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2.13 - Democracy Suite System Change Notes

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Please direct inquiries to:

Manager, Administration
Dominion Voting Systems
1201 18th St., Suite 210
Denver, Colorado, 80202

Telephone: 1-866-654-8683
Facsimile: 1-416-762-8663

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Allowed Authors

subversionID	Firstname	Lastname	TitlePosition
devan.vandenboomen	Devan	Vanden Boomen	Documentation Manager
root	root		system

Contents

Notice of Confidentiality and Nondisclosure	i
Revision History	ii
Allowed Authors	iii
1 Introduction	1
1.1 Design Responsibility	1
1.2 Document Status	1
1.3 Patent Status	1
1.4 Democracy Suite [®] Overall Items Addressed	1
2 Election Management System	2
2.1 Items Addressed	2
3 ImageCast[®] Central	6
3.1 Items Addressed	6
4 ImageCast[®] Precinct	7
4.1 Items Addressed	7
4.2 Ballot Marking Device (BMD) Items Addressed	8

Chapter 1

Introduction

Per VVSG volume II, this document discusses the various changes, modifications, and upgrades to the Democracy Suite[®] product line, developed and manufactured by Dominion Voting Systems.

1.1 Design Responsibility

Dominion Voting is the design authority

1.2 Document Status

This is a working specification for discussion and analysis. Details are subject to change.

1.3 Patent Status

Certain system concepts, as well as many implementation and construction details, are protected by a series of U.S. and foreign patents pending.

1.4 Democracy Suite[®] Overall Items Addressed

1. **Performance Improvement:** All actions/processes work significantly faster with less resource consumption.
2. **Improved System Logging:** Log messages are more descriptive. Full system diagnostics can be done by looking to the log files.
3. **New Reporting Engine:** Reports are faster, more descriptive, and flexible to any custom requirements.
4. **Introduced Support for Encrypted Hard Drives:** All election data stored is encrypted.
5. **Ballot Drawing Improvements:** Introduced new concepts and components which have significant contribution on overall ballot layout.

Chapter 2

Election Management System

2.1 Items Addressed

1. **Expand ballot-rendering technology to include the ability for parameters to be edited and stored with a project which would affect the ballot configuration:**
 - a. New User Interface to configure many parameters specific to each ballot style. These include line sizes, oval/square thickness, column configuration, etc.
 - b. Ability to define allowed paper sizes.
2. **Universal Three Column Ballot Style:**
 - a. Louisiana changes to support various WinEDS importer features and the Presidential Contest format including delegates and party logos required for the General election.
 - b. Force new page or column for a contest, which will reposition the contest if it is not already at the top of a page or column within each style.
 - c. Choice Groups feature added, which allows for the heading to be placed above or below a particular choice on the Portrait ballots (required for Union Primary Demo).
3. **New York State Ballot Style:**
 - a. Converted New York ballot rendering from 3.0 hard-coded drawing and layout of ballot to version 4 drawing file technology.
 - b. Introduction of "Party Line" functionality.
 - c. Added support for 30" landscape ballot.
 - d. Print Only Choice support.
4. **New Jersey Landscape Ballot Style:**
 - a. Ballot style implemented, which is based on contest titles in the rows and parties as columns. This feature mimics the Advantage voting machine layout. It also grants the ability to specifically control which columns particular candidates are placed within.
 - b. Ballot headers can now be at the top of the ballot in addition to the original left and bottom location settings.
 - c. Control over height of individual contest rows.
5. **General Ballot, or Ballot-Styling Related:**

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- a. Support for ImageCast[®] Central profiles to render ballots in proper CMYK schema.
 - b. Additional options for positioning cell reference below or left relative to the voting box.
 - c. Ability to override text for specific No Candidate choices.

6. Electoral Group Restructuring:

- a. Elector Group Types eliminated.
- b. Elector Groups and Elector Group Combinations are now created manually.
- c. Ability for more efficient definition of complex election structures like those required for California closed primary, California decline to state, federal, Illinois Hybrid and absentee ballots.

7. Global Ordering of Election Objects:

- a. Revision of many objects in the data model to include a global order so a consistent list display can be defined.

8. Election Files passed to ICP/ICC expanded to support many new features and specifications:

- a. Tabulators and RTR now use external tabulator IDs rather than internal tabulator IDs.
- b. Support for reporting by Precinct (explicit association between ballots and precincts).
- c. Support for tracking the number of voters per contest (50+1 rule).
- d. Separate thresholds for write-in areas.
- e. Cell references on ImageCast[®] Precinct tapes (NYS).
- f. Report "double votes" (NYS).
- g. ImageCast[®] Central : results file directory structure upgraded to provide consistency with RTR directory structure and easier identification of tabulator results batches.
- h. Few NYSTEC/SysTest-identified functional discrepancies addressed and resolved.
- i. Added support for Illinois ballot layouts.

9. User Interface improvements:

- a. Added form navigation and data entry through standard keyboard shortcuts and operations instead of only mouse control.
- b. Keyboard control of the Grid list types of forms.
- c. Field tab orders were improved to operate in more logical fashion.
- d. Message spelling and grammar corrections.

10. EED New Features:

- a. Added instructional office (contest without candidate) which is represented as rectangle with text on the ballot.
- b. Office has attribute "Major" which indicates that contest of that office are more important than others.
- c. "Create Selected Proofing Ballots" option added. Purpose is to create proofing ballots only for selected ballots in search list.
- d. Barcode is removed from proofing ballots, and the ballots are clearly marked that cannot be used on Election Day.
- e. Improved security on iButtons.

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- f. Introduced "Programming Groups". Tabulators can be grouped in chunks in order to split job on multiple EDES (Election Data Exchange Station) applications.
 - g. Improved security components to become fully NIST compliant.
 - h. Grids have option "Set Table Item Count". It limits max number of rows that will be shown.
 - i. Added setting in project parameters for fine tuning regarding creation of ballot images, audio files and other tabulator supported files.
 - j. Ability to change external IDs for certain entities added. Usability improvement: attributes for ballots and tabulators can be set by importing txt file which is properly formatted.
 - k. Added ability to specify length of the pause in text which is automatically converted into audio files.
 - l. Added ability to export Audio studio definition file with all audio files from the project. Audio files can be easily proofed using Audio Studio application.

11. Adjudication support includes basic interaction with the Adjudication application for election information and the exchange of write-in names and results.

12. RTR New Features and Improvements:

- a. Report multiple write-ins separately.
- b. Add column showing tabulators with images loaded.
- c. Option to report results on main or split precincts.
- d. Automatically load tabulator results batches when they appear as alternative to manual selection and processing.
- e. Tracking of "Double-Votes" in scenarios where a choice is multi-party affiliated.
- f. New report in RTR showing tabulator status. This will aide in determining which RTM transfers have completed their workload or not.
- g. RTR to automatically load and process results files as they appear in a specific folder.
- h. Include default result export package in newly created projects.
- i. New RTR feature allowing for better monitoring of activities by RTM.
- j. RTR is able to load messages and log files from directory transferred by RTM application.
- k. Added ability to load results for tabulators that do not have a closed poll.
- l. RTR is capable of exporting results in various formats. It also has the added ability to import the new export package, and activate/deactivate existing exports. This new export package will define the new export format that can be customized to user requests and therefore will will reduce the time it takes to be created.
- m. Ability to export audit images after they are loaded, per given criteria (for example, results file status, given contest, over and under voted ballots, blank ballots) added.
- n. The ability to specify precinct (ED) for the manual entry of the results file.
- o. Improved x/y (number of reported/total number of precincts (EDs)) progress report.
- p. Added global setting on the election level either to load raw or tabulated result files in the database.

13. Administrative/Security:

- a. Option to regenerate security keys before election file creation.
- b. Allow for user specification of default Admin & TechAdvisor passwords.

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- c. Template Keyword file management.
 - d. New York-specific security enhancements:
 - Limited SQL injection vulnerabilities
 - Removal of identified attack vectors
 - Removal of stub code
 - Introduction of cryptography to comply with identified issues

14. Election Data Exchange Station:

- a. Update to Ubuntu 12.04
- b. Support encrypted passwords
- c. Other updates as needed to support new election file naming

15. Enhanced RTF editor.

16. Automated Test Deck (ATD):

- a. Specific New York enhancements added

17. Updates to ImageCast[®] Precinct hardware to address component obsolescence.

Chapter 3

ImageCast Central

3.1 Items Addressed

1. ICC runs with DRS Scanner

- a. Kofax removed as obligatory to the ICC application.
- b. Independent abstract scanner class generated to communicate with the scanner.
- c. Kofax code implemented as only one component of this class.
- d. DRS implemented into this class as another component.

2. ICC DRS Scanner diverts ballots on specified criteria

- a. User interface features added to replace the current Pause on Exception feature. Instead, this addition uses the sorting mechanisms of the DRS scanner.
- b. New checkboxes have been added to allow the user to select whether or not the ballots in any given bin (of the three available) are added to the results tally.

3. New warning messages

- a. Language changed in the error message that prompts when a ballot is shorter/longer than expected.
- b. The new messages read “Ballot longer than expected” and “Ballot shorter than expected”.
- c. Language changed in error message that prompts when a ballot has been incorrectly detected.
- d. The new message reads “Ballot misread”.

4. Party Affiliations added to results report

- a. DCF option enabled to allow party affiliation reporting within the results report.

5. Central Count Canon DR-X10C scanner added

Chapter 4

ImageCast Precinct

4.1 Items Addressed

1. Print Results by Precinct

- a. Implemented ICP functionality to print results by precinct. Previously, the ICP could only print results by ballot ID or as overall totals.
- b. The level of granularity on the results tapes is specified through DCF options.

2. Signature lines after each precinct results grouping on ICP thermal tapes

- a. Witness signature lines can be printed at the very end of the results tape, at the end of each precinct section of the results tape, or both.
- b. This preference is specified through DCF options.

3. DCF Integer option required to limit the number of Precinct/Portions reported upon

- a. A new DCF integers option was introduced that ensures that only the over all results totals are included on the print tapes if too many precincts/splits are contained in the election files.
- b. The DCF value is entered as an integer, and if the total number of precincts plus precinct splits exceeds the value, the ICP will only print overall results totals, even if precinct-level results are requested elsewhere in the DCF settings.

4. Audio Confirmation that the ballot has been successfully cast on the ICP

- a. The ICP now includes an optional audio confirmation (sequence of two beeps) indicating that a ballot has been successfully cast.
- b. This feature can be toggled on or off via a new DCF setting.

5. Handling of Double Votes/Push Votes

- a. A "Push Vote" or "Double Vote" is the condition where a voter fills in more than one voting target for a cross-endorsed candidate. In this case, the ICP will count one vote for the candidate and the vote will be attributed to the highest ranking party on the ballot (typically DEM or REP as opposed to LIB or CON for example). The added functionality in this release includes:

- The ability to prompt the user with a warning message when this condition is present
- The ability to include the number of Double Votes/Push Votes on the results tape (# of Double-Votes/Push Votes = # of completed voting targets - 1 for a given candidate)

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- DCF options are used to configure this functionality

6. **Ballot Review screens include party abbreviations for cross-endorsed candidates**
 - a. The ballot review screens now indicate the party affiliation for any cross-endorsed candidates.
7. **Minor changes to Overvote screen messages**
 - a. Some minor changes were made to the overvote message screens.

4.2 Ballot Marking Device (BMD) Items Addressed

1. **Address the Disjointedness Between the Human and Synthesized Voices:** Previously, all instructions were recorded in a human voice, and all ballot content was recorded in a synthesized voice. Many voters have complained about this disjointedness between the two. Since, all instructions were re-recorded using a computerized female voice.
2. **Standardize Language:** Button descriptors used throughout the voting process were quite inconsistent. To help streamline the voting process, standardized language was incorporated when referring to certain actions and parts of the three interfaces. For example, buttons on the Audio Tactile Interface are now always referred to by their direction and then their color. For example, the *blue, down arrow*, and the *yellow, up arrow*.
3. **Simplify the Language Used:** Certain words and phrases used throughout the voting process were too advanced for some voters. Many directions and messages have been rephrased in much simpler and direct language.
4. **Provide more detailed instructions when needed:** More information has been included to help make the voting experience easier. These changes include:
 - a. A simple instruction alerting voters to the fact that the BMD can, at times, be slow in responding to their selections has been added to the introductory screens to help alleviate unnecessary panic and confusion.
 - b. A new screen with an accompanying audio instruction giving a brief overview of the BMD has been added.
 - c. A new screen and accompanying audio instruction providing brief details on all three input devices and how they work has been added.
 - d. Voters are now informed that the green help bar should be located closest to them so that they know they are holding the Audio Tactile Interface correctly.
 - e. More details on how to use the Help button have been added. Voters can now press it to receive a reminder of each button's functionality, or press it to receive pollworker assistance.
 - f. Voters are now informed that they should turn off the screen if they are blind in order to allow the BMD to better suit their needs.
5. **Condense and edit the instructions:** Some of the previous instruction files were repetitive and redundant. The content of the instructions has been edited and certain files have been removed to ensure the most amount of information is communicated in the most succinct fashion.
6. **Rearrange the order of instructions:** The flow between instructions has been changed so that information is communicated as effectively as possible.
7. **Match audio and screen instructions:** At points, certain screens did not match the audio being played. The audio has been adjusted accordingly to match what is presented on screen.

8. **Address how the machine functions during instructions when the machine is off:** Instructions played while the screen is off have been condensed and minimized to make it quicker for blind voters to reach the ballot. Prompts have also been added so that blind voters know how to advance through the instructions.