(2)	The voting system provider, the VSTL, the state or the EAC will identify to the Secretary of State any specific sections of documents for which they assert a legal requirement for redaction.	Testing Required	Testing Required	Testing Required	Testing Required
21.4.13.e	The voting system provider must provide documentation specifying the steps and times required for charging batteries, and the time of battery operation for each type of device they provide, assuming continuous use of the devices by voters during an interruption of normal electrical power.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.f	The Secretary of State will review submitted documentation to determine the extent to which the voting system has been tested to federal standards.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.g	Failure by the voting system provider to provide any documentation will delay processing the application and may be cause for denial of certification.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.h	The voting system must include detailed documentation, which includes the location and a description of the content of the audit trail information throughout the system. The audit information applies to:				
21.4.13.h(1)	Operating Systems (workstation, server, optical scanner, BMD, and DRE);	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.h(2)	Election management system; and	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.h(3)	Election Tabulation Devices – optical scan and DRE	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.i	The voting system provider must provide documentation detailing voting system security. The documentation must contain configurations, properties and procedures to prevent, detect and log changes to system capabilities for:				
21.4.13.i(1)	Defining ballot formats;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.i(2)	Casting and recording votes;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.i(3)	Calculating vote totals consistent with defined ballot formats;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.i(4)	Reporting vote totals;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.i(5)	Altering of voting system audit records;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.i(6)	Changing or preventing the recording of a vote;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.i(7)	Introducing data for a vote not cast by a registered voter;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.i(8)	Changing calculated vote totals;	Testing Required	Testing Required	Testing Required	Testing Required
21.4.13.i(9)	Preventing access to vote data, including individual votes and vote totals, to unauthorized individuals; and	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.i(10)	Preventing access to voter identification data and data for votes cast by the voter such that an individual can determine the content of specific votes cast by the voter.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.j	The voting system provider must provide documentation detailing the security measures it has in place for all systems, software, devices that act as connectors (upload, download, and other programming devices) and any additional recommended security measures.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.k	The voting system provider must provide procedures and documentation for the use of the VVPAT.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.l	The voting system provider must publish and specify processing standards for each component of the voting system as part of the documentation required for certification.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.m	For the purpose of evaluating software, the voting system provider must provide detailed information as to the type of hardware required to execute the software.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.n	The documentation supplied by the voting system must include a statement of all requirements and restrictions regarding environmental protection, electrical service, telecommunications service and any other facility or resource required for the installation, operation and storage of the voting system.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.o	The voting system provider must provide any available data on problems caused for persons who experience epileptic seizures due to the DRE voting device's screen refresh rate.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.p	The voting system provider must deliver to the Secretary of State documentation detailing estimated time of battery operation for each type of device submitted for certification, assuming continuous use of the devices by voters during an interruption of normal electrical power.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.4.13.q	The voting system provider must deliver to the Secretary of State documentation specifying the steps and times required for charging batteries for each type of device submitted for certification.	Testing Required	Testing Required	Testing Required	Testing Required
21.4.13.r	The voting system provider must submit documentation containing a list of minimum services and executables required to run the election management system.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
<b>21.5 Testing preparation procedures</b>					
21.5.2.d	For mark-sense or optical scan devices, the Secretary of State or the VSTL will prepare 100 or more test ballots with marking devices of various color, weight and consistency to determine the range of marks that can be read and the range and consistency of reading marginal marks.	N/A - EMS is not a mark-sense or optical scan devices	Testing Required	Testing Required	N/A - ExpressVote is not a mark-sense or optical scan devices
21.5.2.e	Ballots must be cast and counted in all applicable counter types (or counter groups) as necessary based on the parts included in the voting system. These are, at a minimum, in-person, mail, and provisional ballots. Ballots may be run through components more than one time depending on components and counter group being tested to achieve a minimum number of ballots cast as follows for each group:				
21.5.2.e(1)	Polling location / DS = 1,000;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.5.2.e(2)	Polling location / DRE = 500;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.5.2.e(3)	Mail = 1,500; and	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.5.2.e(4)	Provisional = 500.	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS
21.5.2.f	The requirements matrix must include the following requirements for election definitions and ballots to simulate and test "real world" situations in the State of Colorado. Election definitions and ballots must include the following minimum contest criteria:				
21.5.2.f(1)	Parties for different races;	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS	Requirement satisfied per CO SOS



Colorado Statute	Statute Text	Disposition of requirement			
		EMS	DS200	DS850	ExpressVote
21.5.2.f(2)	Selection of a pair of candidates, such as President and Vice-President;	Requirement satisfied per CO SOS			
21.5.2.f(3)	In a primary election, allow voters to vote for the candidates of the party for which they are eligible and for any and all non-partisan candidates and measures, while preventing them from voting on candidates of another party;	Requirement satisfied per CO SOS			
21.5.2.f(4)	In a general election, allow a voter to vote for any candidate for any office. In the number of positions allowed for the office, and to vote for any measure on the ballot that the voter is allowed to vote in, regardless of party;	Requirement satisfied per CO SOS			
21.5.2.f(5)	Allow for programming to accommodate Colorado recall questions as prescribed in Article 12 of Title 1, C.R.S.;	Requirement satisfied per CO SOS			
21.5.2.f(6)	A minimum of 20 pairs of "yes" and "no" positions for voting on ballot issues; and	Testing Required	Testing Required	Testing Required	Testing Required
21.5.2.f(7)	Ability to contain a ballot question or issue of at least 200 words.	Testing Required	Testing Required	Testing Required	Testing Required
<b>Colorado Additional Testing Requirements</b>					
<b>Rules and Statutes</b>					
1-5-407(4.5)	If no candidate has been duly nominated and no person has properly filed an affidavit of intent of write-in candidate for an office, the following text shall appear under the designation of the office: "There are no candidates for this office."	Testing Required	Testing Required	Testing Required	Testing Required
4.8.2	If there is no candidate for an office, the ballot must state, "There are no candidates for this office."	Testing Required	Testing Required	Testing Required	Testing Required
1-5-611(1)(f)(II)	If the system uses a voting device:				
1-5-611(1)(f)(III)	It contains a protective counter with a register which cannot be reset, which shall register the cumulative total number of movements of the operating mechanism.	Testing Required	Testing Required	Testing Required	Testing Required
1-5-611(1)(f)(IV)	It is capable of providing printouts of vote totals by office and candidate or by ballot issue, including a numeric-only printout to be used for testing as provided in Section 1-7-509.	Testing Required	Testing Required	Testing Required	Testing Required
1-5-615(1)	The secretary of state shall not certify any electronic or electromechanical voting system unless such system:				
1-8-5-110(2)	Voting systems shall provide a means for reporting the results of provisional ballots as a separate total when more than 25 or inclusion with mail in ballots when less than 25.	Testing Required	Testing Required	Testing Required	Testing Required
10.5.1	The official county abstract must include, by precinct or ballot style, where applicable:	Requirement satisfied per CO SOS			
10.5.1(a)	The total number of active registered electors on election day;	Testing Required	Testing Required	Testing Required	Testing Required
10.5.1(b)	The total number of registered electors (active and inactive) on election day;	Testing Required	Testing Required	Testing Required	Testing Required
18.1	Voting systems must be able to accept all or less than all pages of a multi page ballot to allow election administrators to comply with the requirement in Rule 18.1.	Testing Required	Testing Required	Testing Required	Testing Required
21.4.2	All voting systems must meet the 2002 Voting System Standards.	Requirement satisfied by EVS 5.2.0.0 EAC Certification			
1-5-704(1)	Notwithstanding any other provision of this article, each voting system certified by the secretary of state for use in local, state, and federal elections shall have the capability to accept accessible voter interface devices in the voting system configuration to allow the voting system to meet the following minimum standards:				
1-5-704(1)(e)	If a nonaudio access approach is provided, the voting system may not require color perception. The voting system shall use black text or graphics, or both, on white background or white text or graphics, or both, on black background, unless the secretary of state approves other high-contrast color combinations that do not require color perception.	N/A - Voter does not interact with the EMS	N/A - DS200 does not provide any audio support	N/A - DS850 is a central count component	Testing Required
1-5-704(1)(f)3	Any voting system that requires any visual perception shall allow the font size as it appears to the voter to be set from a minimum of fourteen points to a maximum of twenty-four points before the voting system is delivered to the polling location.	N/A - Voter does not interact with the EMS	Testing Required	N/A - DS850 is a central count component	Testing Required
1-5-704(1)(h)	For voice signals transmitted to the elector, the voting system shall provide a gain adjustable up to a minimum of twenty decibels with at least one intermediate step of twelve decibels.	N/A - EMS does not provide any audio support	N/A - DS200 does not provide any audio support	N/A - DS850 is a central count component	Testing Required
1-5-704(1)(i)	If the voting system can exceed one hundred twenty decibel sound pressure level, a mechanism shall be included to reset the volume automatically to the voting system's default volume level after every use, such as when the handset is replaced, but not before. Universal precautions in the use and sharing of headsets should be followed.	N/A - EMS does not provide any audio support	N/A - DS200 does not provide any audio support	N/A - DS850 is a central count component	Testing Required
1-5-704(1)(o)	Ballot marking devices shall meet the following standards:				
1-5-704(1)(o)(IV)	The elector shall be able to mark the ballot card in complete independence and in accordance with federal and state law on mandatory accessibility for persons with disabilities.	N/A - Voter does not interact with the EMS	Testing Required	N/A - Voter does not interact with the DS850	Testing Required