



## Office of the Secretary of State

### *Report on Dominion Voting System Comprised of Democracy Suite Election Management System 4.14 software, combined with the Dominion ImageCast Evolution, ImageCast Precinct and ImageCast Central tabulators*

#### **Overview**

Dominion Voting Systems applied to the State of New Mexico for certification of its Democracy Suite Election Management System 4.14 software, to be operated in conjunction with Dominion's line of optical scan tabulators - the ImageCast Evolution, ImageCast Precinct and ImageCast Central tabulators.

At the meeting of the Voting System Certification Committee (VSCC) held on June 24, 2013, the VSCC acknowledged receipt of the reports from the Federal Election Assistance Commission (EAC), which demonstrate that the Dominion Democracy Suite Election Management System, combined with Dominion's optical scan tabulators listed above, meets the most recent Voluntary Voting System Guidelines issued by the EAC, as required by NMSA 1978, §1-9-14(A).

The VSCC has determined that the independent testing conducted through the EAC meets the requirement for independent testing set forth in NMSA 1978, § 1-9-14(B). Those reports are posted on the Secretary of State's website. Additionally, the VSCC has been provided with all technical specifications, operating manuals and training manuals submitted by the vendor for these products.

The following report provides information for the VSCC's consideration as to whether the Dominion Democracy Suite Election Management System 4.14, in combination with Dominion's line of ImageCast optical scan tabulators, conform to the New Mexico Election Code, as required by NMSA 1978, § 1-9-14(A).

**The requirements of the New Mexico Election Code are as follows:**

#### **1-9-7.7. Voting systems; technical requirements.**

**New Mexico requirement:** Have a unique embedded internal serial number for audit purposes.

**Relationship to 2005 VVSG:** This New Mexico requirement conforms to 2005 VVSG, 4.3.6 Product Marking, which requires that "All voting systems shall identify all devices by means of a permanently affixed nameplate or label containing the name of the manufacturer or vendor, the name of the device, its part or model number, its revision letter, its serial number, and if applicable, its power requirements.

**Response:** The Imagecast Evolution, Imagecast Precinct and the Imagecast Central units all carry a serial number in a non-volatile internal memory, given to the unit at the time of its manufacture.

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**New Mexico requirement:** Be supplied with a dust-and moisture-proof cover for transportation and storage purposes.

**Relationship to 2005 VVSG:** This specific requirement is not contained in the 2005 VVSG. The guidelines provide in § 4.2.3 that voting systems shall "be capable of using, or be provided with, a protective enclosure rendering the equipment capable of withstanding (1) impact, shock and vibration loads associated with surface and air transportation, and (2) stacking loads associated with storage."

**Response:** Each ballot box has a top cover for this purpose; individual units can be transported in a dust and moisture-proof case.

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**New Mexico requirement:** If the net weight of the system, or aggregate of voting device parts, is over twenty pounds, have self-contained wheels so that the system can be easily rolled by one person on rough pavement and can roll through a standard thirty-inch door frame.

**Relationship to 2005 VVSG:** This requirement is more restrictive than the VVSG, which provides in § 4.2.2 "There is no numerical limitation on the weight of any voting equipment, but the weight of each voting machine should be compatible with its intended use and the location at which the equipment is to be used."

**Response:** All ballot boxes have casters, are designed to be moved by one person and fit through a 30 inch door. The ImageCast scanners lock to the ballot box and the unit is designed to be transported and stored locked to the ballot box.

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**New Mexico requirement:** Be a stand-alone, non-networked election system such that all pre-election, Election Day and post-election events and activities can be recorded and retained in each device.

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**Relationship to 2005 VVSG:** Section 7.9.4 of the VVSG provides that "the printer shall not be permitted to communicate with any system or machine other than the voting machine to which it is connected. The printer shall only be able to function as a printer; it shall not contain any other services (e.g., provide copier or fax functions) or network capability.

**Response:** The ImageCast Evolution, ImageCast Precinct and ImageCast Central are stand-alone, non-networked tabulators, such that all events and activities are recorded on the removable storage media resident on the tabulator. Democracy Suite is capable of operating in this manner.

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**New Mexico requirement:** Employ scalable technology allowing easy enhancements that meet United States election assistance commission standards and state law.

**Relationship to 2005 VVSG:** This requirement is not specifically found in the VVSG.

**Response:** Democracy Suite has a variety of scalable configurations and platform options. These are detailed in *2.02-System Configuration and Overview Guide*. Democracy Suite and the associated scanners have been certified by the US EAC to the VVSG 2005.

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**New Mexico requirement:** Have ancillary equipment, such as printers, power sources, microprocessors and switch, and indicator matrices that are installed internally or are modular and transportable.

**Relationship to the 2005 VVSG:** This requirement is not specifically found in the VVSG.

**Response:** All necessary printers, power supplies, and similar ancillary devices required for precinct use are built into the voting machine or ballot box.

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**New Mexico requirement:** Display publicly the number of ballots processed.

**Relationship to 2005 VVSG:** The 2005 VVSG, § 2.1.8 Ballot Counter, requires for all voting systems that each piece of voting equipment that tabulates ballots shall provide a counter that:

- A. can be set to zero before any ballots are submitted for tally;
  - B. records the number of ballots cast during a particular test cycle or election;
  - C. increases the count only by the input of a ballot;
  - D. prevents or disables the resetting of the counter by any person other than authorized persons at authorized points;
  - E. is visible to designated election officials.
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**Response:** The Imagecast Precinct scanner and the Imagecast Evolution scanner both continuously show the number of ballots processed (public counter) when polls are open then after polls are closed.

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**New Mexico Requirement:** Be able to print. (1) an alphanumeric printout of the contests, candidates and vote totals when the polls are opened so that the poll workers can verify that the counters for each candidate are on zero.

**Relationship to 2005 VVSG:** The 2005 VVSG, § 5.4.3 In-process Audit Records, requires: "Critical system status messages other than informational messages displayed by the system during the course of normal operations. These items include, but are not limited to:

- ii. The "zero totals" check conducted before opening the polling place or counting a precinct centrally."

**Response:** All ImageCast equipment is capable of printing reports to this specification. The polling place equipment can be programmed to automatically print a "zero report" upon opening of polls. ImageCast Central can also provide a "zero report".

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**New Mexico Requirement:** An alphanumeric printout of the contests, candidates and vote totals at the close of the polls, which printouts shall contain the system serial number and public counter total.

**Relationship to the 2005 VVSG:** The 2005 VVSG, § 5.4.4 Vote Tally Data, provides that voting systems shall meet these reporting requirements by providing software capable of obtaining data concerning various aspects of vote counting and producing printed reports. At a minimum, vote tally data shall include:

- A. Number of ballots cast, using each ballot configuration, by tabulator, by precinct, and by political subdivision;
- B. candidate and measure vote totals for each contest, by tabulator;
- C. the number of ballots read within each precinct and for additional jurisdictional levels, by configuration, including separate totals for each party in primary elections;
- D. separate accumulation of over votes and under votes for each contest, by tabulator, precinct and for additional jurisdictional levels (no over votes would be indicated for DRE voting devices);
- E. for paper-based systems only, the total number of ballots both able to be processed and unable to be processed; and if there are multiple card ballots, the total number of cards read.

In regard to systems that produce an electronic file containing vote tally data, the contents of the file shall include the same minimum data cited above for printed vote tally reports.

**Response:** All ImageCast equipment is capable of printing reports to this specification. The polling place equipment can be programmed to automatically print a “results report” upon closing of the polls. ImageCast Central can also provide results reports.

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**New Mexico Requirement:** Print as many copies of the alphanumeric printouts as necessary to satisfy state law.

**Relationship to the 2005 VVSG:** This requirement is specific to state law and expressly stated in the 2005 VVSG.

**Response:** All ImageCast equipment is capable of printing reports to this specification. They also allow a jurisdiction to program a default number of report copies and allow the pollworkers to print additional report copies as needed.

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**New Mexico Requirement:** Include a feature to allow reports to be sent to an electronic data file.

**Relationship to 2005 VVSG:** The 2005 VVSG, Section 4.1.7.1, provides, "in voting systems that use storage media that can be removed from the system and transported to another location for readout and report generation, these media shall use devices with demonstrated error-free retention for a period of 22 months under the environmental conditions for operation and non-operation contained in Subsection 4.1.2."

**Response:** Reports can be exported to Excel, pdf, and other formats at the jurisdiction's discretion.

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#### **1-9-7.8. Voting systems; operational requirements.**

**New Mexico requirement:** Have internal application software that is specifically designed and engineered for the election application.

**Relationship to 2005 VVSG:** This requirement is not specifically found in the 2005 VVSG. The VVSG provides: "7.4.4 Software Distribution, the vendor shall document all software including voting system software, third party software (such as operating systems and drivers) to be installed on the certified voting system, and installation programs. i.) The documentation shall have a unique identifier (such as a serial number or part number) for the following set of information: documentation, software vendor name, product name, version, the certification application number of the voting system, file names and paths or other location information (such as storage addresses) of the software."

**Response:** All internal application software is produced by Dominion Voting, specifically for elections.

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**New Mexico requirement:** Include comprehensive diagnostics designed to ensure that failures do not go undetected.

**Relationship to the 2005 VVSG:** Section 2.1.4 of the 2005 VVSG, provides:

“To ensure system integrity, all systems shall: j. Include built-in measurement, self-test, and diagnostic software and hardware for detecting and reporting the system's status and degree of operability.”

**Response:** All scanners have a power-on self-test (POST) as well as continuous monitoring of all critical functions so that malfunctions result in immediate warning to the poll worker and in unrecoverable situations, unit shutdown.

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**New Mexico requirement:** Have a real-time clock capable of recording and documenting the total time polls are opened.

**Relationship to the VVSG:** The 2005 VVSG, § 2.1.5.1, requires “All systems shall include a real-time clock as part of the system’s hardware. The system shall maintain an absolute record of the time and date or a record relative to some event whose time and data are known and recorded.”

**Response:** All scanners have a real-time clock. Poll opening and closing events are recorded in the unit's audit log.

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**New Mexico requirement:** Have a self-contained, internal backup battery that powers all components of the system that are powered by alternating current power; and, in the event of a power outage in the polling place:

- (1) the self-contained, internal backup battery power shall engage with no disruption of operation for at least two hours and with no loss of data; and

**Relationship to the 2005 VVSG:** Section 4.1.2.4 of the 2005 VVSG provides:

- c. All voting machines shall also be capable of operating for a period of at least 2 hours on backup power, such that no voting data is lost or corrupted nor normal operations interrupted. When backup power is exhausted the voting machine shall retain the contents of all memories intact.

**Response:** All scanners have an internal battery tested to maintain at least two hours of operation. In the event that battery power is exhausted, all vote totals, counters, clock time and any votes cast and confirmed to a voter are saved to internal memory.

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**New Mexico requirement:** (2) the system shall maintain all vote totals, public counter totals and the internal clock time in the event that the main power and battery backup power fail.

**Relationship to the 2005 VVSG:** Section 4.1.2.4 of the 2005 VVSG provides:

“All voting machines shall also be capable of operating for a period of at least 2 hours on backup power, such that no voting data is lost or corrupted nor normal operations interrupted. When backup power is exhausted the voting machine shall retain the contents of all memories intact.”

**Response:** In the event that battery power is exhausted, all vote totals, counters, clock time and any votes cast and confirmed to a voter are saved.

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#### **1-9-7.9. Voting systems; memory; removable storage media device; requirements.**

**New Mexico requirement:** Be programmable with removable storage media devices.

**Relationship to the 2005 VVSG:** Section 4.1.7.1 Removable Storage Media provides:

"In voting systems that use storage media that can be removed from the system and transported to another location for readout and report generation, these media shall use devices with demonstrated error-free retention for a period of 22 months under the environmental conditions for operation and non-operation contained in Subsection 4.1.2. Examples of removable storage media include: programmable read-only memory (PROM), random access memory (RAM) with battery backup, magnetic media or optical media."

**Response:** Each ImageCast scanner, as well as the Central Count scanners, are programmed through Compact Flash cards.

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**New Mexico requirement:** Contain ballot control information, summary vote totals, maintenance logs and operator logs on the removable storage media device;

**Response:** These items are carried on the Compact Flash cards for each scanner, and can be uploaded along with the results from that scanner.

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**New Mexico requirement:** Ensure that the votes stored on the removable storage media device accurately represent the actual votes cast.

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**Relationship to the 2005 VVSG:** Section 2.1.2 Accuracy, requires:

Memory hardware, such as semiconductor devices and magnetic storage media, must be accurate. The design of equipment in all voting systems shall provide for the highest possible levels of protection against mechanical, thermal, and electromagnetic stresses that impact system accuracy. Section 4 provides additional information on susceptibility requirements. To ensure vote accuracy, all systems shall:

- A. Record the election contests, candidates, and issues exactly as defined by election officials;
- B. record the appropriate options for casting and recording votes;
- C. record each vote precisely as indicated by the voter and produce an accurate report of all votes cast;
- D. include control logic and data processing methods incorporating parity and checksums (or equivalent error detection and correction methods) to demonstrate that the system has been designed for accuracy;
- E. provide software that monitors the overall quality of data read-write and transfer quality status, checking the number and types of errors that occur in any of the relevant operations on data and how they were corrected.

**Response:** ImageCast Precinct and ImageCast Evolution utilize a pair of Compact Flash cards, writing results information to each one and checking that written information so that the accuracy of the information on each card is ensured. Mismatches in card content cause the unit to give a warning message, then shut down.

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**New Mexico Requirement:** Be designed so that no executable code can be launched from random access memory.

**Relationship to the 2005 VVSG:** Section 5.2.2 Software Integrity provides:

"Self-modifying, dynamically loaded or interpreted code is prohibited, except under the security provisions outlined in Subsection 7.4. This prohibition is to ensure that the software tested and approved during the certification process remains unchanged and retains its integrity. External modification of code during execution shall be prohibited. Where the development environment (programming language and development tools) includes the following features, the software shall provide controls to prevent accidental or deliberate attempts to replace executable code:

- a. unbounded arrays or strings (includes buffers used to move data);
- b. pointer variables;
- c. dynamic memory allocation and management."

**Response:** ImageCast scanners are protected from code being launched from random access memory. The firmware for each unit is encrypted and signed when placed in the unit and only that code will execute on the scanner.

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**New Mexico requirement:** Have any operating system software stored in nonvolatile memory, which shall include internal quality checks such as parity or error detection and correction codes, and which software shall include comprehensive diagnostics to ensure that failures do not go undetected.

**Relationship to the 2005 VVSG:** Section 2.1.4 of the 2005 VVSG, provides:

“To ensure system integrity, all systems shall: j. Include built-in measurement, self-test, and diagnostic software and hardware for detecting and reporting the system's status and degree of operability.”

**Response:** The operating system for the scanners is stored in non-volatile memory on each unit. Each unit undergoes a power-on self test to ensure the integrity of its firmware prior to allowing polls to be opened.

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**New Mexico Requirement:** Allow for pre-election testing of the ballot control logic and accuracy, with results stored in the memory that is used on Election Day, and shall be capable of printing a zero-results printout prior to these tests and a results printout after the test.

**Relationship to the 2005 VVSG:** Voting systems must provide for logic and accuracy testing, which is defined as: logic and accuracy testing: Testing of the tabulator setups of a new election definition to ensure that the content correctly reflects the election being held (i.e., contests, candidates, number to be elected, ballot styles) and that all voting positions can be voted for the maximum number of eligible candidates and that results are accurately tabulated and reported.

**Response:** Pre-election logic and accuracy testing is accomplished using the same compact flash cards in each unit that will be utilized on Election Day. Zero tapes are available at the start of pre-election logic and accuracy test as well as Election Day. Results tapes are also available after pre-election logic and accuracy testing and Election Day.

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**New Mexico Requirement:** Have internal audit trail capability such that all pre-election, election day and post-election events shall be stored, recorded and recovered in an easy-to-read printed form and be retained within memory that does not require external power for memory retention.

**Relationship to 2005 VVSG:** Section 2.1.5.1 of the 2005 VVSG provides:

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“Audit records shall be prepared for all phases of election operations performed using devices controlled by the jurisdiction or its contractors. These records rely upon automated audit data acquisition and machine-generated reports, with manual input of some information. These records shall address the ballot preparation and election definition phase, system readiness tests, and voting and ballot-counting operations. The software shall activate the logging and reporting of audit data as described below.”

**Response:** Each ImageCast scanner, as well as the central election management software maintain audit trails in accordance with the VVSG 2005 requirements. These can be recovered in soft files and printed to hard copy as desired. The logs are stored on Compact Flash cards in the scanners until uploaded to the election management software.

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**New Mexico Requirement:** Possess the capability of remote transmission of election results to a central location only by reading the removable storage media devices once they have been removed from the tabulation device after the poll closing sequence has been completed; and

**Relationship to the 2005 VVSG:** As set forth above, the 2005 VVSG does not require that all certified voting systems use removable storage media devices.

**Response:** The Democracy Suite system accommodates remote transmission sites wherein the Compact Flash cards containing results and logs are removed from the scanners and the contents transmitted subsequent to that removal.

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**New Mexico Requirement:** Prevent data from being altered or destroyed by report generation or by the transmission of results.

**Relationship to the 2005 VVSG:** Section 2.4.3 Producing Reports, provides:  
"All systems shall be able to create reports summarizing the vote data on multiple levels. All systems shall provide capabilities to... (g.) prevent data from being altered or destroyed by report generation, or by the transmission of results over telecommunications lines."

**Response:** Report generation and transmission does not affect the raw results or logs. This applies to both the scanners and the election management software.

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#### **1-9-7.10. Voting systems; ballot handling and processing requirements.**

**New Mexico Requirement:** Accept a ballot that is a minimum of six inches wide and a maximum of twenty-four inches long, in dual columns and printed on both sides.

**Relationship to 2005 VVSG:** This requirement is not found in the 2005 VVSG.

**Response:** ImageCast scanners are able to scan 8.5 inch by 11, 14, 17, 20 and 22 inch ballots, two or three columns, double-sided.

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**New Mexico requirement:** Accept a ballot in any orientation when inserted by a voter.

**Relationship to 2005 VVSG:** The 2005 VVSG does not contain this requirement.

**Response:** Any of the four possible orientations are read by ImageCast scanners.

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**New Mexico requirement:** Have the capability to reject a ballot on which a voter has made more than the allowable number of selections in any contest.

**Relationship to the 2005 VVSG:** Section 2.3.3.2 Paper-based System Requirements, provides that all paper-based systems shall:

1. Provide feedback to the voter that identifies specific contests for which he or she has made no selection or fewer than the allowable number of selections (e.g., undervotes)
2. Notify the voter if he or she has made more than the allowable number of selections for any contest (e.g., overvotes)
3. Notify the voter before the ballot is cast and counted of the effect of making more than the allowable number of selections for a contest
4. Provide the voter opportunity to correct the ballot for either an undervote or overvote before the ballot is cast and counted

**Response:** Overvoted contests will cause a ballot to be rejected by the scanner.

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**New Mexico Requirement:** Be designed to accommodate the maximum number of ballot styles or ballot variations encountered in the largest New Mexico election jurisdiction.

**Relationship to 2005 VVSG:** This requirement is state-specific and is not found the 2005 VVSG.

**Response:** Democracy Suite is designed to accommodate the largest jurisdictions in the United States and can easily accommodate New Mexico jurisdiction geographic and ballot layout needs.

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**New Mexico Requirement:** Be able to read a single ballot with at least four hundred twenty voting positions.

**Relationship to 2005 VVSG:** Section 2.2.1.1 General Capabilities, provides:

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“All systems shall provide the general capabilities for ballot preparation. All systems shall be capable of... supporting the maximum number of potentially active voting positions as indicated in the system documentation.”

**Response:** Democracy Suite can prepare ballots with 462 ballot positions.

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**1-9-7.11. Voting systems; source code; escrow.**

**New Mexico requirement:** As a condition of initial certification and continued certification, the source code that operates a voting system shall be placed in escrow and be accessible to the state of New Mexico in the event the manufacturer ceases to do business or ceases to support the voting system.

**Response:** Dominion utilizes the NCC Group as escrow agent. Dominion will add the State of New Mexico to the list of allowed entities for access to the source code.

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**1-9-13 Voting system technicians.**

**New Mexico Requirement:** Voting system technicians shall be trained and certified by the Secretary of State as to their adequacy of training and expertise on voting systems certified for use in the state.

**Response:** Dominion has a variety of training courses and materials to aid in compliance with this requirement.