★ VIRGINIA ★
STATE BOARD *of* ELECTIONS

BOARD MEETING

Tuesday, June 24, 2014
General Assembly Building
Room C
4:00 PM

BOARD WORKING PAPERS

STATE BOARD OF ELECTIONS
AGENDA

DATE: June 24, 2014
LOCATION: General Assembly Building, Room C
TIME: 4:00 p.m.

I. CALL TO ORDER	*Charles E. Judd* *Chair*
II. APPROVAL OF MINUTES **June 10, 2014**	*SBE Board Members*
III. SECRETARY'S REPORT	*Donald Palmer* *Secretary*
IV. REPORT FROM LEGAL COUNSEL	*Kristina Perry Stoney* *SBE Legal Counsel*
V. OLD BUSINESS **Voter Identification Regulations** ❖ **1VAC20-40-10** ❖ **1VAC20-40-90**	
VI. NEW BUSINESS	
A. Certification of the Results Congressional Election – June 10, 2014	*Matt Abell* *Elections Services Lead*
B. Ballot Position Drawing for August 19, 2014 38 Senate District	*Matt Abell*
C. Certification Voting System – ES&S	*Gary Fox* *Voting Technology Specialist*
D. Democracy Live Presentation	*TBA*

VII. OTHER BUSINESS & PUBLIC COMMENT
VIII. EXECUTIVE CLOSED SESSION
Discussion of Pending Litigation Matters
IX. GOOD OF THE ORDER

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STATE BOARD *of* ELECTIONS

Call to Order

BOARD WORKING PAPERS

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STATE BOARD *of* ELECTIONS

Approval of Minutes
June 10, 2014

BOARD WORKING PAPERS
SBE Board Members

MINUTES

The State Board of Elections Board Meeting was held on Tuesday, June 10, 2014. The meeting was held in the Washington Building, 1100 Bank Street, Richmond, Virginia, Room B27. In attendance, representing the State Board of Elections (SBE) was Charles Judd, Chair; Kimberly Bowers, Vice Chair; Donald Palmer, Secretary; Edgardo Cortés, Deputy Secretary; Kristina Perry Stoney, Senior Assistant Attorney General and SBE Counsel; Anna Birkenheier, Assistant Attorney General and SBE Counsel; Chris Piper, Election Services Manager; Myron McClees, SBE Policy Analyst: Martha Brissette, SBE Policy Analyst, and Rose Mansfield, Executive Assistant. Chairman Judd called the meeting to order at 10:15AM. Chairman Judd noted the delay in Board Meeting start time was due to a demonstration of the voter identification card production system. Chairman Judd stated that the SBE staff developed the program and the associated training and staff deserves accolades for the entire process and acknowledgement of their efforts.

The first order of business was the approval of the Minutes from the State Board of Elections Board Meeting held on May 14, 2014. Chairman Judd asked if Board Members had any additions or corrections to the May 14, 2014 Board Minutes. Ms. Stoney noted a transcription error and cited the error for the record and for change. Chairman Judd asked if there were additional additions or deletions to the Minutes and there were none. Secretary Palmer moved to adopt the Minutes for the May 14, 2014, Board Meeting as amended. Vice Chair Bowers seconded the motion and the Board unanimously approved the Minutes.

The second order of business was the Secretary's Report delivered by Secretary Palmer. Secretary Palmer stated that the commonwealth was conducting a federal primary on this date and the polls opened without issue. Secretary Palmer stated that statewide pricing was successfully negotiated by SBE staff with the four vendors who are now certified to sell equipment in Virginia and this pricing should be a benefit to localities and voting system vendors. Secretary Palmer noted that Voter Photo Identification testing with general registrar' offices will start today taking place through June, 2014. The software design and production was designed by SBE staff and SBE will

be responsible for printing and mailing the cards. Secretary Palmer stated that the Virginia Board of Disabilities was provided with a voter ID production demonstration and were pleased with the program. Terry Wagoner, Absentee Ballot Coordinator, spoke at the annual conference for the Board of Disabilities about the new law and the guidelines that will be provided to the election community. The mobility/portability portion of this program is scheduled for testing in July, 2014 and available for use on or about August 1. Chairman Judd asked if there were any questions and there were none.

The next order of business was the Legal Report delivered by Kristina Perry Stoney, Senior Assistant Attorney General and SBE Counsel and Anna Birkenheier, Assistant Attorney General and SBE Counsel. Ms. Stoney stated that the letters of assurance for matters to be discussed before the Board were provided to Board Members. Ms. Stoney stated that currently there are two pending requests for opinions from the attorney general regarding; (i) whether campaign finance regulation are exempt from the Administrative Process Act (APA) process and (ii) deals with how to fill a vacancy of an electoral board member when vacated mid-term. Ms. Birkenheier stated that the *Page* v. *SBE* trial was held on May 21-22, 2014. The judges asked for post-trial briefs and the projected time frame for additional action is July, 2014. Chairman Judd asked if there were any questions and there were none.

The next order of business was the General Registrar and Electoral Board Survey update presented by Edgardo Cortés, Deputy Secretary. Deputy Cortés stated that SBE is in the process of selecting individuals to serve as members of the working group on the review of duties and responsibilities of general registrars and electoral board members. Recommendations for members have been received from the electoral board members and the general registrar's of the commonwealth. Deputy Cortés stated that members will be selected to form the workgroup from different size localities and geographical areas within the commonwealth. SBE has received documents that represent prior efforts on a study. The members selected will be announced at the Board Meeting on June 24, 2014. Chairman Judd asked if there were any questions and there were none.

The next order of business was the Approval of Chapter 45 presented by Martha Brissette, SBE Policy Analyst. Ms. Brissette stated that the new Chapter 45 subject matter is *Absent and Overseas Voters*. Ms. Brissette stated that at the April 23, 2014

Board Meeting the Board requested staff to present the new Chapter 45 and underlying periodic reviews when the regulation dealing with material omissions from absentee envelope B could be considered with public comment invited. Staff accordingly has prepared a separate action to allow public comment on proposed changes to the regulations dealing with material omissions from absentee ballots. The proposed new Chapter 45 has already been published for public comment with no comments received. Vice Chair Bowers moved *that the Board approve the new Chapter 45, Military and Overseas voting, including updated federal form references, to be effective on filing with the Registrar of Regulations.* Secretary Palmer seconded the motion and Chairman Judd asked if there were any comments and there were none. The Board unanimously passed the motion.

The next order of business was the approval of the periodic review of Chapter 40 presented by Martha Brissette, SBE Policy Analyst. Ms. Brissette stated that the Board approved publishing the proposed changes to Chapter 40 for public comment at the December 2, 2013 Board Meeting. No comments on the proposed changes were received during the public comment period. SBE staff is recommending the Board adopt proposed amendments to its regulations on voter registration to conclude its periodic review announced May 15, 2013 pursuant to 1VAC 20-10-120. Vice Chair Bowers moved *that the Board approve the proposed changes to Chapter 40, Voter Registration, in the Town Hall action titled 2013 Periodic Review Voter Registration, to be effective on filing with the Register of Regulations.* Chairman Judd seconded the motion and Chairman Judd asked if there were any comments and there were none. The Board unanimously passed the motion.

The next order of business was the approval of the periodic review of Chapter 70 presented by Martha Brissette, SBE Policy Analyst. Ms. Brissette stated the Board approved publishing the proposed changes to Chapter 70 for public comment at the December 2, 2013 Board Meeting. No comments on the proposed changes were received during the public comment period. Secretary Palmer moved *that the Board approve the proposed changes to Chapter 70, Absentee Voting, in the Town Hall action titled 2013 Periodic Review Absentee, to be effective on filing with the Register of Regulations.* Vice

Chair Bowers seconded the motion and Chairman Judd asked if there were any comments and there were none. The Board unanimously passed the motion.

The next order of business was the approval of the proposed amendments to regulations on Material Omissions present by Martha Brissette, SBE Policy Analyst. Ms. Brissette stated that legislation enacted in the 2014 session adjusts the balance the Board struck in applying the strict requirements of the *Code*. Two regulations need to be amended to conform to the legislative changes. First, the regulation dealing with material omissions from Envelope B needs to be revised to allow omission of date and middle name or initial so long as first and last names are provided. This regulation also needs to be adjusted to clarify that a sealed outer envelope allows accepting a voted ballot not fully sealed inside Envelope B. The Federal Write-In Absentee Ballot (FWAB) regulation is adjusted to provide the same standard. If positively approved for comment, the proposed regulation will be submitted by tomorrow's noon deadline for publication on June 30, 2014 and a comment forum through Monday, July 21, 2014, for presentation of a final regulation to the Board at the next Board Meeting. Ms. Brissette identified the changes in the regulations for the Board Members.

In addition to the proposed changes, Chairman Judd stated that: (i) the order of the first and last name should be considered a material omission; (ii) the generational suffix should be considered a material omission, and (iii) the street identifier i.e. drive verses court, should be considered a material omission. Chairman Judd stated: "We are trying to protect the integrity of the voter and we want the records to be intact." Secretary Palmer stated: "The suggestion of strictly requiring the last name first and then last name last on the affidavit is of some concern as it is somewhat counterintuitive. Most individuals simply place their first and last name. In the last session, the General Assembly did not seem concerned over what order of the name provide but rather the fact that election officials receive the first and last names of the individual. The generational suffix is important in some instances where individuals are living at the same residence and the street identifier is a mistake that could be easily made. Virginia's counting of absentee ballots has increased to 99 percent and whatever the Board has been doing is yielding Virginia excellent results and is working. The General Assembly laid out the affidavit form in the *Code*." Vice Chair Bowers stated: "From a data entry perspective

most systems ask for the last name first. There is concern about the generational suffix if two voters with the same name absent the suffix, Senior or Junior, at the same address and one requests an absentee ballot and leaves the suffix absent and then the other goes to the polls to vote. How will you be able to tell which voter had requested the absentee ballot and had concluded the voting process." Secretary Palmer stated that Envelope B is an affidavit confirming the identity and residence of the individuals, substitutes for identification and that is signed by the voter and witnessed by another person. Secretary Palmer moved *that Board seek public comment on the proposed amendments to its regulations addressing material omissions on absentee ballots to include the suggestions on the generational suffix that include: (i) the voter omitted the generational suffix when one or more individuals with the same name are registered at the same address and it is impossible to determine the identity of the voter from Envelope B; (and (ii) the voter did not provide his house number and street identifier or rural route address. Additionally, staff recommendation for public comment on absentee ballots at 1VAC-20-70-20 and 20-7-30[20-45-40] to implement recently enacted legislation effective July 1, 2014.* Vice Chair Bowers seconded the motion. Chairman Judd asked if there were any public comments.

Theresa Martin, League of Women Voters of Virginia, approached the podium. Ms. Martin stated regarding the street identifier that the street signs in her neighborhood have been changed twice in the last five years which emphasizes the opportunity for confusion regarding voters at the polls. Chairman Judd asked if there were any other comments.

Bill Jenkins, General Registrar-Sussex County, approached the podium. Mr. Jenkins stated: "As a registrar I finds it hard to believe that people do not know exactly where they live. I only need to know two things; who you are and where do you live. This determines in local elections who you vote for." Chairman Judd asked if there were any other comments. The Board unanimously passed the motion.

The next order of business was the proposed amendments to regulation on Photo Voter Identification Cards present by Myron McClees, SBE Policy Analyst. Mr. McClees stated that the general assembly passed legislation in 2013 that requires all individuals in-person to show a photo identification document prior to casting a regular ballot.

Concomitant with this requirement was the duty of SBE to assist general registrars in providing free photo identification to voters that do not possess one of the requisite forms of identification. The bill included a delayed implementation date of July 1, 2014. A proposed regulation was presented before the Board during the April 2, 2014 Board Meeting. Statements received during the comment period were provided to the Board during the May 14, 2014 meeting. Mr. McClees presented two grammatical changes for the Boards consideration.

Secretary Palmer provided a definition of "Permanent Satellite Location" to the Board Members. Chairman Judd stated for clarification the general registrars would provide photo identification services as a standard service. Secretary Palmer moved *that a definition for "Permanent Satellite Location" to be defined as an office managed, maintained, and operated under the control of the general registrar for the locality that is consistently operation throughout the year and is not the principal office of the general registrar. Offices of other agencies where registration takes place pursuant to Virginia Code § 24.2-412(B) are not considered permanent satellite locations.* Vice Chair Bowers seconded the motion and Chairman Judd asked if there were any comments and there were none. The Board unanimously approved the motion.

Secretary Palmer informed the Board that the definition for "Valid" is included in the Board Materials as it relates to photo identification. Chairman Judd asked if there were any comments.

Courtney Mills, Staff Attorney for the Fair Election Legal Network, asked for a clarification on the "appearance of the voter". Ms. Mills stated that some states are addressing the issue of transgender voters who present differently in person. Chairman Judd asked: "How are the other states addressing this issue?" Ms. Mills stated: "I believe they are still addressing the issue." Ms. Stoney stated that the proposed regulation does allow the voter to request a replacement for their identification if their appearance has changed substantially. Chairman Judd asked if there were additional comments.

Lisa Wooten, General Registrar and President of VRAV; Jake Washburn, General Registrar of Albemarle County; William Bell, Secretary of Isle of Wight County, and Bill Jenkins, General Registrar of Sussex County provided comment. Mr. Bell expressed concern about individuals requesting photo voter identification cards in the days before

the election. Ms. Wooten expressed concern about placing her signature on the temporary identification card of a voter from another locality.

Vice Chair Bowers stated that if the proposed definition for "Valid" had inserted "regardless of expiration date" the definition would accurately reflect the intent of1VAC20-40-10. Deputy Cortés recommended that staff meet separately to revise the language to present for Board approval at today's meeting. Ms. Stoney stated that the revision would allow the opportunity to address the issue of transgender and would suggest that in Section E the insertion be added: "Or the identification document could not otherwise be considered valid". Secretary Palmer moved *that the proposed amendments to regulations on Photo Voter Identification Cards be tabled.* Chairman Judd seconded the motion and the Board unanimously passed the motion.

Chairman Judd noted that section 1VAC20-40-90 was still on the table. Mr. McClees stated that there are changes within this section and noted each of the changes. Secretary Palmer noted that in Section C the period of time when the temporary document will be considered an acceptable form of identification and 30 days after the issuance. Secretary Palmer suggested language to support this change from 45 days to 30 days, "The general registrar shall provide voter identification document to any eligible voter whose application for the voter photo identification card is made after the deadline for registering to vote and in the next proximate election in which the voter is eligible to vote is received through Election Day. The temporary identification card should be considered as an acceptable form of identification for 30 days after issuance." Secretary Palmer moved *that the suggested changes be adopted by modifying the draft 1VAC-20-40-90 striking the words "is received during the voting period through Election Day for the next most proximate election period, striking 45 and inserting the phrase "for the photo voter identification card is made after the registration deadline and registering to vote in the next most proximate election for which the voter is eligible to vote and inserting 30 days."* Vice Chair Bowers seconded the motion and Chairman Judd asked if there were any comments on the changes.

Lisa Wooten, General Registrar and President of VRAV; Jake Washburn, General Registrar of Albemarle County; William Bell, Secretary of Isle of Wight County, and Bill Jenkins, General Registrar of Sussex County provided comment. Chairman Judd asked if

there were additional comments. Ms. Stoney stated that Section F include language allowing for a voter photo identification if the voter is included on the Division of Motor Vehicle (DMV) database if the identification would not otherwise be considered valid. Secretary Palmer moved; *that in Section C the words "is received during the absentee voting period through election day for the next most proximate election." be stricken; that 1VAC-20-40-90 in Section C be revised to include the phrase "for the voter photo identification cards made after the registration deadline and registering to vote in the next most proximate election for which the voter is eligible to vote."; that 45 days be stricken and that 30 days be inserted in Section C.; that the words voter photo identification card be added before the word "application" in Section C and that the words "or identification document is not considered valid" added to the end of the first sentence in Section F.* Vice Chair seconded the motion and the Board unanimously approved the amended motion. Secretary Palmer moved *that the Board adopt regulation 1VAC 20-40-90 voter photo identification card.* Vice Chair Bowers seconded motion. Chairman Judd asked if there were additional comments and there were none. The Board unanimously approved the motion.

The next order of business was the Experian Presentation presented by Bill Butler, Senior Product Manager. Mr. Butler presented the Board Members with materials related to the presentation and explained the details of the services Experian has offered to Orange County, California by auditing the voter registration rolls and showing savings and enhanced accuracy of voters who have moved in state or out of state. Mr. Butler emphasized the need for voter rolls list maintenance. Secretary Palmer informed Mr. Butler that a proposal for pilot project specific to meet Virginia needs should be prepared and presented to the Board Members. Chairman Judd asked if there were any public comments.

Marian Schneider, Staff Attorney for the Advancement Project, approached the podium. Ms. Schneider commented on the need to tread carefully when using third-party credit reporting data. Chairman Judd asked if there were additional public comments.

Therese Martin, League of Women Voters of Virginia, approached the podium. Ms. Martin stated that the list of eligible identifications are inconsistent at the locality level and encouraged the Board Members to have the localities describe the acceptable

forms of identification utilizing the same language. Ms. Martin stated that any locality that utilizes a post office box for their mailing address should include a street address so that voters can locate the office. Chairman Judd asked if there were additional comments.

Courtney Mills, Fair Elections Network, approached the podium. Ms. Mills asked: "Was it communicated to the general registrars when providing IDs to voters outside their locality, that they are to compare signatures on the photo voter ID application to the voter registration forms? Secretary Palmer replied: "No, and the registrar would not have access to the signature to make the comparison." Chairman Judd asked if there were additional comments.

Chairman Judd moved *that the tabled agenda item regarding proposed Amendments to Regulations on Photo Voter Identification Cards presented by Myron McClees., SBE Policy Analyst be readdressed.* Vice Chair Bowers seconded the motion and the Board unanimously approved the motion. Secretary Palmer stated that the proposed regulation provides the definition of "permanent satellite location" means an office managed and operated under the control of the general registrar for the locality that is consistently operational throughout the year and is not the principle office of the general registrar. Offices of other agencies where registration takes place pursuant to *Virginia Code* § 24.2-412(B) are not considered permanent satellite locations. Secretary Palmer stated that the definition of "valid" for all purposes related to voter identification shall mean documents containing the name and photograph of the voter appearing to be genuinely issued by the agency or issuing entity appearing upon the document where the bearer of the document reasonably appears to be the person whose photograph is contained thereon. Other data contained on the document, including but not limited to expiration date, shall not be considered in determining the validity of the document. Secretary Palmer stated this language was proposed by SBE Staff. Secretary Palmer moved *that the cited definitions of "permanent satellite location" and "valid" be incorporated into 1VAC 20-20-10.* Vice Chair Bowers seconded the motion and Chairman Judd asked if there were comments and there were none. The Board unanimously approved the motion.

Chairman Judd asked if there were comments for the Good of the Order. Deputy Cortés expressed gratitude to Ms. Susan Lee, Election Uniformity Manager; Mr. Matt

Davis, Information Technology Manager and their teams for their efforts in preparing for the photo identification program ready for implementation.

Chairman Judd moved *that the Board adjourn*. Vice Chair Bowers seconded the motion and without further comment the Board voted to adjourn. The meeting was adjourned at approximately 12:30PM.

The Board shall reconvene on June 24, 2014 at 4:00PM in the General Assembly Building, Room C.

_____

Secretary

_____

Chair

_____

Vice Chair

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STATE BOARD *of* ELECTIONS

Secretary's Report

BOARD WORKING PAPERS

Donald Palmer
SBE Secretary

SENATE OF VIRGINIA

MARK D. OBENSHAIN
26TH SENATORIAL DISTRICT
ALL OF PAGE, RAPPAHANNOCK,
SHENANDOAH, AND WARREN COUNTIES;
ALL OF THE CITY OF HARRISONBURG;
AND PART OF ROCKINGHAM COUNTY
POST OFFICE BOX 555
HARRISONBURG, VIRGINIA 22803

COMMITTEE ASSIGNMENTS:
PRIVILEGES AND ELECTIONS, CHAIR
AGRICULTURE, CONSERVATION AND
NATURAL RESOURCES
COMMERCE AND LABOR
COURTS OF JUSTICE
RULES

June 16, 2014

Mr. Don Palmer, Secretary
Virginia State Board of Elections
1100 Bank Street, First Floor
Richmond, VA 23219

Dear Secretary Palmer:

I write you with regard to the newly adopted regulation on voter photo identification documents, 1 VAC 20-40-10, adopted on Friday, June 13th. This regulation defines terms and develops mechanisms pertaining to the new voter photo identification requirements established in Senate Bill 1256 of 2013, of which I was patron.

I appreciate the efforts of the State Board of Elections in implementing this law, but I am concerned that the definition of "valid" adopted by the Board is in conflict with state law. The Code of Virginia, at § 24.2-643 B, requires that a voter show, *inter alia*, a valid Virginia driver's license, valid United States passport, or valid student or employee photo identification card. The State Board, by regulation, now defines expired IDs—regardless of how much time has transpired since their expiration—as being expressly "valid," which, to my thinking, violates the plain meaning of the statute. "Valid" is not a term of art or a term susceptible to confusion. IT has a plain meeting. The action of the Board seeks to define "valid" as including "invalid."

The term "valid Virginia driver's license" is never defined in Code, but appears in fourteen sections, most frequently pertaining to the operation of a motor vehicle. Few would argue that an expired license constitutes a "valid" license for purposes of employment as an escort driver, operating a forklift, or transporting children. Valid licenses are also an acceptable proof of identity for jurors and political candidates placing broadcast advertisement. In all of these cases, it is highly unlikely that an expired license would be deemed acceptable.

The U.S. Code of Federal Regulations, moreover, requires at Title 22, §53.1 a "valid U.S. passport" for citizens entering and departing the country. Although the purposes for

which election officers would use passports are obviously dramatically different, the essential fact remains: the federal government clearly regards a "valid U.S. passport" as an unexpired document that would entitle the bearer to exit and return to the country, whereas the State Board intends to regard such documents as valid when, by their issuers' own terms, they are clearly invalid. Had the General Assembly desired to accept expired forms of identification, it would not have adopted legislation expressly requiring such identification to be valid without any language indicating a construction exceeding the plain meaning of that term.

The new Rule adopted by the State Board goes beyond expiration dates, moreover, stipulating that "[o]ther data contained on the [photo identification] document, including but not limited to expiration date, shall not be considered in determining the validity of the document." This provides unclear guidance to registrars and election officers, who may be uncertain about their ability to deny a (non-provisional) ballot to an individual producing a document that clearly indicates ineligibility to vote in Virginia.

I understand the Board's aims in adopting this flexible standard, but I am deeply concerned about the inconsistency between this standard and state law. I am also troubled by the absence of a public comment period for what constitutes a substantial regulatory policy determination. Although 1 VAC 2-40-10 was first published as a draft in April, and a public comment period ensued, those copies did not include any definition of "valid"—a provision added last week, without any input from the public nor any attempt to solicit the insights of legislators, myself included, who have worked on this issue.

I first became aware of this matter on Friday afternoon and was assured by a member of the Board that the new definition was in draft regulations that would receive a subsequent public comment period. Unfortunately, that is not the case.

Given the significance of this issue and the clear tension between elements of this Rule and provisions of state election law, I would urge the Board of Elections to revisit this matter immediately and to open any subsequent action to public comment. Whether or not the new Rule can be justified on policy grounds, I believe it to be inconsistent with the 2013 legislation that precipitated it and consider the manner in which the Board took up the issue to fall short of the standards of transparency to which I know you aspire and have sought to inculcate.

With best regards,

Very truly yours,

Mark D. Obenshain

SENATE OF VIRGINIA

June 23, 2014

State Board of Elections
Washington Building
1100 Bank Street, First Floor
Richmond, Virginia 23219

Dear Chairman Judd, Vice-Chairman Bowers, and Secretary Palmer:

We write to you in regards to 1 VAC 20-40-10, a recent regulation approved by the Virginia State Board of Elections concerning the definition of "valid," and in support of the ability of the Board to promulgate the regulation. The Board finalized the regulation in question on June 10, 2014, over a year after the legislation was approved by the General Assembly and after soliciting public comment. Re-opening discussion on an already finalized regulation is an inefficient use of the already limited time to finalize plans before implementation of the new voter ID law.

Additional changes to this regulation would prolong the finalization of an implementation plan and only serve to narrow the window of time to inform the public of which IDs are acceptable for use in upcoming elections. Considering the new photo ID law is the third ID requirement Virginia voters will be subject to in three years, combined with the lack of funding for education and outreach by the Board, any limitation on the amount of time available for public education could have a serious impact on voter confusion and potentially limit voters' ability to obtain a proper ID.

The definition of valid approved by the Board on June 10th was a proper exercise of the Board's authority. The Board has express statutory authorization to make the rules and regulations that govern the administration of Virginia elections (Va. Code Ann. § 24.2-103(A)). The term "valid" is not defined by Virginia statute or regulation. While Va. Code Ann. § 24.2-643(B) (the "Photo Voter ID" law effective July 1, 2014) uses the term "valid" to describe a necessary element of a permitted form of voter ID, it does not explain what in fact constitutes a "valid" ID. Moreover, the term is not defined in any section of Title 24.2 ("Elections"). Virginia's Administrative Code also provides the Board no guidance on what makes an ID "valid." The term is never used in reference to IDs throughout the existing State Board of Elections administrative code and is not clearly defined in

any other section of the VAC. We are confident the Board is well within its power to promulgate a regulation defining the term.

We urge the Board to retain their current definition of "valid" for identification purposes and to focus instead on educating voters about the newest change to the voter ID standard before upcoming elections.

Sincerely,

Adam Ebbin

L. Louise Lucas

Barbara Favola

Henry L. Marsh III

COMMONWEALTH OF VIRGINIA

HOUSE OF DELEGATES

RICHMOND

June 23, 2014

State Board of Elections
Washington Building
1100 Bank Street, First Floor
Richmond, VA 23219

Dear Chairman Judd, Vice-Chairman Bowers, and Secretary Palmer,

We write to you in regards to 1 VAC 20-40-10, a recent regulation approved by the Virginia State Board of Elections concerning the definition of "valid," and in support of the ability of the Board to promulgate the regulation. The Board finalized the regulation in question on June 10, 2014, over a year after the legislation was approved by the General Assembly and after soliciting public comment. Re-opening discussion on an already finalized regulation is an inefficient use of the already limited time to finalize plans before implementation of the new voter ID law.

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The definition of valid approved by the Board on June 10th was a proper exercise of the Board's authority. The Board has express statutory authorization to make the rules and regulations that govern the administration of Virginia elections (Va. Code Ann. § 24.2-103(A)). The term "valid" is not defined by Virginia statute or regulation. While Va. Code Ann. § 24.2-643(B) (the "Photo Voter ID" law effective July 1, 2014) uses the term "valid" to describe a necessary element of a permitted form of voter ID, it does not explain what in fact constitutes a "valid" ID. Moreover, the term is not defined in any section of Title 24.2 ("Elections"). Virginia's Administrative Code also provides the Board no guidance on what makes an ID "valid." The term is never used in reference to IDs throughout the existing State Board of Elections administrative code and is not clearly defined in any other section of the VAC. We are confident the Board is well within its power to promulgate a regulation defining the term.

We urge the Board to retain their current definition of "valid" for identification purposes and to focus instead on educating voters about the newest change to the voter ID standard before upcoming elections.

Sincerely,

Delegate Robert Brink (District 48)

Delegate Mark Sickles (District 43)

Delegate Algie Howell (District 90)

Delegate K. Rob Krupicka (District 45)

Delegate Michael Futrell (District 2)

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STATE BOARD *of* ELECTIONS

Legal Report

BOARD WORKING PAPERS

Kristina Perry Stoney
Senior Assistant Attorney General

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STATE BOARD *of* ELECTIONS

Old Business

BOARD WORKING PAPERS

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STATE BOARD *of* ELECTIONS

New Business

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STATE BOARD *of* ELECTIONS

Certification of the Results Congressional Election June 10, 2014

BOARD WORKING PAPERS
SBE Board Members

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STATE BOARD *of* ELECTIONS

Ballot Position Drawing
August 19, 2014
38th Senate District

BOARD WORKING PAPERS
Matt Abell
Election Services Lead

★ VIRGINIA ★
STATE BOARD *of* ELECTIONS

Certification Voting System
ES & S

BOARD WORKING PAPERS

Gary Fox
Voting Technology Specialist

Memorandum

To: Members of the State Board of Elections

From: Gary W. Fox, Voting Technology Specialist

Date: June 9, 2014

Re: Certification of ES&S EVS 5.2.0.0/5.2.0.1 voting systems

Suggested motion for a Board member to make:

I move that the Board certify ES&S (Election System & Software) EVS 5.2.0.0/5.2.0.1 voting systems for use in elections in the Commonwealth of Virginia, pursuant to the *State Certification of Voting Systems: Requirements and Procedures*.

Applicable Code Sections: §§ 24.2-628 & 629.

Attachments:

Your Board materials include the following:

- Virginia State Certification Testing Test Report for ES&S EVS 5.2.0.0/5.2.0.1 voting systems.
- Product sheets for ES&S EVS 5.2.0.0/5.2.0.1 voting systems.
- EAC Grant of Certification of ES&S EVS 5.2.0.0/5.2.0.1 voting systems.
- NTS Labs (formerly Wyle Labs) Test of EVS 5.2.0.0 voting system.

Background:

Following the steps prescribed in the Virginia *State Certification of Voting Systems: Requirements and Procedures*, ES&S initiated the certification evaluation by a letter to the Secretary of State Board of Elections on April 28, 2014. ES&S also provided their corresponding Technical Data Package and Corporate Information (required under step 2 of the *Requirements and Procedures*) on April 28, 2014. Both of these submissions were deemed complete and in sufficient detail to warrant Step 3, the Preliminary Review. During the preliminary review, the state-designated evaluation agent conducted a preliminary analysis of the TDP, Corporate Information, and other materials provided and prepared an Evaluation Proposal (i.e. Test Plan). Upon ES&S' agreement with the test plan, the evaluation was conducted on April 28 – May 1, 2014, in the State Board of Elections offices in Richmond, Virginia. The ES&S EVS 5.2.0.0/5.2.0.1 voting system successfully completed Virginia State Certification. The 5.2.0.1 system was a Virginia modification made to 5.2.0.0 to allow for additional hardware to be

used by localities if desired. On May 16, 2013, the Election Assistance Commission (EAC) issued their Grant of Certification of the ES&S EVS 5.2.0.0. EVS 5.2.0.1 is the same system as ES&S EVS 5.2.0.0 with the addition of the plastic ballot box and a write-in report. NTS (National Technical Systems formerly Wyle Laboratories) completed successful testing on March 1, 2013.

Test Report

ES&S EVS 5.2.0.0 / EVS 5.2.0.1
State Certification Testing
April 27-30, 2014
Virginia State Board of Elections
1100 Bank Street, 1st Floor
Richmond, VA 23219

v. 2014.01

1 Authority

Section § 24.2-629 of the *Code of Virginia* authorizes the Virginia State Board of Elections, in the manner prescribed by the Board, to have examined a production model of such equipment and ballots associated with a vendors request for State Certification. The corresponding Virginia State Certification of Voting Systems *Requirements and Procedures* (Rev. 3/3/2010) prescribes the manner of which the Virginia State Board of Elections will conduct the state certification testing. Subsequent to the evaluation, the Board is required to prepare and file in its office a report of its finding as to:

(i) the apparent capability of such equipment to accurately count, register, and report votes;

(ii) whether the system can be conveniently used without undue confusion to the voter;

(iii) its accessibility to voters with disabilities;

(iv) whether the system can be safely used without undue potential for fraud;

(v) the ease of its operation and transportation by voting equipment custodians and officers of election;

(vi) the financial stability of the vendor and manufacturer;

(vii) whether the system meets the requirements of this title;

(viii) whether the system meets federal requirements;

(ix) whether issues of reliability and security identified with the system by other state governments have been adequately addressed by the vendor; and

(x) whether, in the opinion of the Board, the potential for approval of such system is such as to justify further examination and testing.

2 Background

Following the steps prescribed in the Virginia State Certification of Voting Systems *Requirements and Procedures* (Rev. 4/2012), Election Systems and Software (ES&S) initiated the certification evaluation by a letter to the Virginia State Board of Elections on April 14, 2014. Additionally, ES&S provided their corresponding Technical Data Package and Corporate Information (required under step 2 of the *Requirements and Procedures*) along with the letter.

Both of these submissions were deemed complete and in sufficient detail to warrant Step 3, the Preliminary Review. During the preliminary review, the state-designated evaluation agent (Pro V&V, Inc.) conducted a preliminary analysis of the TDP, Corporate Information, and other materials provided and prepares an Evaluation Proposal (i.e. Test Plan). Upon ES&S's agreement with the test plan, the evaluation was conducted on April 27-30 in the State Board of Elections offices in Richmond, Virginia.

Per the ES&S submitted application, as of April 14, 2014, National Technical Systems (NTS) has completed the trusted builds, final regression tests, and is currently finalizing a test report with the EAC that recommends certification of the EVS 5.2.0.0 / EVS 5.2.0.1 system, signifying successful completion of conformance testing to the 2005 *Voluntary Voting System Guidelines (VVSG).*

The evaluation focused on the introduction of the ElectionWare software and the ExpressVote Universal Voting System as well as firmware updates for the DS200, DS850, and the AutoMARK, which were previously certified for use in Virginia as part of the ES&S Unity 3.4.0.1 test campaign.

ES&S submitted a firmware update to the DS200 (DS200 v. 2.12.0.1) to provide the ability to handle write-in votes electronically when using a plastic ballot box without a diverter. The firmware update was submitted to NTS who reviewed and tested the submission. Upon completion of NTS's testing, Pro V&V perform regression testing at NTS's facility to ensure the update met the requirements of the Commonwealth of Virginia.

3 Testing Overview

The evaluation of EVS 5.2.0.0 / EVS 5.2.0.1 was designed to achieve the goals set forth in the test plan. The goals were constructed to verify that the EVS 5.2.0.0 / EVS 5.2.0.1 conforms to the *Code of Virginia.* The evaluation successfully addressed each of the test goals in the following way:

Test Goal	Testing Response
Ensure EVS 5.2.0.0 / EVS 5.2.0.1 provides support for all Virginia election management requirements (i.e. ballot design, results reporting, etc).	This was tested by evaluating the EVS 5.2.0.0 / EVS 5.2.0.1 with 7 Virginia specific election scenarios using a combination of different ballot programming approaches, ballot designs, ballot

	sizes, languages, and tabulators. The programmed elections were actual elections from Virginia counties. The end-to-end scenario was directly from recent elections in Virginia.
Simulate pre-election, Election Day, absentee, and post-election activities on the DS200 and corresponding components of the EVS 5.2.0.0 / EVS 5.2.0.1 EMS for 5 election scenarios	The DS200 was tested in pre-election, in-person absentee, Election Day, absentee, post-election and recount situations and evaluated against documented behavior and expected results for all 5 scenarios.
Simulate pre-election, Election Day, and post-election activities on the DS850 and corresponding components of the EVS 5.2.0.0 / EVS 5.2.0.1 EMS for 5 election scenarios	The DS850 was tested in pre-election, in-person absentee, Election Day, absentee, and post-election situations and evaluated against documented behavior and expected results.

4 Testing Setup

The evaluation consisted of 7 election scenarios to be executed utilizing one setup of the EVS 5.2.0.0 / EVS 5.2.0.1. It was configured in the standalone configuration with a single EMS workstation executing the EVS software detailed in section 4.1 below. This setup included a DS200 tabulator, a DS850 tabulator, an AutoMARK Voter Assist Terminal (VAT) and an ExpressVote.

The following election scenarios were used for the evaluation:

Pre-programmed scenarios:

1. Hanover 2009 Primary Election, 14-inch ballots
2. Chesterfield 2007 General Elections, 14-inch ballots
3. Chesterfield 2008 General Elections, 14-inch ballots
4. Chesterfield 2009 Primary Election, 11-inch ballots

5. Fairfax (or equivalent size/complexity) 2010 General Election Multi-Language (English, Spanish), 17-inch ballots
6. Fairfax (or equivalent size/complexity) 2011 Primary Elections Multi-Language (English, Spanish), 17-inch ballots

End-to-end scenario:

7. Chesterfield (or equivalent size/complexity) 2012 General Elections (with Preference language) Multi-Language (English, Spanish), 14-inch ballots.
8. Recount for scenario 2, above.

The pre-programmed scenarios were programmed by ES&S prior to the evaluation and were executed from the point where the election definition was completed in ElectionWare. Each testing scenario began with opening the election, reviewing the election definition, and proceeding with the remaining preparations for Election Day and absentee voting.

The end-to-end scenario created a new election for an existing county, generate elections definitions for the tabulators and verify loading of the election definition on the tabulators.

More details on the testing setup are found below:

Election Scenario	**Ballot Programming**	**EVS 5.2.0.0 / EVS 5.2.0.1 Configuration**	**Equipment Used**	**Ballot Length**	**Languages**	**# Ballots Run**
Hanover 2009 Primary Election	Ballot Style	Standalone workstation	DS200, DS850	14-inch	English	120
Chesterfield 2007 General Election	Precinct	Standalone workstation	DS200, DS850	14-inch	English	90
Chesterfield 2008 General Election	Ballot Style	Standalone workstation	DS200, DS850	14-inch	English	96
Chesterfield 2009 Primary Election	Ballot Style	Standalone workstation	DS200, DS850	11-inch	English	62
Fairfax 2010 General Election	Precinct	Standalone workstation	DS200, DS850	17-inch	English, Spanish	10,564
Fairfax 2011 Primary	Ballot	Standalone	DS200,	17-inch	English	64

Election	Style	workstation	DS850		Spanish	
Chesterfield 2012 General Election (End-to-End)	Precinct	Standalone workstation	DS200, DS850	14-inch	English, Spanish	2
Chesterfield 2007 General Recount	Precinct	Standalone workstation	DS200, DS850	14-inch	English	36

The additional testing preformed at the NTS facility on the DS200 firmware version 2.12.0.1 consisted of loading the DS200 with the Chesterfield 2007 General Election and running a test deck with many voting variations containing write-in votes. After running of the test deck, the polls were closed and the write-in votes were viewed on the DS200 screen. The Fairfax 2010 General Election test data from the April evaluation was then loaded and the write-in votes were also examined on the DS200 screen.

4.1 Testing Candidate

Supporting the evaluation, ES&S provided the following components of the EVS 5.2.0.0 / EVS 5.2.0.1, which were verified by serial number, hardware version, and firmware/software version.

Virginia State Certification of EVS 5.2.0.0 / EVS 5.2.0.1 **Compliance:** 2005 VVSG Standard		
Election Management System (EMS)	ElectionWare	4.6.0.0
	Election Reporting Manager (ERM)	8.11.0.0
	Removable Media Service	1.4.5.0
	Event Log Service	1.5.5.0
	VAT Previewer	1.8.6.0
	ExpressVote Previewer	1.4.0.0
ES&S Tabulators	DS200 Precinct Tabulator (HW 1.2 & 1.3)	2.12.0.0 2.12.0.1
	DS850 Central Tabulator (HW 1.0)	2.10.0.0
Voter Assist Terminal (VAT)	AutoMARK (HW 1.0, 1.1, & 1.3)	1.8.6.0
Universal Voting System	ExpressVote (HW 1.0)	1.4.0.0
Ballot Bins	Metal Ballot Bin with Diverter Plastic Ballot Bin	

The DS200 firmware version for this certification can be either 2.12.0.0 or 2.12.0.1. To use firmware version 2.12.0.0, the metal ballot box must be used to divert write-in ballots physically. The firmware version 2.12.0.1 can be used with either the metal ballot box or the plastic ballot box.

4.2 Test Decks

Test decks for the pre-programmed scenarios were provided ES&S and verified by the test team. Ballots were provided in the quantity and marked in the manner prescribed in the Test Plan.

5 Findings

The evaluation followed the procedure as provided in Section 6 of the Test plan. During the procedure, the test team (including members of the State Board of Elections and the evaluation agent) made observations of general system behavior and attempted to verify specific behavior related to Virginia legal requirements. Therefore, the findings are organized below into findings related to each Virginia requirement and other findings which were reported during the evaluation.

5.1 Virginia Requirements

The evaluation of the EVS 5.2.0.0 / EVS 5.2.0.1 produced the following findings for each requirement of the *Virginia Code*. For each requirement, the EVS 5.2.0.0 / EVS 5.2.0.1 was evaluated for its ability to meet and pass the requirement and whether or not anomalies were reported.

1. **§ 24.2-629. The voting system shall accurately count, register, and report votes.**
Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ All results reports provide the correct/expected results for the test ballots inserted. This includes individual machine aggregated results.
- ✓ Public and protected counters increment for each ballot.

The evaluation of the EVS 5.2.0.0 / EVS 5.2.0.1 found that the tabulated results matched the expected results for each test deck of ballots inserted into each tabulator. The public counters incremented appropriately and tabulator audit logs correctly recorded ballot tabulation events. The DS200 and DS850 each provided a protected counter which correctly incremented with each ballot tabulated. The EVS 5.2.0.0 / EVS 5.2.0.1 EMS correctly aggregated and reported results from each of the various tabulators into pre-defined and consolidated reporting groups. Comparison of the results tapes from individual machines and the result reports generated in EMS with the test ballots for all three election scenarios was used as the basis for verifying accurate counting and reporting of votes.

2. **§ 24.2-629. The voting system shall provide the ability for voting for all candidates of as many political parties as may make nominations at any election; on as many**

questions as may be submitted at any election; and at all general or special elections, permit the voter to vote for all of the candidates of one party or in part for the candidates of one or more parties.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Election scenarios (including primary elections) are fully supported by voting system without anomaly or burden.
- ✓ The voter is allowed to vote as intended and otherwise permissible.
- ✓ Overvotes are correctly handled and reported.
- ✓ Undervotes are correctly handled and reported.
- ✓ Blank ballots are correctly handled and reported.
- ✓ Write-Ins are correctly handled and reported.

The EVS 5.2.0.0 / EVS 5.2.0.1 supported primary election and general election scenarios of various setups and sizes without anomaly or burden. The evaluation found that EVS 5.2.0.0 / EVS 5.2.0.1 provided the ability for voting for all candidates of as many political parties as were nominated in the election scenarios. Furthermore, the system demonstrated the ability for the voter to vote for all candidates of one party or in part for the candidate of one or more parties.

3. **§ 24.2-629. The voting system shall enable the voter to vote for as many persons for an office as lawfully permitted; prevent the voter from voting for the same person more than once for the same office (only on DREs); and enable the voter to vote on any question he is lawfully permitted to vote on, but no other.**

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Voter is shown questions based on eligibility (i.e. precinct)
- ✓ Voter is only shown questions (s)he is eligible to vote on
- ✓ Voter is not shown questions (s)he is not eligible to vote on
- ✓ Voter is permitted to select for correct number of options on each question.

The evaluation of the EVS 5.2.0.0 / EVS 5.2.0.1 found that voters were shown questions

based on eligibility determined by the voter's ballot style assignment or precinct. Each ballot style was generated such that voters were only shown questions for which the voter was eligible to vote on and no others. The voter was permitted to vote for as many or as few questions as desired on the ballot style and was able to cast a vote for the number of persons configured for each question.

4. **§ 24.2-629. The voting system shall correctly register or record, and accurately count all votes cast for candidates and on questions**.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ All results reports provide the correct/expected results for the test ballots inserted. This includes individual machine and aggregated results.
- ✓ Accurately record vote count for each candidate
- ✓ Record number of overvotes, undervotes, write-ins, and blank votes for each question.

The evaluation of the EVS 5.2.0.0 / EVS 5.2.0.1 found that the tabulated results matched the expected results for each test deck of ballots inserted into each tabulator. The system supported statistical counters for each candidate and option on a question plus counters for write-ins, undervotes, and overvotes. Each statistical counter was verified to accurately record the tabulated results from the test deck.

5. **§ 24.2-629. The voting system shall be provided with a "protective counter" whereby any operation of the device before or after the election will be detected.**

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Each tabulator stores a life-time ballot count which can be accessed and recorded prior to and at the conclusion of an election. The protective counter must be in persistent memory.
- ✓ The counter increments correctly for each ballot tabulated.

Each of the tabulators evaluated provides a protective (lifetime) counter.

6. **§ 24.2-629. The voting system shall be provided with a counter which shall show at all times during an election how many persons have voted.**

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Each tabulator provides a public counter which corresponds to the number of ballots processed for this election.
- ✓ The counter increments correctly for each ballot tabulated.

Each tabulator evaluated provided a public, election specific counter which is publically displayed for each voter to see increment as a ballot is cast. The evaluation found that this counter correctly incremented for each ballot cast and matched the total number of ballots cast when the polls were closed.

7. **§ 24.2-629. The voting system shall be provided with a model, illustrating the manner of voting and suitable for the instruction of voters.**

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ The method of voting is consistent with standard voting models and behavior such that voting operation is intuitive and teachable.

The method of voting employed with the EVS 5.2.0.0 / EVS 5.2.0.1 is consistent with standard voting models and behavior such that the voting operation is teachable and understandable to voters.

8. **§ 24.2-629. The voting system shall enable each voter to vote for all the presidential electors of one party by one operation. It shall have a ballot containing the words "Electors For" preceded by the name of the party or other authorized designation and the names of its candidates for the offices of President and Vice-President and a mechanism which registers the collective vote cast for such electors.**

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Ballots designed, printed, voted, and tabulated in end to end scenario must provide this language and behavior

Each tabulator supports the ability for each voter to vote for all the presidential electors of one party by one operation. The ballot design and printing capabilities of EVS 5.2.0.0 / EVS

5.2.0.1 provide for ballots containing the words "Electors For" preceded by the name of the party or other authorized designation and the names of its candidates for the offices of President and Vice-President. Additionally, the results reporting capabilities provide a mechanism to register a collective vote cast for each such elector presented on the ballot.

9. **§ 24.2-629. The voting system shall ensure voting in absolute secrecy; and systems requiring the voter to vote a ballot that is inserted in an electronic counting device shall provide for secrecy of the ballot and a method to conceal the voted ballot.**

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Audit logs contain no record of voter's identity.
- ✓ Ballot can be kept reasonable private through the use of a privacy sleeve.
- ✓ Ballot box provides secrecy protections and access controls.
- ✓ Voter is not required to have assistance when voting

No mechanism is available within EVS 5.2.0.0 / EVS 5.2.0.1 to connect a voted ballot back to the voter. The EVS 5.2.0.0 / EVS 5.2.0.1 provides sufficient accessibility support to allow voters with disabilities to vote independently. No personal identifying information is required by the voting system in order to operate and no personal identifying information is transmitted to or stored by any ballot tabulator. Each precinct-count tabulator is provided with a secure ballot box (secured with lock/key and tamper-evident seals) to conceal the tabulated ballots. Privacy sleeves and privacy booths can be used by a voter to conceal the ballot prior to insertion into the tabulator

10. **§24.2-629 & 24.2-648. The voting system shall segregate ballots containing write-in votes from all others.**

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Each tabulator correctly out stacks ballots with valid write-in voters from ballots without write-in votes
- ✓ Write-in ballots are physically separated from other ballots.

Both the DS200 and the DS850 tabulators provide the ability to segregate ballots containing write-ins from all other ballots. The DS200 detects write-ins on the ballots as they are

tabulated and divert the write-in ballots to a separate side of the ballot box from the other ballots. The DS850 will detect a write-in during the tabulation and out stacks to a configurable tray in order for the operator to remove the write-in ballot and set it aside.

11. **§ 24.2-629. The voting system shall (for systems requiring the voter to vote a ballot that is inserted in an electronic counting device) report, if possible, the number of ballots on which a voter voted for a lesser number of candidates for an office than the number he was lawfully entitled to vote and the number of ballots on which a voter voted for a greater number of candidates than the number he was lawfully entitled to vote.**

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Each tabulator correctly records and reports the number of overvotes, undervotes, write-ins, and blank votes for each question

The EVS 5.2.0.0 / EVS 5.2.0.1 provides statistical counters for each question which record the number of votes cast for each candidate/option on a question, the number of undervotes cast for that question, and the number of overvotes cast for that question. The statistical counters were evaluated during the testing by casting ballots with undervotes and overvotes in each question. The results were verified to have correctly registered these undervoted and overvoted ballots.

12. **§ 24.2-629. The voting system shall be programmable, if possible, to allow such undervoted and overvoted ballots to be separated when necessary**.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Each tabulator must demonstrate its ability to out stack (physically separate) ballots with either an undervote or overvote in one or more question

The EVS 5.2.0.0 / EVS 5.2.0.1 system provides various mechanisms for handling overvotes and undervotes which can be enabled/disabled by the election and machine setup: the DS200 and the DS850 can be set to query the voter upon detection of an overvote on the ballot; the DS200 and the DS850 can also be set to query the voter upon detection of an undervote on any one specific question or a number of questions.

13. § 24.2-629. The voting system shall provide the voter with an opportunity to correct any error before a permanent record is preserved.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Each precinct-based tabulator should query the voter when an under vote or overvote is detected on her ballot as to whether the voter intended on casting such a voter.
- ✓ The tabulator should respond appropriately to the voter's response by either returning the ballot to the voter or casting it as is.

The evaluation of the EVS 5.2.0.0 / EVS 5.2.0.1 found that the DS200 and DS850 can be programmed to query voters upon the detection of an undervote, overvote, or blank ballot. Upon detection, the voter is prompted with a message indicated the under, blank, or over vote detection and given the option to cast the ballot as is to return the ballot for modification. The testing verified that voters are queried correctly and that the selection of the voter is followed by the tabulator.

14. § 24.2-644. The voting system shall support the ability for any voter to vote for any person other than the listed candidates for the office by writing or hand printing the person's name on the official ballot.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Provide write-in blanks on all ballots (where appropriate in an election scenario).
- ✓ Correctly count and separate write-in ballots.

All ballots generated in the EVS 5.2.0.0 / EVS 5.2.0.1 have the option to include write-in candidates on one or more questions. Furthermore, ballots with write-ins votes were correctly detected, diverted, and tabulated using the DS200 firmware version 2.12.0.0 and the metal ballot box and the DS850. Write-in votes were electronically displayed using the DS200 firmware version 2.12.0.1 and the plastic ballot box.

15. § 24.2-681. The voting system shall be able to handle general and special election types in a substantively equivalent manner.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Support all election scenarios requested without undue variations to the voting operation for the election official or voter

The EVS 5.2.0.0 / EVS 5.2.0.1 supported all election scenarios requested without undue variations to the voting operation for the election official or voter.

16. § 24.2-606 -654. The voting system shall allow for the officers of election to open and close polls; and lock each voting and counting device against further voting.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Poll workers are provided a sufficient mechanism to open polls and determine the state of the device.
- ✓ Poll workers are provided a sufficient mechanism to close polls and place the device in a state such that further voting is not permitted.
- ✓ These functions are protected by sufficient access controls.

The evaluation of the EVS 5.2.0.0 / EVS 5.2.0.1 found that officers of the election are provided a secure and access-controlled mechanism to open polls and determine the state of the each device. At the close of polls, election officers are provided a mechanism to close polls and place each device in a state such that further voting is not permitted without special authorization. The opening and closing of polls on the DS200 and DS850 is limited to administrative password access only.

17. § 24.2-629. The voting system shall be capable of storing and retaining existing votes in a permanent memory in the event of power failure during and after the election.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Each device stores tabulated results such that a sudden power failure during and after an election will not erase the results.

The DS200 and DS850 store and retain existing votes on removable media as soon as each ballot is tabulated. Therefore, the evaluation showed that power failure during and after an

election does not impact the storage of the tabulated results. The DS850 also stores the tabulated results on persistent memory but requires the operator to Save Results in order to write results to the hard drive. If power is lost, any results tabulated but not saved to hard drive will be lost. All saved results are maintained.

18. § 24.2-629. The voting system shall provide an audit trail.
Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Each software module, tabulator, and supported electronic devices provides an accessible audit trail.
- ✓ Audit logs must be in human-readable form.
- ✓ Audit logs provide timestamps for all entries
- ✓ Audit logs provide entries for all privilege escalation events.
- ✓ Audit logs provide entries for all events impacting the tabulated results.
- ✓ Audit logs do not record voter identifying information or information related to the tabulated results.
- ✓ Audit logs record system or component failures

The evaluation of the EVS 5.2.0.0 / EVS 5.2.0.1 showed that each software module, tabulator, and supported device provides an accessible audit trail. Audit logs are in human-readable format and available for printing. Audit logs provide timestamps for all entries and provide entries for all events impacting the tabulated results. The audit logs evaluated do not record voter identifying information or information related to the tabulated results. Furthermore, the evaluated audit logs provide sufficient detail to indicate system or component failures.

19. § 24.2-629. The voting system shall prevent fraudulent use.
Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Each component provides physical and logical access controls.
- ✓ Each component prevents unauthorized individuals from manipulating voting system

configurations, controls, or tabulated results.

- ✓ Each component provides mechanisms for detecting fraudulent use from authorized and unauthorized actors.

The EVS 5.2.0.0 / EVS 5.2.0.1 was determined to provide a sufficient level of security controls to prevent fraudulent use when coupled with standard security and ballot accounting procedures. For example, each component provides physical and logical access controls with the ability to use tamper evident seals to detect access attempts. Each component further prevents unauthorized individuals from manipulating voting system firmware, configurations, controls, or tabulated results without the proper access credentials. In conclusion, each component provides mechanisms for detecting fraudulent use from authorized and unauthorized actors.

20. § 24.2-601. The voting system shall support the inclusion and tabulation of town office elections on general election ballots.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Ballots presented for one or more election scenarios included a town office (or equivalent).
- ✓ Town office (or equivalent) is correctly tabulated and reported with the general election.

The EVS 5.2.0.0 / EVS 5.2.0.1 demonstrated that it supports the inclusion and tabulation of town office elections on General Election ballots.

21. § 24.2-612. The voting system shall generate ballots such that only the names of candidates for offices to be voted on in a particular election district are printed on the ballots for that election district.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Generated ballots include the questions and candidates for the corresponding election district and no other.

The ballot generation capability exhibited by the EVS 5.2.0.0 / EVS 5.2.0.1 during evaluation demonstrated the ability to correctly generate ballot styles with the appropriate

offices and candidates for a specific election district.

22. § 24.2-613. The voting system shall generate ballots that comply with the guidelines for managing paper ballots found in the Virginia State Board of Elections guidance documents.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Generated ballots follow the guidance provided in the Virginia SBE guidance document (15. Managing Paper Ballots).

The ballot design capabilities provided by the EVS 5.2.0.0 / EVS 5.2.0.1 are sufficient to allow election officers to comply with the guidelines for managing paper ballots found in the Virginia State Board of Elections guidance documents.

23. § 24.2-613. The voting system shall provide ballot generation capabilities that support the ordering of the names of candidates according to § 24.2-613. Form of ballot.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Generated ballots providing the ordering of names are required

The ballot design and generation capabilities provided by the EVS 5.2.0.0 / EVS 5.2.0.1 provide election officials the ability to comply with this Virginia ballot design requirement.

24. § 24.2-613. The voting system shall provide ballot generation capabilities that support the following ballot requirement:
candidates for federal, statewide, and General Assembly offices only shall be identified by the name of his political party. (The name of the political party, the name of the "recognized political party," or term "Independent" may be shown by an initial or abbreviation to meet ballot requirements.)

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Ballots generated for one or more of the election scenarios meet this description

The ballot design and generation capabilities provided by the EVS 5.2.0.0 / EVS 5.2.0.1 provide election officials the ability to comply with this Virginia ballot design requirement.

25. **§ 24.2-613. The voting system shall provide ballot generation capabilities that support the following ballot requirement:**
    Independent candidates shall be identified by the term "Independent." The name of the political party, the name of the "recognized political party," or term "Independent" may be shown by an initial or abbreviation to meet ballot requirements.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Ballots generated for one or more of the election scenarios meet this description

The ballot design and generation capabilities provided by the EVS 5.2.0.0 / EVS 5.2.0.1 provide election officials the ability to comply with this Virginia ballot design requirement.

26. **§ 24.2-613. The voting system shall provide ballot generation capabilities that support the following ballot requirement:**
    No individual's name shall appear on the ballot more than once for the same office.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Ballots generated for one or more of the election scenarios meet this description

The ballot design and generation capabilities provided by the EVS 5.2.0.0 / EVS 5.2.0.1 provide election officials the ability to comply with this Virginia ballot design requirement.

27. **§ 24.2-613. The voting system shall provide ballot generation capabilities that support the following ballot requirement:**
    In preparing the ballots for general, special and primary elections, the electoral boards shall cause to be printed in not less than 10-point type, immediately below the title of any office, a statement of the number of candidates who may be voted for that office. The following language shall be used: "Vote for not more than ..... ".

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

✓ Ballots generated for one or more of the election scenarios meet this description

The ballot design and generation capabilities provided by the OVS Version 1.2 provide election officials the ability to comply with this Virginia ballot design requirement.

28. § 24.2-614. The voting system shall (for presidential election ballots) provide ballot generation capabilities that support the following ballot requirement:
The ballot shall contain the name of each political party and the party group name, if any, specified by the persons naming electors by petition pursuant to § 24.2-543. Below the party name in parentheses, the ballot shall contain the words "Electors for ....., President and ....., Vice President" with the blanks filled in with the names of the candidates for President and Vice President for whom the candidates for electors are expected to vote in the Electoral College.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

✓ Ballots generated for one or more of the election scenarios meet this description

The ballot design and generation capabilities provided by the EVS 5.2.0.0 / EVS 5.2.0.1 provide election officials the ability to comply with this Virginia ballot design requirement.

29. § 24.2-640. The voting system shall provide ballot generation capabilities that support the following ballot requirement:
The names of the various candidates shall be printed in type not less than fourteen point.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

✓ Ballots generated for one or more of the election scenarios meet this description

The ballot design and generation capabilities provided by the EVS 5.2.0.0 / EVS 5.2.0.1 provide election officials the ability to comply with this Virginia ballot design requirement.

30. § 24.2-615. The voting system shall provide ballot generation capabilities that support the following ballot requirement:
Ballots generated by the voting systems shall be uniform throughout the election district in which the same candidates are running to fill the same offices and throughout the district in which a question is submitted to the voters.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Ballots generated for one or more of the election scenarios meet this description

The ballot design and generation capabilities provided by the EVS 5.2.0.0 / EVS 5.2.0.1 provide election officials the ability to comply with this Virginia ballot design requirement.

31. § 24.2-640. The voting system shall provide ballot generation capabilities that support the following ballot requirement:
All candidates shall be arranged on each device or other ballot to be electronically counted, either in columns or horizontal rows, and the caption of the various ballots on the devices shall be placed so that the voter knows what feature is to be used or operated to vote for his choice.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Ballots generated for one or more of the election scenarios meet this description

The ballot design and generation capabilities provided by the EVS 5.2.0.0 / EVS 5.2.0.1 provide election officials the ability to comply with this Virginia ballot design requirement.

32. § 24.2-530. The voting system shall allow any qualified person to vote at the primary but shall prevent the person from voting for candidates of more than one party.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Primary Election scenarios shall have separate ballots for each party.
- ✓ Ballot tabulators tabulate each party's ballot separately.

The EVS 5.2.0.0 / EVS 5.2.0.1 generates separate ballots for each political party's offices and only list persons for that party. The EVS 5.2.0.0 / EVS 5.2.0.1 also tabulates and reports results for each party separately. Therefore, once a voter receives a ballot for a specific party, he is only able to cast a vote for candidates of that party.

33. § 24.2-529. The voting system shall provide ballot generation capabilities that

support the following ballot requirement:
The primary ballots for the parties taking part in a primary shall be composed, arranged, printed, delivered, and provided in the same manner as the general election ballots except that at the top of each official primary ballot shall be printed in plain black type the name of the political party and the words "Primary Election." The names of the candidates for various offices shall appear on the ballot in an order determined by the priority of the time of filing for the office. In the event two or more candidates file simultaneously, the order of filing shall then be determined by lot by the electoral board or the State Board as in the case of a tie vote for the office. No write-in shall be permitted on ballots in primary elections.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Ballots generated for one or more of the election scenarios meet this description

The ballot design and generation capabilities provided by the EVS 5.2.0.0 / EVS 5.2.0.1 provide election officials the ability to comply with this Virginia ballot design requirement for primary elections.

34. § 24.2-623. The voting system shall have a lock and key and an opening of sufficient size to admit a single folded or unfolded ballot and no more.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Physical inspection of the ballot containers confirm this attribute.
- ✓ The container has separate compartments for ballot segregation.

The ballot insertion path provided on the DS200 and DS850 tabulators were confirmed to have an opening of sufficient size to admit a single unfolded ballot and no more. Each scanner detected and rejected attempts to cast more than one ballot at a time. The ballot boxes provided with these tabulators were confirmed to have a lock and key protection for the ballot box and there was no other ballot entry path to the counted-ballots bin of the ballot box other than through the tabulator itself.

35. § 24.2-653. The voting system shall (for ballot containers paired with voting

tabulation devices) support the following handling of provisional ballots:
The voter shall then, in the presence of an officer of election, but in a secret manner, mark the ballot as provided in § 24.2-644 and seal it in the green envelope. The envelope containing the ballot shall then be placed in the ballot container by an officer of election.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Physical inspection of the ballot containers confirm this handling of provisional ballots is afforded.

The ballot boxes evaluated with the EVS 5.2.0.0 / EVS 5.2.0.1 provided a separate and secure partition of the ballot box to insert and store provisional uncounted ballots.

36. 24.2-625.2. The voting system shall not utilize wireless technology of any type with any of the voting system modules to transfer data.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ All data used in the course of the testing is transferred by means of a physical electronic device or communication medium.
- ✓ Wireless technology is disabled or removed from each voting system component.

The evaluation confirmed that no component of the EVS 5.2.0.0 / EVS 5.2.0.1 was utilizing wireless technology to transfer data.

37. § 24.2-640. The voting system shall not utilize a knob, key lever or other device to vote for any candidate other than on an individual basis except for presidential electors. (i.e. the voting system must not use straight party voting function, or have mechanism disable it and continue to perform all other functions as required)

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Straight party voting can be disabled in the election configuration.

- ✓ When disabled, the voter is unable to cast a vote for more than one candidate at a time (with the exception of presidential electors).
- ✓ Tabulation logic records only one vote per voter mark

The EVS 5.2.0.0 / EVS 5.2.0.1 has an option in the election setup to disable straight party voting. When disabled, straight party voting is not supported by any component of the voting system and the voting system complies with this requirement.

38. § 24.2-626. The voting system shall provide accessible voting capability if the voting system submitted is a Direct Recording Electronic (DRE). Otherwise, DREs are not permitted for use in Virginia.

Passed: Not Applicable **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 does not include a Direct Recording Electronic (DRE) device.

39. § 24.2-626.1. The voting system shall include provisions which allow individuals with disabilities at each polling place, including non-visual accessibility for the blind and visually impaired, to vote in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters.

Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Provides correct non-visual presentation of ballot to voter
- ✓ Provides mechanism for non-visual marking of the ballot
- ✓ Preserves the integrity of the ballot
- ✓ Correctly transcribes the voter's intent onto the ballot
- ✓ Ballots are correctly read by each precinct-count tabulator
- ✓ Various contrast ratios for visually impaired voters
- ✓ Various font sizes for visually impaired voters
- ✓ Does not require the voter to have assistance during the voting process
- ✓ Provides adjustable volume control

- ✓ Provides assistance for voters with dexterity and mobility impairments.

40. § 24.2-626.1. The voting system shall provide alternative language accessibility.
Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Multi-lingual election scenarios provide all voter facing instructions, warnings, and other presented language in Spanish.
- ✓ Accessibility provisions are supported in Spanish.

The EVS 5.2.0.0 / EVS 5.2.0.1 was evaluated for its alternative language accessibility with election scenarios from Fairfax County with English and Spanish translations on the ballot. All ballot styles were generated with both translations and were used to verify that each tabulator correctly tabulated multi-lingual ballots.

41. § 24.2-657. The voting system shall provide printed return sheets to display the tabulation results, which include the votes recorded for each office on the write in ballots and the vote on every question.
Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1 met the following condition(s) of satisfactions:

- ✓ Results reporting from individual machines and in aggregate provide the tabulated results for each candidate and option for each question for each precinct (or division of the election scenario).
- ✓ Results reporting from individual machines and in aggregate provide the number of write-ins, overvotes, and undervotes for each question for each precinct (or division of the election scenario).

Results reports provided by ballot tabulators provide the tabulation results with the numbers of write-ins and votes recorded for each office and question on the ballot.

42. § 24.2-658. The voting system shall provide (from each device) two copies printed return sheet containing the results of the election.
Passed: Yes **Anomalies Reported:** None

The EVS 5.2.0.0 / EVS 5.2.0.1met the following condition(s) of satisfactions:

- ✓ Each devices provides two copies of its tabulated results

Each device demonstrated the capability to print at least two copies of the results report. Furthermore, each device demonstrated the capability to print long (all precincts) and short (totals only) results reports.

6 Conclusions

The EVS 5.2.0.0 / EVS 5.2.0.1, presented for examination, meets the requirements of Virginia Election Laws §24.2. As the evaluation agent, I recommend the EVS 5.2.0.0 / EVS 5.2.0.1 be certified for use in the Commonwealth of Virginia.

DS200™

Precinct Scanner & Tabulator

The Next Generation of Paper-Based Vote Tabulation

ES&S' DS200™ combines the best attributes of a paper-based system with the flexibility and efficiency of a digital environment. Building on ES&S' vast experience, it incorporates best practices and customer feedback to take traditional optical scan ballot tabulation to a new level. The DS200™ is an intelligent, advance, integrated solution featuring the most advanced patented digital image technology available in the market today.

Top 5 Reasons DS200™ is the Best

Efficient: Accumulates and transmits votes directly from the polling place

Adaptable: Designed with the flexibility to process a wide range of ballot sizes and designs

Convenient: Lightweight, compact, and easy to set up and use in the polling place

Progressive: Offers extra USB ports and expandable memory to accommodate future EAC standards

Intelligent: Utilizes Intelligent Mark Recognition, eliminating the guesswork from tabulation

experience.
reliability.
security.
innovation.

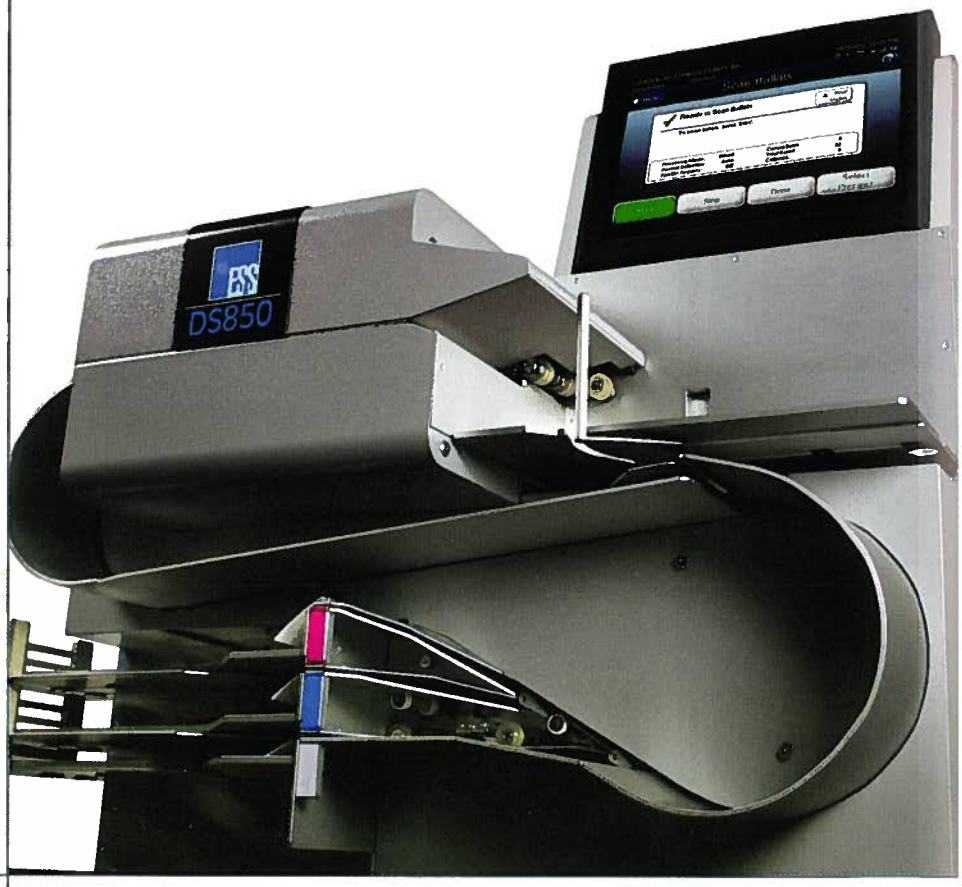
DS850™

Central Scanner & Tabulator

The Next Generation of Paper-Based Vote Tabulation

ES&S remains at the forefront of the Election Industry by continuing to provide cutting-edge digital scanners and tabulators. In 2009, we launched the DS850™ Central Tabulator to complement the DS200™ Precinct Scanner.

The DS850™ is unrivaled in speed and accuracy. Its high-speed digital imaging solution allows for smooth, continuous ballot scanning from start to finish – saving valuable time during the election process!



experience.
reliability.
security.
innovation.

ES&S

United States Election Assistance Commission

Certificate of Conformance

ES&S EVS 5.0.0.0

The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the 2005 *Voluntary Voting System Guidelines (2005 VVSG)* . Components evaluated for this certification are detailed in the attached Scope of Certification document. This certificate applies only to the specific version and release of the product in its evaluated configuration. The evaluation has been verified by the EAC in accordance with the provisions of the EAC *Voting System Testing and Certification Program Manual* and the conclusions of the testing laboratory in the test report are consistent with the evidence adduced. This certificate is not an endorsement of the product by any agency of the U.S. Government and no warranty of the product is either expressed or implied.

Product Name: EVS

Model or Version: 5.0.0.0

Name of VSTL: Wyle Laboratories

EAC Certification Number: ESSEVS5000

Date Issued: May 16, 2013

Chief Operating Officer and Acting Executive Director
U.S. Election Assistance Commission

Scope of Certification Attached

Scope of Certification

This document describes the scope of the validation and certification of the system defined above. Any use, configuration changes, revision changes, additions or subtractions from the described system are not included in this evaluation.

Significance of EAC Certification

An EAC certification is an official recognition that a voting system (in a specific configuration or configurations) has been tested to and has met an identified set of Federal voting system standards. An EAC certification is **not**:

- An endorsement of a Manufacturer, voting system, or any of the system's components.
- A Federal warranty of the voting system or any of its components.
- A determination that a voting system, when fielded, will be operated in a manner that meets all HAVA requirements.
- A substitute for State or local certification and testing.
- A determination that the system is ready for use in an election.
- A determination that any particular component of a certified system is itself certified for use outside the certified configuration.

Representation of EAC Certification

Manufacturers may not represent or imply that a voting system is certified unless it has received a Certificate of Conformance for that system. Statements regarding EAC certification in brochures, on Web sites, on displays, and in advertising/sales literature must be made solely in reference to specific systems. Any action by a Manufacturer to suggest EAC endorsement of its product or organization is strictly prohibited and may result in a Manufacturer's suspension or other action pursuant to Federal civil and criminal law.

System Overview:

ES&S EVS 5.0.0.0 is comprised of the AutoMARK Voter Assist Terminal (AutoMARK), DS200 Precinct Digital Scanner (DS200), DS850 high-speed Central Count Digital Scanner, Election Ware, Election Reporting Manager (ERM), ES&S Event Log Service, Removable Media Service (RMS) and VAT Previewer.

- AutoMARK Voter Assist Terminal enables voters who are visually or physically impaired and voters more comfortable reading or hearing instructions and choices in an alternative language to privately mark optical scan ballots. The AutoMARK supports navigation through touchscreen, physical keypad or ADA support peripheral such as a sip and puff device or two position switch.

- DS200 digital scanner is a paper ballot tabulator designed for use as a polling place scanner. After the voter makes their selections on their paper ballot, their ballot is inserted into the unit for immediate tabulation. Both sides of the ballot are scanned at the same time using a high-resolution image-scanning device that produces ballot images.
- The DS850 is a high-speed, digital scan central ballot counter that uses cameras and imaging algorithms to capture voter selections on the front and back of a ballot, evaluate results and then sort ballots into discrete bins without interrupting scanning. A dedicated audit printer generates a continuous event log. Machine level reports are produced from a second, laser printer. The scanner saves voter selections and ballot images to an internal hard disk and exports results to a USB Memory stick for processing with Election Reporting Manager.
- ElectionWare integrates the election administration functionality into a unified application. Its intended use is to define an election and create the resultant media files used by the DS200 tabulator, AutoMARK™ Voter Assist Terminal (VAT), the DS850 Central Ballot Scanner, and Election Reporting Manager (ERM). An integrated ballot viewer allows election officials to view the scanned ballot and captured ballot data side-by-side and produce ballot reports.
- 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. The ES&S Event Log Service closes any active ES&S software application if the system detects the improper deactivation of the Windows Event Viewer.
- The VAT Previewer is an application within the EMS program that allows the user to preview audio text and screen layout prior to burning Election Day media for the AutoMARK™.
- Removable Media Service (RMS) is an application that runs in the background of the EMS client workstation and supports the installation and removal of election and results media.
- Election Reporting Manager (ERM) generates paper and electronic reports for election workers, candidates, and the media. Jurisdictions can use a separate ERM installation to display updated election totals on a monitor as ballot data is tabulated, and send the results' reports directly to the media outlets.
  ERM supports accumulation and combination of ballot results data from all ES&S tabulators. Precinct and accumulated total reports provide a means to accommodate candidate and media requests for totals and are available upon demand. High-speed printers are configured as part of the system accumulation/reporting stations PC and related software.

Mark definition:

ES&S' declared level mark recognition for the DS200 and DS850 is a mark across the oval that is 0.2" long x 0.03" wide at any direction.

Tested Marking Devices:

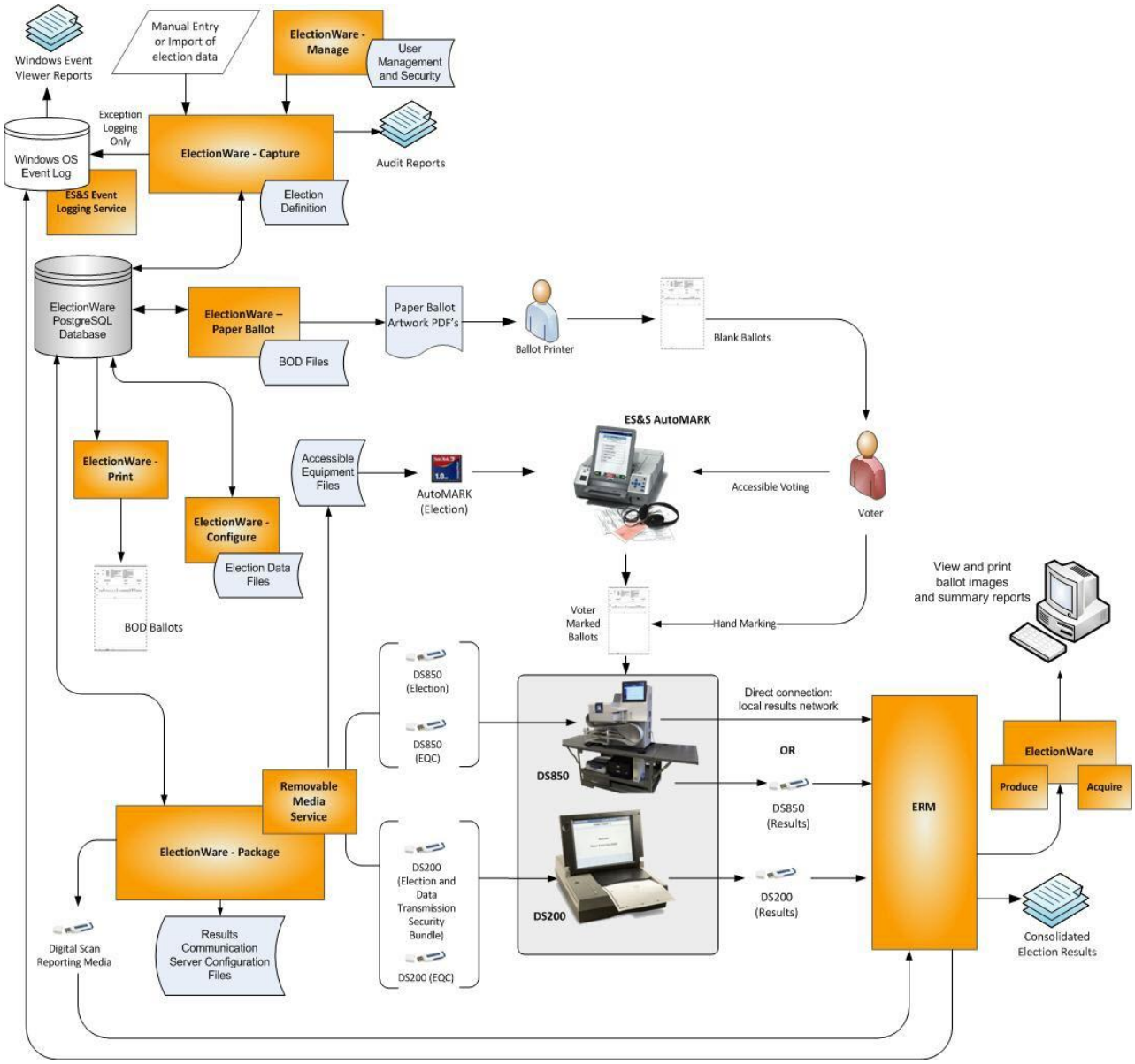
Bic Grip Roller Pen

Language capability:

EVS 5.0.0.0 supports English, Spanish, Chinese, Korean and Japanese ballot languages.

Components Included:

This section provides information describing the components and revision level of the primary components included in this Certification.



System Component	Software or Firmware Version	Hardware Version	Operating System or COTS	Comments
DS200	2.7.0.0	1.2		Precinct Digital Scanner
AutoMARK A100	1.8.1.0	1.0		ADA Ballot Marking Device
AutoMARK A200	1.8.1.0	1.1, 1.3		ADA Ballot Marking Device
AutoMARK A300	1.8.1.0	1.3		ADA Ballot Marking Device
DS850	2.4.0.0	1.0		Central Count Scanner, high-speed
Ballot Box Hardware		1.2, 1.3		Plastic ballot box
Ballot Box Hardware		1.0, 1.1, 1.2		Metal ballot box with/without diverter
Election Ware	4.1.0.0			
Election Reporting Manager (ERM)	8.6.0.0			
ES&S Event Log Service	1.5.0.0			
VAT Previewer	1.8.1.0			
Removable Media Service	1.4.0.0			
EMS Reporting Workstation		Dell Optiplex 980		
EMS Server		Dell PowerEdge T710		
EMS reporting Laptop		Dell Latitude E6410		
Ballot on Demand Printer		OKI B6300		
DS850 Report Printer		OKI B430dn		Laser report printer
DS850 Report Printer		Microline 420		Dot Matrix Printer
DS850 Audit Log		HP LaserJet 4050N		
Headphones		Avid FV-060		
USB Flash Drive		Delkin 512MB		
USB Flash Drive		Delkin 4GB		
USB Flash Drive		Delkin 8 GB		
USB Flash Drive		Delkin 1 GB		
USB Flash Drive		Delkin 2 GB		
Compact Flash		SanDisk 1.0 GB capacity & 2.0 GB capacity. Toshiba 1.0 GB capacity		

System Limitations

This table depicts the limits the system has been tested and certified to meet.

System Characteristic	Boundary or Limitation	Limiting Component
Max. precincts allowed in an election	At least 9900	ERM
Max. count for any precinct element	500,000 (65,500 from any tabulator media)	ERM report (ERM results import)
Max. candidates allowed per election	Depends on election content (limited by 21,000 maximum counters)[1]	ERM
Max. contests allowed in an election	Depends on election content (limited by 21,000 maximum counters)[2]	ERM
Max. counters allowed per precinct	Limits candidates and contests assigned to a precinct to 1,000[3]	ERM
Max. contests allowed per ballot style	200 or number of positions on ballot	N/A
Max. candidates (ballot choices) allowed per contest	175	ERM (database create)
Max. number of parties allowed	General election: 75 Primary election: 20 (including nonpartisan party)	ERM (database create)
Max. 'vote for' per contest	98	ERM (database create)
Ballot formats	All paper ballots used in an election must be the same size and contain the number of response rows.	Ballot scanning equipment
Max. Ballot Styles	9900	ERM
Max. District Types/Groups	20	ERM
Max. districts of a given type[4]	40	ERM

[1] Calculation of the number of counters must include a minimum of 4 counters for each contest, 3 overhead (overvote, undervote, precincts counted) and at least 1 candidate. Additional contest candidates each add a counter. If some precincts are defined as Absentee, a fourth overhead counter (absentee precincts counted) must be added to each contest. The number of statistical counters (Ballots Cast, Registered voters) must be added to the contest counters to determine the total counters.

[2] Example of maximum contest calculation if all contests had 2 candidates (5 counters each, 3 overhead counters + 2 candidates) and there were 10 statistical counters (i.e. Ballots Cast-Total, Republican, Democratic, Libertarian, Nonpartisan and Registered Voters-Total, Republican, Democratic, Libertarian, Nonpartisan. (21000-20)/5 = 4196 or (counter limit – statistics x 2)/number of counters/contest = number of contests.

[3] Contest counters are calculated as indicated in footnote 1, but two counters must be added for each statistical counter defined for the precinct. There are a minimum of 3 statistic counters assigned to each precinct (six added counters), "Ballots Cast," "Registered Voters" and "Ballots Cast Blank."

[4] Excludes the Precinct Group which contains all precincts.

System Characteristic	Boundary or Limitation		Limiting Component
Supported Languages	• English • Spanish • Chinese	• Korean • Japanese	System Configuration

Component Limitations:

PAPER BALLOT LIMITATIONS

1. The paper ballot code channel, which is the series of black boxes that appear between the timing track and ballot contents, limits the number of available ballot variations depending on how a jurisdiction uses this code to differentiate ballots. The code can be used to differentiate ballots using three different fields defined as: Sequence (available codes 1-26,839), Type (available codes 1-30) or Split (available codes 1-40).

2. If Sequence is used as a ballot style ID, it must be unique election-wide and the Split code will always be 1. In this case the practical style limit would be 26,000.

DS200

The ES&S DS200 configured for an early vote station does not support precinct level results reporting. An election summary report of tabulated vote totals is supported.

AUTOMARK Voter Assist Terminal

ES&S AutoMARK capacities exceed all documented limitations for the ES&S election management, vote tabulation and reporting system. For this reason, Election Management System and ballot tabulator limitations define the boundaries and capabilities of the AutoMARK system as the maximum capacities of the ES&S AutoMARK are never approached during testing

Election Ware

ElectionWare capacities exceed the boundaries and limitations documented for ES&S voting equipment and election reporting software. For this reason, ERM and ballot tabulator limitations define the boundaries and capabilities of ElectionWare system.

ELECTION REPORTING MANAGER

1. Election Reporting Manager requires a minimum monitor screen resolution of 800x600.
2. ERM Database Create allows 1600 Precincts per Ballot Style.
3. There is a limit of 3510 precincts in the precincts counted/not counted display.
4. There is a limit of 3000 precincts in the precincts counted/not counted scrolling display.

5. Contest/Precinct selection pop up display limited to 3000 contests/precincts.
6. Non-English characters are not supported in ERM. This has to do with the creation of the XML results file out of ERM.
7. ERM's maximum page size for reports is 5,000 pages.
8. Generating a District Canvass Report without first properly creating a .DST file can result in inaccurate totals reports and inconsistent report formatting.

Functionality

2005 VVSG Supported Functionality Declaration

Feature/Characteristic	Yes/No	Comment
Voter Verified Paper Audit Trails		
VVPAT	No	
Accessibility		
Forward Approach	Yes	
Parallel (Side) Approach	Yes	
Closed Primary		
Primary: Closed	Yes	
Open Primary		
Primary: Open Standard (provide definition of how supported)	Yes	
Primary: Open Blanket (provide definition of how supported)	No	
Partisan & Non-Partisan:		
Partisan & Non-Partisan: Vote for 1 of N race	Yes	
Partisan & Non-Partisan: Multi-member ("vote for N of M") board races	Yes	
Partisan & Non-Partisan: "vote for 1" race with a single candidate and write-in voting	Yes	
Partisan & Non-Partisan "vote for 1" race with no declared candidates and write-in voting	Yes	
Write-In Voting:		
Write-in Voting: System default is a voting position identified for write-ins.	Yes	
Write-in Voting: Without selecting a write in position.	Yes	
Write-in: With No Declared Candidates	Yes	
Write-in: Identification of write-ins for resolution at central count	Yes	
Primary Presidential Delegation Nominations & Slates:		
Primary Presidential Delegation Nominations: Displayed delegate slates for each presidential party	No	
Slate & Group Voting: one selection votes the slate.	No	
Ballot Rotation:		
Rotation of Names within an Office; define all supported rotation methods for location on the ballot and vote tabulation/reporting	Yes	
Straight Party Voting:		

Feature/Characteristic	Yes/No	Comment
Straight Party: A single selection for partisan races in a general election	Yes	
Straight Party: Vote for each candidate individually	Yes	
Straight Party: Modify straight party selections with crossover votes	Yes	
Straight Party: A race without a candidate for one party	Yes	
Straight Party: N of M race (where "N">1)	Yes	
Straight Party: Excludes a partisan contest from the straight party selection	Yes	
Cross-Party Endorsement:		
Cross party endorsements, multiple parties endorse one candidate.	Yes	
Split Precincts:		
Split Precincts: Multiple ballot styles	Yes	
Split Precincts: P & M system support splits with correct contests and ballot identification of each split	Yes	
Split Precincts: DRE matches voter to all applicable races.	No	
Split Precincts: Reporting of voter counts (# of voters) to the precinct split level; Reporting of vote totals is to the precinct level	Yes	It is possible to list the number of voters.
Vote N of M:	Yes	
Vote for N of M: Counts each selected candidate, if the maximum is not exceeded.	No	
Vote for N of M: Invalidates all candidates in an overvote (paper)	No	
Recall Issues, with options:		
Recall Issues with Options: Simple Yes/No with separate race/election. (Vote Yes or No Question)	Yes	
Recall Issues with Options: Retain is the first option, Replacement candidate for the second or more options (Vote 1 of M)	Yes	
Recall Issues with Options: Two contests with access to a second contest conditional upon a specific vote in contest one. (Must vote Yes to vote in 2nd contest.)	No	
Recall Issues with Options: Two contests with access to a second contest conditional upon any vote in contest one. (Must vote Yes to vote in 2nd contest.)	No	Overturned - US District Court 7/29/03: CA Election Code sect. 11383
Cumulative Voting		
Cumulative Voting: Voters are permitted to cast, as many votes as there are seats to be filled for one or more candidates. Voters are not limited to giving only one vote to a candidate. Instead, they can put multiple votes on one or more candidate.	No	
Ranked Order Voting		
Ranked Order Voting: Voters can write in a ranked vote.	No	
Ranked Order Voting: A ballot stops being counting when all ranked choices have been eliminated	No	
Ranked Order Voting: A ballot with a skipped rank counts the vote for the next rank.	No	

Feature/Characteristic	Yes/No	Comment
Ranked Order Voting: Voters rank candidates in a contest in order of choice. A candidate receiving a majority of the first choice votes wins. If no candidate receives a majority of first choice votes, the last place candidate is deleted, each ballot cast for the deleted candidate counts for the second choice candidate listed on the ballot. The process of eliminating the last place candidate and recounting the ballots continues until one candidate receives a majority of the vote	No	
Ranked Order Voting: A ballot with two choices ranked the same, stops being counted at the point of two similarly ranked choices.	No	
Ranked Order Voting: The total number of votes for two or more candidates with the least votes is less than the votes of the candidate with the next highest number of votes, the candidates with the least votes are eliminated simultaneously and their votes transferred to the next-ranked continuing candidate.	No	
Provisional or Challenged Ballots		
Provisional/Challenged Ballots: A voted provisional ballots is identified but not included in the tabulation, but can be added in the central count.	Yes	
Provisional/Challenged Ballots: A voted provisional ballots is included in the tabulation, but is identified and can be subtracted in the central count	Yes	
Provisional/Challenged Ballots: Provisional ballots maintain the secrecy of the ballot.	Yes	
Overvotes (must support for specific type of voting system)		
Overvotes: P & M: Overvote invalidates the vote. Define how overvotes are counted.	Yes	
Overvotes: DRE: Prevented from or requires correction of overvoting.	No	
Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	Yes	
Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	No	
Undervotes		
Undervotes: System counts undervotes cast for accounting purposes	Yes	
Blank Ballots		
Totally Blank Ballots: Any blank ballot alert is tested.	Yes	
Totally Blank Ballots: If blank ballots are not immediately processed, there must be a provision to recognize and accept them	Yes	
Totally Blank Ballots: If operators can access a blank ballot, there must be a provision for resolution.	Yes	
Networking		
Wide Area Network – Use of Modems	No	
Wide Area Network – Use of Wireless	No	
Local Area Network – Use of TCP/IP	No	
Local Area Network – Use of Infrared	No	
Local Area Network – Use of Wireless	No	
FIPS 140-2 validated cryptographic module	No	
Used as (if applicable):		

Feature/Characteristic	Yes/No	Comment
Precinct counting device	Yes	DS200
Central counting device	Yes	DS850

Baseline Certification Engineering Change Order's (ECO)

This table depicts the ECO's certified with the voting system:

Change ID	Date	Component	Description	Inclusion
872	6/25/12	DS200/DS850	Release a new 4 GB USB thumb drive	De Minimis Optional
873	6/25/12	DS200/DS850	Release a new 8 GB USB thumb drive	De Minimis Optional
875	6/25/12	AutoMARK	Release 1GB Compact Flash	De Minimis Optional
876	11/10/11	AutoMARK	Redefine AutoMARK hardware revision level	De Minimis Optional
878	6/25/12	AutoMARK	End of Life AutoMARK components	De Minimis Optional
881	8/31/12	DS200/DS850	Allow color housing on 1gb, 2gb, 4gb and 8gb USB drives	De Minimis Optional
882	10/26/12	DS200/DS850	Introduce Delkin 1gb & 2gb USB drives	De Minimis Optional
884	8/31/12	DS200	Add rubber gasket for steel ballot box	De Minimis Optional
1029	8/31/12	DS200/DS850	Introduce new delkin compact flash	De Minimis Optional
1160	4/12/13	DS200	Counterfeit Sensor is end of life.	De Minimis Optional
1266	5/2/13	DS200 Carry Case	Improve DS200 Carry Case Latch Bracket	De Minimis Optional
1346	3/7/13	DS200	Change intElect logo to ESS	De Minimis Optional
1351	5/2/13	DS200 Carry Case	DS200 Carry Case replace cross recess screws with Torx head screws	De Minimis Optional
1388	5/2/13	DS200 Carry Case	Add a hinge reinforcement bracket to the DS200 carry case	De Minimis Optional

Wyle Laboratories, Inc.
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TEST REPORT

REPORT NO.: T59087.01-01 Rev A

WYLE JOB NO.: T59087.01

CLIENT P.O. NO.: ES&S-MSA-TA017

CONTRACT: N/A

TOTAL PAGES (INCLUDING COVER): 1486

DATE: 5/1/2013

NATIONAL CERTIFICATION TEST REPORT
FOR
CERTIFICATION TESTING
OF THE
ELECTION SYSTEMS & SOFTWARE
EVS 5.0.0.0 VOTING SYSTEM

for

Election Systems & Software, LLC
11208 John Galt Blvd.
Omaha, NE 68137-2364

STATE OF ALABAMA
COUNTY OF MADISON }

Robert D. Hardy, Department Manager, being duly sworn, deposes and says: The information contained in this report is the result of complete and carefully conducted testing and is to the best of his knowledge true and correct in all respects.

Robert Hardy

SEAL

SUBSCRIBED and sworn to before me this 1 day of May 20 13

Sandra A. Klamel
Notary Public in and for the State of Alabama at Large

My Commission expires June 2, 2015

Wyle shall have no liability for damages of any kind to person or property, including special or consequential damages, resulting from Wyle's providing the services covered by this report.

PREPARED BY: Stephen H 5-1-13
Stephen Han, Project Engineer — Date

APPROVED BY: Frank Padilla 5-1-13
Frank Padilla, Voting Systems Manager — Date

WYLE Q. A.: Terceno 5/1/13
Raul Terceno, Q. A. Manager — Date

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U.S. Election Assistance Commission
VSTL
EAC Lab Code 0704

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1.0 INTRODUCTION

1.1 Scope

This report presents the test results for a full certification testing campaign of the Election Systems & Software (ES&S) EVS 5.0.0.0 voting system. The primary purpose of Certification Testing was to demonstrate that the system meets or exceeds the requirements of the Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (VVSG). The certification test procedure was intended to discover non-conformities to the EAC 2005 VVSG for system operations which, should they occur in actual election use, could result in failure to complete election operations in a satisfactory manner. The tests were also intended to demonstrate system compliance with levels of design, performance, and quality claimed by the manufacturer.

This report is valid only for the system identified in Section 2 of this report. Any changes, revisions, or corrections made to the system after this evaluation shall be submitted to the EAC to determine if the modified system requires a new application, or can be submitted as a modified system. The scope of testing required will be determined based upon the degree of modification.

1.2 Objective

The objective of this test program was to ensure that the ES&S EVS 5.0.0.0 complied with the hardware and software requirements of the EAC 2005 VVSG. The scope and detail of the requirements tested in certification were selected to correspond to the design and complexity of the system submitted by ES&S for testing. The examination included focused in-depth examination of the voting system, the inspection and evaluation of system documentation and execution of functional tests to verify system performance and function under normal and abnormal conditions.

1.3 Test Report Overview

This test report consists of four main sections and appendices:

- 1.0 Introduction – Provides: the architecture of the National Certification Test Report (hereafter referred to as Test Report), a brief overview of the testing scope of the Test Report, a list of documentation, customer information, and references applicable to the voting system hardware, software, and this test report.
- 2.0 System Identification – Provides information about the system tested that includes the system name and major subsystems, test support hardware, and specific documentation provided by the vendor used to support testing.
- 3.0 Test Background – Contains information about the certification test process and a list of terms and nomenclature pertinent to the Test Report and system tested.
- 4.0 Test Procedures and Results – Provides a summary of the results of the testing process.
- Appendices– Information supporting reviews and testing of the voting system are included as appendices to this report. These includes: Notices of Anomaly, Hardware Test Report, Functional Configuration Audit Test Case Procedure Specification, Security Test Case Procedure Specification, Usability Test Case Procedure Specification, Election Definitions, Technical Data Package Review Report, Source Code Review Report, Physical Configuration Audit Report, Security Assessment Report, Deficiency Report, Summative Usability Report, Warrant of Accepting Change Control responsibility letter; Witnessed Build, as-run Certification Test Plan, Requirement Matrix, Conformity Statement, and Attestation of Durability.

1.0 INTRODUCTION (Continued)

1.4 Customer

Election Systems & Software, LLC
11208 John Galt Blvd.
Omaha, NE 68137-2364

1.5 References

The documents listed were utilized to perform testing.

- 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, effective date January 1, 2007
- Election Assistance Commission Voting System Test laboratory Program Manual, Version 1.0, effective date July 2008
- 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
- Wyle Laboratories' Test Guidelines Documents: EMI-001A, "Wyle Laboratories' 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"
- Wyle Laboratories' 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 and Notices of Clarification (listed on www.eac.gov)

A listing of the EVS 5.0.0.0 Voting System Technical Data Package (TDP) Documents submitted for this test effort is listed in Section 2.5, "Vendor Technical Data Package,"

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW

2.1 System Overview

The ES&S EVS 5.0.0.0 Voting System is a paper-based, digital scan voting system. The EVS 5.0.0.0 Voting System hardware consists of five major components:

1. Election Management System (EMS) Server
2. Election Management System (EMS) client (desktop and/or laptop) with Election Reporting Manager (ERM)
3. Polling Place Scanner – DS200
4. Polling Place American Disability Act (ADA) Devices – AutoMARK A100, AutoMARK A200, and AutoMARK A300
5. Central Count Digital Scanner – DS850

The following paragraphs describe the design and structure of the EVS 5.0.0.0 Voting System as taken from the ES&S Technical Documentation.

2.1.1 System Hardware

Precinct Ballot Tabulator: DS200

The precinct ballot tabulator component is the DS200. The DS200 is a digital scan paper ballot tabulator designed for use at the polling place level. After the voter marks a paper ballot, their ballot is inserted into the unit and immediately tabulated. The tabulator uses a high-resolution image-scanning device to image the front and back of the ballot simultaneously. The resulting ballot images are then processed by a proprietary mark recognition engine.

The system includes a 12-inch touch screen display providing voter feedback and poll worker messaging. Once a ballot is tabulated and the system creates cast vote records, the ballot is dropped into an integrated ballot box. The DS200 includes an internal thermal printer for the printing of the zero reports, log reports, and polling place totals upon the official closing of the polls.

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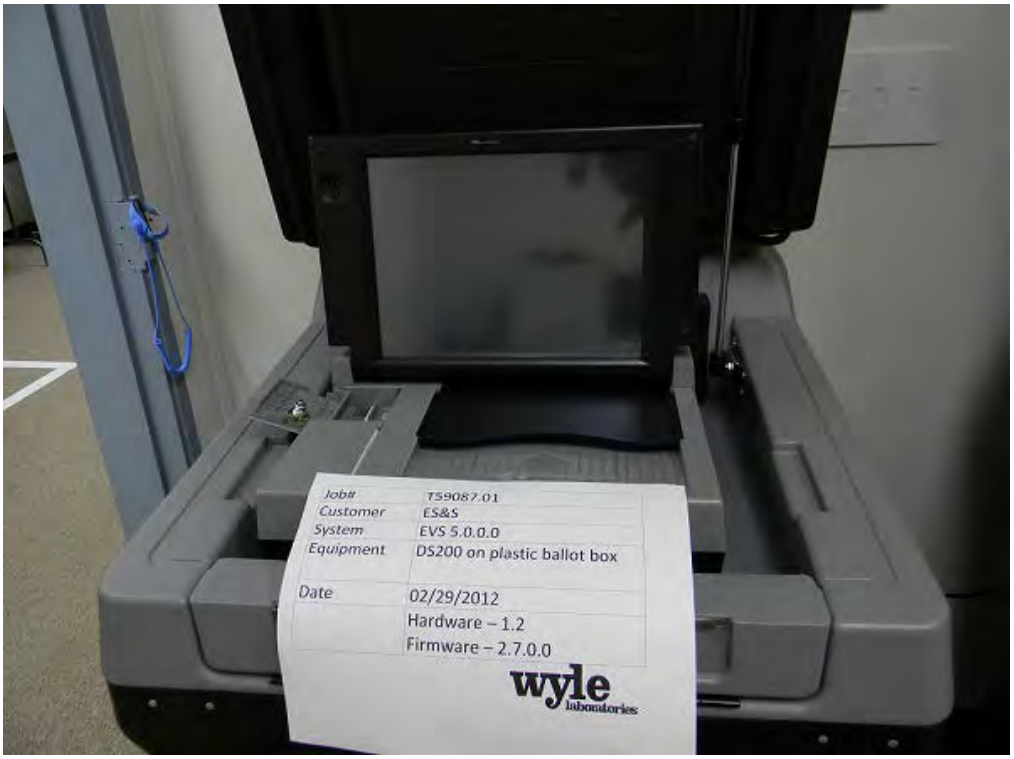

Photograph No. 1: DS200 (on plastic ballot box)

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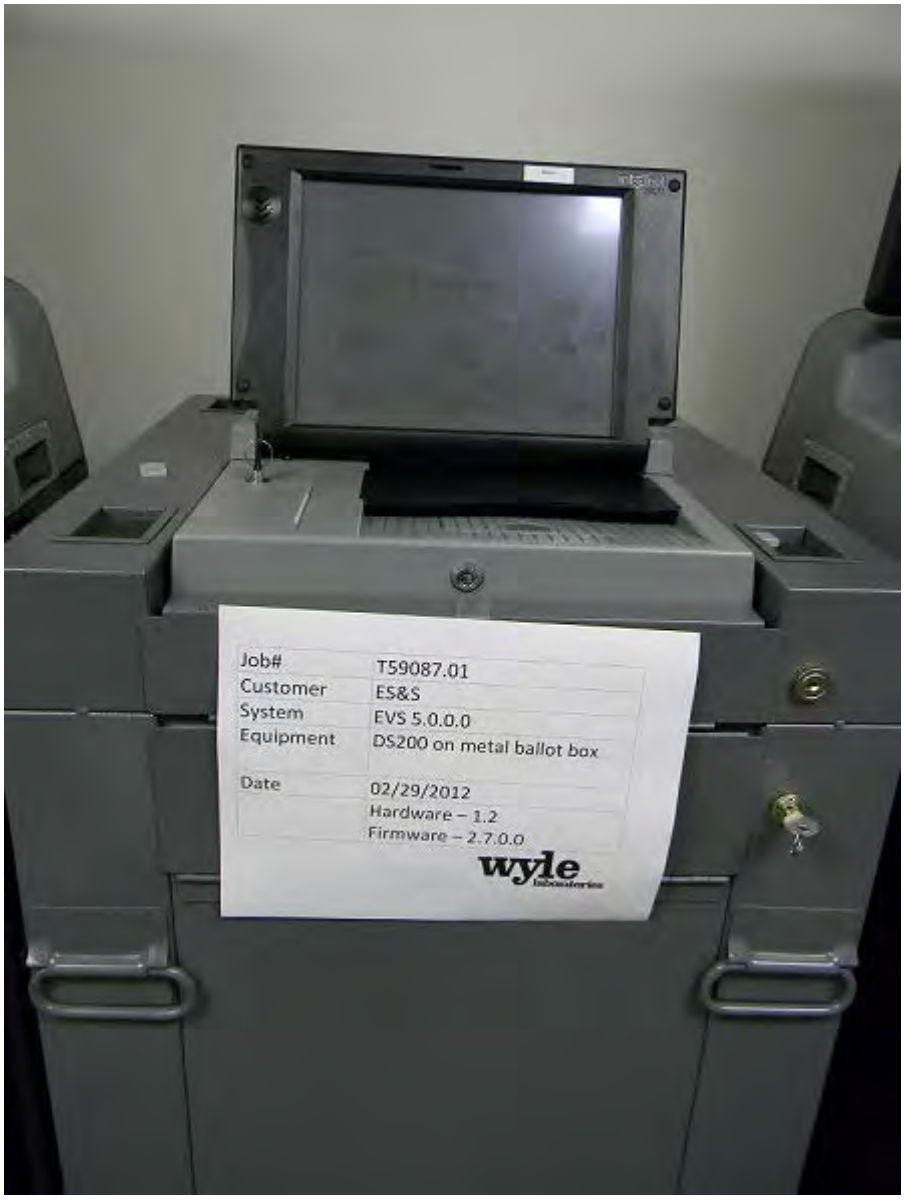

Photograph No. 2: DS200 (on metal ballot box)

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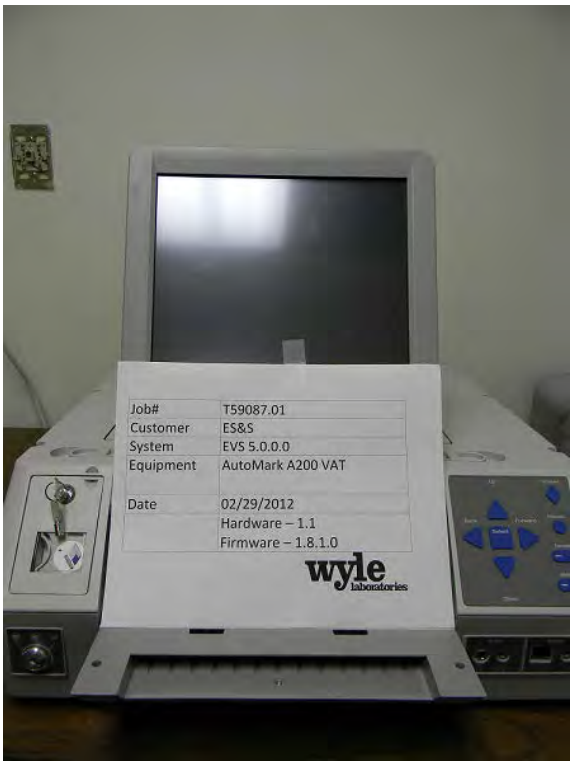
Electronic Ballot Marking Device: AutoMARK™ Voter Assist Terminal (VAT)

The electronic ballot marking device component is the ES&S AutoMARK™ Voter Assist Terminal (VAT). The AutoMARK™ VAT assists voters with disabilities by marking optical scan ballots.

The AutoMARK™ VAT includes two user interfaces to accommodate voters who are visually or physically impaired or voters who are more comfortable reading or hearing instructions and choices in an alternative language. The AutoMARK™ is equipped with a touch-screen and keypad. The touch-screen interface includes various colors and effects to prompt and guide the voter through the ballot marking process. Each key has both Braille and printed text labels designed to indicate function and a related shape to help the voter determine its use.

Regardless whether the voter uses the touch-screen or other audio interface, changes can be made throughout the voting process by navigating back to the appropriate screen and selecting the change or altering selections at the mandatory vote summary screen that closes the ballot-marking session.

The A100, A200 and A300 all operate the same and have the same features. The difference between the models is the location of two printed circuit boards and related wiring harness and cables. In the A200, the Printer Engine Board and Power Supply Board were moved from under the machine to the top. The A300 has a different lock and label. Since this change is so minor, the A300 equipment was only tested in the Accuracy and System Integration Tests. Therefore, the A300 is included in the recommendation for certification.



Photograph No. 3: AutoMARK™ A200 VAT

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Photograph No. 4: AutoMARK™ A100 VAT

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Tabulator: DS850

The DS850 is a high-speed, digital scan central ballot counter. During scanning, the DS850 prints a continuous audit log to a dedicated audit log printer and can print results directly from the scanner to a second connected printer. The scanner saves results internally and to results collection media that officials can use to format and print results from a PC running Election Reporting Manager. The DS850 has an optimum throughput rate of 300 ballots per minute and uses cameras and imaging algorithms to image the front and back of a ballot, evaluate the results and sort ballots into discrete bins to maintain continuous scanning.

Photograph No. 5: DS850

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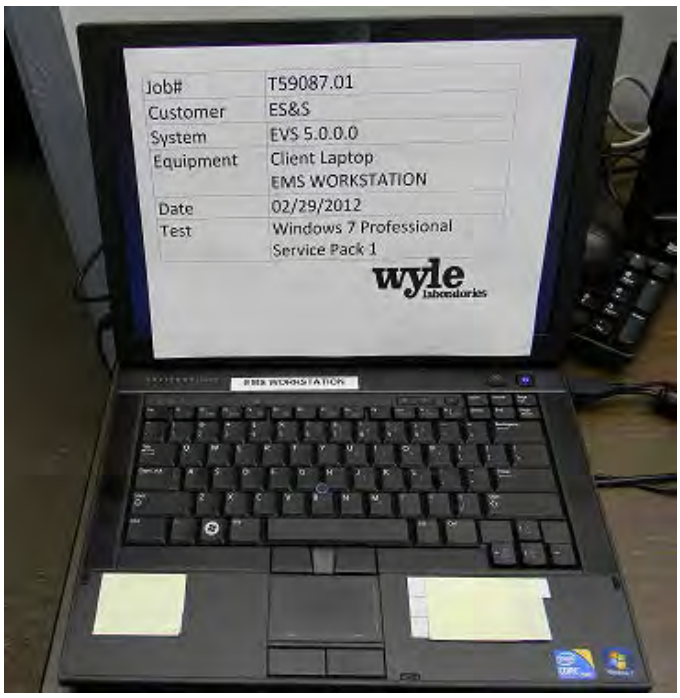
EMS Client Server Configuration

EVS 5.0.0.0 Voting System Election Management System (EMS) was configured with a Server running Windows Server 2008 R2 and a combination of a client laptop and a client desktop running Windows 7 Professional.

Photograph No. 6: EMS Server



Photograph No. 7: EMS Client Laptop

Photograph No. 8: EMS Client Desktop

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2.1.2 System Software

The EVS 5.0.0.0 Voting System EMS is an application suite comprised of five components: ElectionWare, Election Reporting Manager (ERM), Removable Media Service (RMS), ES&S Event Logging Service (UELS), and VAT Previewer.

ElectionWare

ElectionWare integrates the election administration functionality into a unified application. Its intended use is to define an election and create the resultant media files used by the DS200 tabulator, AutoMARK Voter Assist Terminal (VAT), the DS850 Central Ballot Scanner, and Election Reporting Manager (ERM). An integrated ballot viewer allows election officials to view the scanned ballot and captured ballot data side-by-side and produce ballot reports.

Election Reporting Manager (ERM)

Election Reporting Manager (ERM) generates paper and electronic reports for election workers, candidates, and the media. Jurisdictions can use a separate ERM installation to display updated election totals on a monitor as ballot data is tabulated, and send the results' reports directly to the media outlets.

ERM supports accumulation and combination of ballot results data from all ES&S tabulators. Precinct and accumulated total reports provide a means to accommodate candidate and media requests for totals and are available upon demand. High-speed printers are configured as part of the system accumulation/reporting stations PC and related software.

Removable Media Service (RMS)

Removable Media Service (RMS) is an application that runs in the background of the EMS client workstation and supports the insertion and removal of election and results USB media.

ES&S Event Logging Service (UELS)

ES&S Event Logging Service leverages the Windows Event Viewer, included with a standard Windows installation, to audit user interactions with the ES&S Election Management System.

VAT Previewer

The VAT Previewer is an application within the EMS program that allows the user to preview audio text and screen layout prior to burning Election Day media for the AutoMARK.

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2.1.3 System Operational Concept

The operational flow and low-level system interfaces for the EVS 5.0.0.0 Voting System is illustrated in Figure 1-1.

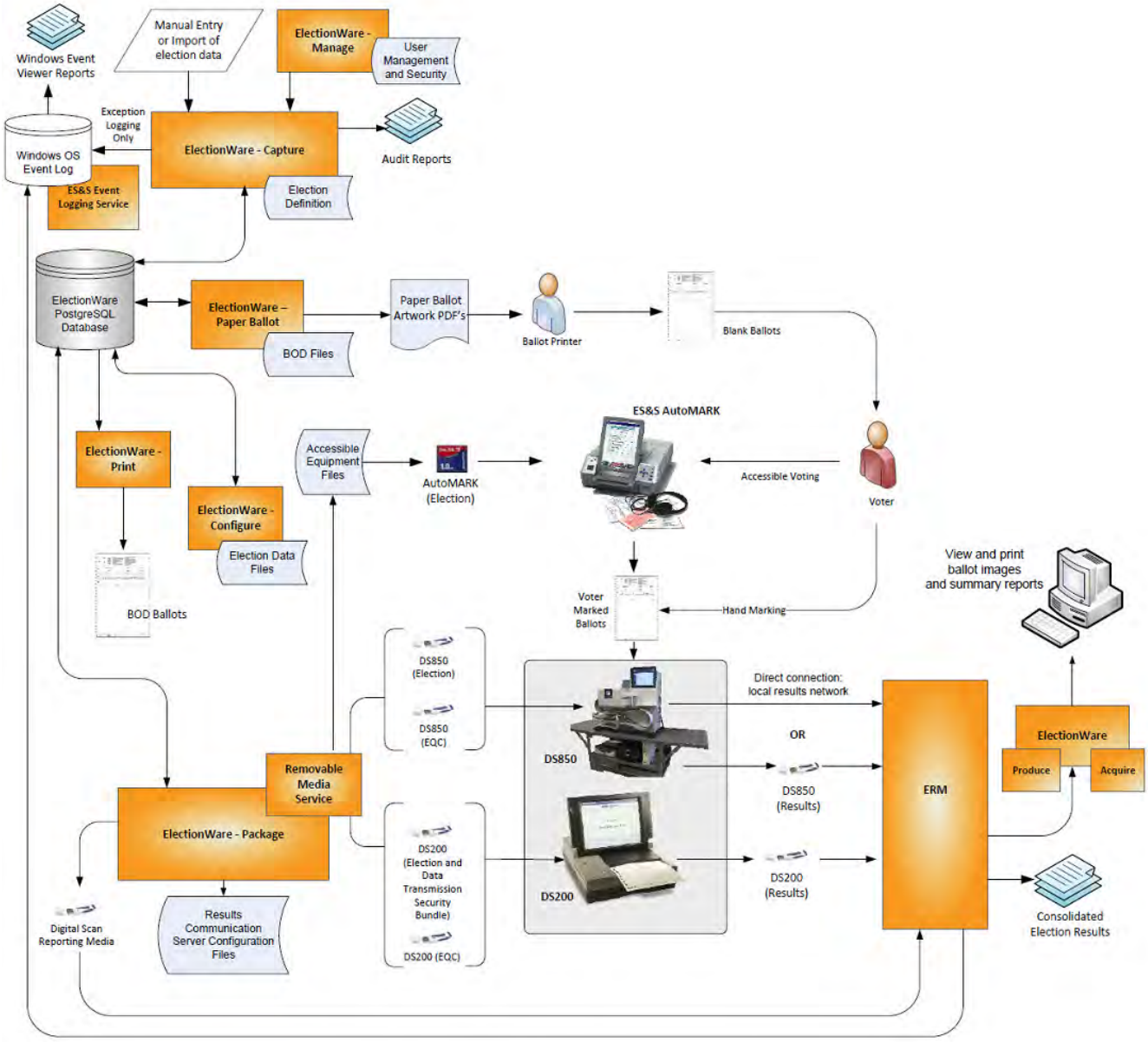

Figure 1-1 System Overview Diagram

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.2 Software

This section defines the two types of software required for testing: software used for the testing of hardware, software, security and system integration; and supporting software required for the test environment (operating systems, compliers, assemblers, database managers, and any other supporting software). All COTS third-party software was downloaded or retrieved by Wyle qualified personnel. These products were verified not to have been modified and were built into the EVS 5.0.0.0 for the entire test campaign. Wyle believes these components to have proven performance in other commercial applications. Both COTS and non-COTS software components are listed in this section.

Table 2-1 EVS 5.0.0.0 EMS Software Platform Component Descriptions

Software Required For Testing	Software Version
ElectionWare	4.1.0.0
Election Reporting Manager (ERM)	8.6.0.0
ES&S Event Logging Service	1.5.0.0
VAT Previewer	1.8.1.0
Removable Media Service	1.4.0.0

Table 2-2 EVS 5.0.0.0 EMS COTS Software Platform Component Descriptions

Software Required For Testing	Description
Windows 7 Professional, with SP1	Original Disk
Windows Server 2008 R2, with SP2	Original Disk
Adobe Acrobat Standard version 9.0 or better	Original Disk
RM/Cobol	12.06
Microsoft Office Excel 2007 or better	Original Disk

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Hardware

The system submitted by ES&S for certification testing consisted of the following hardware, firmware, and software source code components.

Table 2-3 EVS 5.0.0.0 Voting System Equipment Description

Equipment	Manufacturer	Version/Model	Specifications	Serial Number
EMS Client Laptop	Dell	Latitude E6410	Intel Core i5 CPU M580 @ 2.67GHz 4.00 GB Installed RAM HD Capacity 250 GB	2FD65Q1
EMS Server	Dell	T710	Intel Xeon CPU E5645 @ 2.40GHz (2 processors), 12.0 GB Installed RAM HD Capacity 300 GB	JPZ6VR1
EMS Client Desktop	Dell	OptiPlex 980	Intel Core i5 CPU 650 @ 3.20 GHz 4.0 GB Installed RAM HD Capacity 320 GB	3TZJFQ1

Table 2-4 Build Machine Description

Equipment	Manufacturer	Version/Model	Serial Number	COTS/ Non-COTS
Build 1	Dell OptiPlex 760	Processor: Intel Duo Core E8400 Wolfdale Memory: 4x 1GB, 800 MHz Ram Hard Drive Capacity: 80 GB	6D7DJG1	COTS
Build 2	Dell OptiPlex 760	Processor: Intel Duo Core E8400 Wolfdale Memory: 4x 1GB, 800 MHz Ram Hard Drive Capacity: 80 GB	6DCKJG1	COTS
Build 3	Dell Precision T3500	Processor: Intel X5650 2.66/6.4 12MB Xeon Westmere Memory: 1x 2GB, 1333 MHz Ram Hard Drive Capacity: 160 GB	15TMMN1	COTS
Build 4	Dell Precision T3500	Processor: Intel X5650 2.66/6.4 12MB Xeon Westmere Memory: 1x 2GB, 1333 MHz Ram Hard Drive Capacity: 160 GB	15TNMN1	COTS

Table 2-5 EVS 5.0.0.0 Voting System Equipment

Equipment	Description	Serial Numbers
AutoMARK	Voting Assist Terminal (A100)	AM0106421217
AutoMARK	Voting Assist Terminal (A100)	AM0106431607
AutoMARK	Voting Assist Terminal (A200)	AM0106431648
AutoMARK	Voting Assist Terminal (A200)	AM0206442952
AutoMARK	Voting Assist Terminal (A200)	AM0206443671
AutoMARK	Voting Assist Terminal (A200)	AM0206443734

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.3 Hardware (Continued)

Table 2-5 EVS 5.0.0.0 Voting System Equipment (Continued)

Equipment	Description	Serial Numbers
AutoMARK	Voting Assist Terminal (A200)	AM0208470626
AutoMARK	Voting Assist Terminal (A200)	AM0208470638
AutoMARK	Voting Assist Terminal (A200)	AM0208470705
AutoMARK	Voting Assist Terminal (A200)	AM0208470828
AutoMARK	Voting Assist Terminal (A300)	AM0307420270
AutoMARK	Voting Assist Terminal (A300)	AM0307430730
AutoMARK	Voting Assist Terminal (A300)	AM0307431421
AutoMARK	Voting Assist Terminal (A300)	AM0308421809
DS200	Precinct Count Digital Scanner	DS0110340034
DS200	Precinct Count Digital Scanner	DS0110340480
DS200	Precinct Count Digital Scanner	ES0108330100
DS200	Precinct Count Digital Scanner	ES0108340085
DS200	Precinct Count Digital Scanner	ES0108340579
DS850	Central Count Digital Scanner	DS8509420009
DS850	Central Count Digital Scanner	DS8509420037
DS850	Central Count Digital Scanner	DS8511090074
DS850	Central Count Digital Scanner	DS8511090075
Ballot Box Hardware v. 1.2,1.3	Plastic Ballot Box	E076, E089, E099, T59087-Box 2, T59087-Box 3, T59087-Box 5
Ballot Box Hardware v. 1.0,1.1,1.2	Metal Box with Diverter	E015, E017, T59087 –Metal Box-12, T59087 – Metal Box-13

2.4 Test Tools/Materials

This subsection enumerates any and all test materials needed to perform voter system testing. The scope of testing determines the quantity of a specific material required.

The following test materials are required to support the EVS 5.0.0.0 certification testing:

Table 2-6 Test Support Materials

Test Material	Quantity	Make	Model
Ballot on Demand Printer	1	OKI Data	C9650
8 ½” X 11” Paper in Speed Loading Box (2700 Sheets)	4	Dot Matrix	951027
Security Seals	5000	Intab	800-0038R

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.4 Test Tools/Materials (Continued)

Table 2-6 Test Support Materials (Continued)

Test Material	Quantity	Make	Model
Security Locks	20	E. J. Brooks	86022
	25	E. J. Brooks	6024
	50	American Casting Corp.	00561-03
ES&S Pens	20	BIC	Grip Roller
Ethernet Switch	1	Dell	HNC67M1
Security Sleeves	7	ES&S	PS-S7-936
CF Card Reader	1	SanDisk	018-6305
Magnifier	3	---	---
Blue Security Ballot Storage/Transport Box	2	---	---
Headphone Covers	30	---	---
Paddles (yes/no)	3	---	---
Transport Media (USB Flash Drives)	5	Delkin	512 MB Capacity
	10	Delkin	1.0 GB Capacity
	5	Delkin	2.0 GB Capacity
	75	Delkin	4.0 GB Capacity
	5	Delkin	8.0 GB Capacity
Compact Flash	10	SanDisk	1.0 GB Capacity
	10	SanDisk	2.0 GB Capacity
	10	Toshiba	1.0 GB Capacity

2.5 Vendor Technical Data Package

The Technical Data Package (TDP) contains information about requirements, design, configuration management, quality assurance, and system operations. The EAC 2005 VVSG requirements state that, at a minimum, the TDP shall contain the following documentation: system configuration overview; system functionality description; system hardware specifications; software design and specifications; system test and verification specifications; system security specifications; user/system operations procedures; system maintenance procedures; personnel deployment and training requirements; configuration management plan; quality assurance program; and system change notes.

The documents listed in Table 2-7 comprise the EVS 5.0.0.0 Voting System TDP:

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.5 Vendor Technical Data Package (Continued)

Table 2-7 EVS 5.0.0.0 Voting System TDP

EVS 5.0.0.0 TDP Documents	Version	Doc. No.	Document Code
Voting System Overview	15.0	01-01	EVS5000_OVR00
System Functionality Description			
System Functionality Description – Voting System	8.0	02-01	EVS5000_SFD00
System Hardware Specification			
System Hardware Specification – DS850	3.0	03-01	EVS5000_SHS00_DS850
System Hardware Specification – DS200	2.0	03-02	EVS5000_SHS00_DS200
AutoMARK™ System Hardware Overview	5.0	03-04	AutoMARK™_ESS_System_Hardware_Overview_AQS-18-5002-000-S
AutoMARK™ System Hardware Specification	5.0	03-05	AutoMARK™_ESS_System_Hardware_Specification_AQS-18-5000-001-F
Software Design and Specification			
Software Design and Specification – ES&S Event Logging Service	1.0	04-01	EVS5000_SDS00_UELS
Software Design and Specification - ElectionWare	7.0	04-02	EVS5000_SDS00_ElectionWare
Software Design and Specification – ERM	3.0	04-03	EVS5000_SDS00_ERM
Software Design and Specification – DS850	10.0	04-04	EVS5000_SDS00_DS850
Software Design and Specification – DS200	7.0	04-05	EVS5000_SDS00_DS200
Software Design and Specification – AutoMARK™	1.8	04-06	EVS5000_SDS00_AutoMARK™ SDS Overview
System Development Program	1.0	04-07	ESSSYS_SG_P_1000_SystemDevProgram
ES&S Standards and Procedure Coding Standards	1.0	04-08	ESSSYS_D_D_0100_Coding Standards
System Test/Verification Specification			
Voting System Test Plan	4.0	05-01	EVS5000_STP00
Test Cases - ElectionWare: Manage	4.1.0.0	05-02	EVS5000_TC00_ElectionWare01_Manage
Test Cases - ElectionWare: Define	4.1.0.0	05-03	EVS5000_TC00_ElectionWare02_Define
Test Cases - ElectionWare: Design	3.3	05-04	EVS5000_TC00_Electionware03_Design
Test Cases - ElectionWare: Deliver	4.1.0.0	05-05	EVS5000_TC00_Electionware04_Deliver
Test Cases - ElectionWare: Resolve	4.2.0.0	05-06	EVS5000_TC00_Electionware05_Resolve
Test Cases - ERM	8.6.0.0	05-07	EVS5000_TC00_ERM
Test Cases - DS850	2.4.0.0	05-08	EVS5000_TC00_DS850
Test Cases - DS200	2.7.0.0	05-09	EVS5000_TC00_DS200
Test Cases - AutoMARK™	1.8.1.0	05-10	EVS5000_TC00_AutoMARK™

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.5 Vendor Technical Data Package (Continued)

Table 2-7 EVS 5.0.0.0 Voting System TDP (Continued)

EVS 5.0.0.0 TDP Documents	Version	Doc. No.	Document Code
System Security Specification			
System Security Specification	3.1	06-01	EVS5000_SSS00
AutoMARK™ System Security Specifications	6.0	06-02	AutoMARK™ ESS System Security Specification AQS-18-5002-001-S
System Operations Procedure			
System Operations Procedures - UELS	1.0	07-01	EVS5000_SOP00_ELS
User's Guide- ElectionWare Admin	4.8	07-02	EVS5000_SOP00_ElectionWare02_Admin
User's Guide- ElectionWare Define	4.0	07-03	EVS5000_SOP00_ElectionWare02_Define
User's Guide - ElectionWare Design	3.2	07-04	EVS5000_SOP00_ElectionWare03_Design
User's Guide - ElectionWare Deliver	5.6	07-05	EVS5000_SOP00_ElectionWare04_Deliver
User's Guide - ElectionWare Results	1.5	07-06	EVS5000_SOP00_ElectionWare05_Results
User's Guide - ERM	8.6	07-07	EVS5000_SOP00_ERM
Operator's Guide - DS850	11.4	07-08	EVS5000_SOP00_DS850
Operator's Guide - DS200	10.1	07-09	EVS5000_SOP00_DS200
System Operations Procedures - AutoMARK™	5.0	07-10	EVS5000_SOP00_AMVAT
Network Configuration Guide	3.1	07-12	EVS5000_SOP00_NetworkConfigGuide
System Maintenance Manuals			
Maintenance Guide- DS850	3.1	08-01	EVS5000_SMM00_DS850
Maintenance Guide- DS200	3.1	08-02	EVS5000_SMM00_DS200
Maintenance Guide- AutoMARK™	4.0	08-03	EVS5000_SMM00_AMVAT
Personnel Deployment and Training			
Personnel Deployment and Training Program	1.0	09-01	ESSSYS_T_D_1000_TrainingProgram
Configuration Management Plan			
ES&S Configuration Management Program	1.0	10-1	ESSSYS_CM_P_1000_ESSCMProgram
CM Plan Appendices	---	10-2	Multiple Documents
QA Program			
Manufacturing Quality Assurance Plan	1.0	11-01	ESSSYS_M_P_1000_MNFQualityAssurancePlan
Engineering Change Order Process	1.0	11-02	ESSSYS_M_P_0500_ECOProcess
Software Quality Assurance Program	1.0	11-03	ESSSYS_Q_P_0100_SoftwareQualityAssuranceProgram
Other TDP Documents			
ES&S Ballot Production Guide	4.0	13-01	U3400R1_ORPT02_BallotProductionGuide

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.6 Deliverable Materials

The materials listed on Table 2-8 are identified by ES&S to be delivered as part of the EVS 5.0.0.0 Voting System to the end users.

Table 2-8 EVS 5.0.0.0 Voting System Deliverables

Deliverable Material	Version	Description
ERM	8.6.0.0	EMS
ElectionWare	4.1.0.0	EMS
ES&S Event Logging Service	1.5.0.0	EMS
Removable Media Services	1.4.0.0	EMS
VAT Previewer	1.8.1.0	EMS
DS200	Firmware 2.7.0.0; Hardware 1.2	Precinct ballot scanner
AutoMARK™ A100	Firmware 1.8.1.0; Hardware 1.0	Voter Assist Terminal
AutoMARK™ A200	Firmware 1.8.1.0; Hardware 1.1, 1.3	Voter Assist Terminal
AutoMARK™ A300	Firmware 1.8.1.0; Hardware 1.3	Voter Assist Terminal
DS850	Firmware 2.4.0.0; Hardware 1.0	Central ballot scanner
OKI Printer	B430dn, B431dn	Laser Report Printer
OKI Printer	Microline 420	Dot Matrix Printer
Headphones	Avid FV 60	Stereo headphones
Voting System Overview EVS 5.0.0.0	15.0	TDP Document
ES&S ElectionWare 4.1 Vol. I: Administrator's Guide	4.8	TDP Document
ES&S ElectionWare 4.1 Vol. II: Define User's Guide	3.8	TDP Document
ES&S ElectionWare 4.1 Vol. III: Design User's Guide	3.2	TDP Document
ES&S ElectionWare 4.1 Vol. IV: Deliver User's Guide	5.6	TDP Document
ES&S ElectionWare 4.1 Vol. V: Results User's Guide	1.5	TDP Document
ES&S DS200 System Operations Procedures	10.1	TDP Document
ES&S DS850 System Operations Procedures	2.4	TDP Document
AutoMARK™ system Operations Procedures	5.0	TDP Document
ES&S ERM System Operations Procedures	8.6	TDP Document
Network Configuration Guide	3.1	TDP Document
EVS Event Logging Service System Operations Procedures	1.0	TDP Document
Voting System Security Specification EVS 5.0.0.0	3.1	TDP Document
Jurisdiction Security Practices Template	1.0.0.1	TDP Document
Hardening the EMS PC Guide	4.0	TDP Document

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.7 End User Documentation

The following documents constitute the deliverables to the end user at election central:

- Voting System Overview EVS 5.0.0.0, Version 15.0
- ES&S ElectionWare 4.1 Vol. I: Administrator's Guide, Revision 4.8
- ES&S ElectionWare 4.1 Vol. II: Define User's Guide, Revision 4.0
- ES&S ElectionWare 4.1 Vol. III: Design User's Guide, Revision 3.2
- ES&S ElectionWare 4.1 Vol. IV: Deliver User's Guide, Revision 5.6
- ES&S ElectionWare 4.1 Vol. V: Results User's Guide, Revision 1.5
- ES&S DS200 System Operations Procedures, Revision 10.1
- ES&S DS850 System Operations Procedures, Revision 2.4
- AutoMARK™ System Operations Procedures, Revision 5.0
- ES&S ERM System Operations Procedures, Revision 13.1
- Network Configuration Guide, Revision 3.1
- EVS Event Logging Service System Operations Procedures, Revision 1.0
- Voting System Security Specification EVS 5.0.0.0, Revision 3.1
- Personnel Deployment and Training, Revision 1.0

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3.0 TEST BACKGROUND

Wyle Laboratories 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. Wyle 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 General Information

All testing performed as part of the test effort was performed at the Wyle Laboratories' Huntsville, Alabama facility with the exception of the DS200 and AutoMARK Product Safety Review which was performed by a third party test laboratory at the location listed below. DS850 Product Safety Review was performed by Wyle Laboratories for iBeta as part of the Unity 5.0.0.0 Certification Effort. Certification testing included: the inspection and evaluation of voting system documentation, tests of voting system under conditions simulating the intended storage, operation, transportation, and maintenance environments; and operational tests verifying system performance and function under normal and abnormal conditions. Qualification/Certification testing was limited to the ES&S EVS 5.0.0.0 Voting System, which includes items listed in Section 2 of this report.

The DS200 and AutoMARK Product Safety Reviews were performed by the following NRTL and OSHA certified laboratory and all testing was witnessed onsite by Wyle Laboratories:

MET Laboratories, Inc.
Safety Certifications
901 Sheldon Drive
Cary, NC 27513

3.2 Testing Scope

To evaluate the system test requirements and the scope of the test campaign, each section of the EAC 2005 VVSG was analyzed to determine the applicable tests. The EAC 2005 VVSG Volume I Sections, along with the strategy for evaluation, are described below:

- **Section 2: Functional Requirements** – The requirements in this section were tested during the FCA and System Integration test utilizing the "Wyle Baseline Test Cases" along with test cases specially designed for the ES&S EVS 5.0.0.0. The data input during these tests consisted of the predefined election definitions as contained in Appendix A.6 of this report.
- **Section 3: Usability and Accessibility** – The requirements in this section were tested during the Usability Test, FCA, and System Integration test utilizing a combination of the "Wyle Baseline Test Cases" and the "Wyle Baseline Usability Test Cases." The data input during this test consisted of the predefined election definitions contained in Appendix A.6 of this report.
- **Section 4: Hardware Requirements** – The requirements in this section were tested by trained Wyle personnel per sections 4.5 of this report.
- **Section 5: Software Requirements** – The requirements in this section were tested during source code review, TDP review, and FCA. A combination of review and functional testing was performed to ensure these requirements were met.

3.0 TEST BACKGROUND (Continued)

3.2 Testing Scope (Continued)

- **Section 6: Telecommunication** – The requirements in this section only apply to the EMS components and the DS850. They were tested in FCA, System Integration, and Accuracy
- **Section 7: Security Requirements** – The requirements in this section were tested during source code review, FCA, System Integration, and Security Tests.
- **Section 8: Quality Assurance (QA) Requirements** – The requirements in this section were tested throughout the test campaign via various methods. TDP review was performed on the ES&S QA documentation to determine compliance to EAC 2005 VVSG requirements and the requirements stated in the ES&S QA Program document. All source code was checked to ensure that proper QA documentation had been completed. All equipment received for initial testing and follow up testing was checked against ES&S documentation to ensure their QA process is being followed.
- **Section 9: Configuration Management (CM) Requirements** – The requirements in this section were tested throughout the test campaign. TDP review was performed on the ES&S configuration management documentation to determine EAC 2005 VVSG compliance and to further determine whether ES&S is following its documented CM requirements within the TDP. During source code review, Wyle qualified personnel verified that ES&S was following EAC 2005 VVSG CM requirements as well as ES&S CM requirements. All equipment received for initial testing and follow up testing was checked against ES&S documentation to ensure their CM process is being followed.

The ES&S EVS 5.0.0.0 Voting System is a paper- based precinct counting system. Therefore, all EAC 2005 VVSG requirements intended for DRE were excluded from this test campaign, as well as the following:

- Volume I Section 6 (Telecommunication Requirements)
- Volume I Section 7.5.2-7.5.4 (Telecommunications and Data Transmission)
- Volume I Section 7.6 (Use of Public Communication Networks)
- Volume I Section 7.7 (Wireless Communications)
- Volume I Section 7.9 (Voter Verifiable Paper Audit Trail Requirements)

The rationale for not evaluating the EVS 5.0.0.0 Voting System to the requirements contained in the indicated sections of the EAC 2005 VVSG is described in Table 3-1.

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3.0 TEST BACKGROUND (Continued)

3.2 Testing Scope (Continued)

Table 3-1 Not Applicable Requirements

EAC 2005 VVSG Volume I Section	Rationale for 'Not Applicable'
6, 7.5.2-7.5.4	These requirements are written for use on public networks. The ES&S EVS 5.0.0.0 Voting System does not use public networks.
7.6	This section pertains to "Voting systems that transmit data over public telecommunications…" The ES&S EVS 5.0.0.0 Voting System as configured for this certification does not permit transmission over public networks.
7.7	No wireless technology is present in ES&S EVS 5.0.0.0 Voting System.
7.9	The ES&S EVS 5.0.0.0 Voting System is a paper based system.

3.3 Wyle Quality Assurance

All work performed on this program was in accordance with Wyle Laboratories' Quality Assurance Program and Wyle Laboratories' Quality Program Manual, which conforms to the applicable portions of International Standard Organization (ISO) Guide 17025.

The Wyle Laboratories, Huntsville Facility, Quality Management System is registered in compliance with the ISO-9001 International Quality Standard. Registration has been completed by Quality Management Institute (QMI), a Division of Canadian Standards Association (CSA).

3.4 Test Equipment and Instrumentation

All instrumentation, measuring, and test equipment used in the performance of this test program was calibrated in accordance with Wyle Laboratories' Quality Assurance Program, which complies with the requirements of ANSI/NCSL 2540-1, ISO 10012-1, and ISO/IEC 17025. 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.

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3.0 TEST BACKGROUND (Continued)

3.5 Terms and Abbreviations

This subsection defines all terms and abbreviations applicable to the development of the Test Plan.

Table 3-2 Terms and Abbreviations

Term	Abbreviation	Definition
Americans with Disabilities Act of 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 Logging Service	ELS	---
Election Management System	EMS	Within the EVS 5.0.0.0 Voting System, the EMS is comprised of five components: ElectionWare, ERM, ES&S Event Logging Service, and VAT Previewer.
Election Reporting Manager	ERM	EVS 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.

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3.0 TEST BACKGROUND (Continued)

3.5 Terms and Abbreviations (Continued)

Table 3-2 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. A witnessed build of the executable system is performed to ensure the certified release is built from tested components.
Quality Assurance	QA	--
Regression Testing	n/a	The process of examining and testing to verify that all functional and firmware modifications made during the test campaign did not introduce new errors or non-conformities into the voting system.
System Under Test	SUT	Refers to the system as a whole (all components).
Secure File Transfer Protocol	SFTP	A network protocol that provides file access, files transfer, and file management functionality over any reliable data stream.
Technical Data Package	TDP	Manufacturer documentation related to the voting system required to be submitted as a precondition of certification testing.
Uninterruptible Power Supply	UPS	---
Voter Assist Terminal	VAT	The electronic ballot marking device component is the ES&S AutoMARK™.
Voluntary Voting System Guidelines	EAC 2005 VVSG	Published by the EAC, the third iteration of national level voting system standards.
Wyle Laboratories, Inc.	Wyle	---
Wyle Operating Procedure	WoP	Wyle Test Method or Test Procedure.
Voting System Test Laboratory	VSTL	Wyle Labs.
Voluntary Voting System Guidelines	VVSG	EAC Voluntary Voting System Guidelines V. 1.0.

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4.0 TEST FINDINGS AND RECOMMENDATIONS

The ES&S EVS 5.0.0.0 Voting System, as identified in Section 2 of this report, was subjected to the tests as summarized in the following paragraphs.

4.1 Source Code Review

As part of the testing activities, the ES&S EVS 5.0.0.0 Voting System received a 100% source code review to the EAC 2005 VVSG coding standards and the manufacturer supplied coding standards. The manufacturer supplied coding standards (ESSSYS_D_D_0100_Coding Standards) can be found within the vendor provided TDP. The review was conducted per the guideline described in the following paragraph.

As the updated source code was received, a SHA1 hash value was created for each source code file. The source code team then conducted a visual scan of every line of modified source code. This was done to identify any violation of EAC 2005 VVSG coding standards or manufacturer supplied coding standards. The COTS tools utilized by the source code group were Beyond Compare and Crimson Editor. Each identified violation was then recorded by making notes of the standards violation along with directory name, file name, and line number.

Summary Findings

Other than the coding standards noted in the technical summary reports, no other deficiencies or significant problems were found during the source code review. A technical summary report of all identified standards violations was sent to ES&S for resolution. ES&S then corrected all standards violations and re-submitted the source code for re-review. The Source Code Review Report that summarizes the discrepancies noted is included in Appendix A.8 of this report. The Notice of Anomaly (NOA No. 18) documenting that source code discrepancies were found is included in Appendix A.1 of this report.

4.2 Witnessed Build

A Witnessed Build of the software was created using ES&S trusted build documents. The “Trusted Build” was performed by completing the following tasks in the order listed:

- Clear hard drive of existing data
- Retrieve the compliant source code
- Retrieve the installation media for OS, compilers, and build software
- Construct the build environment
- Create disk image of the build environment
- Load the compliant source code into the build environment
- Create a disk image of the pre-build environment
- Create a digital signature of the pre build environment
- Build executable code
- Create a disk image of the post-build environment
- Create a digital signature of executable code
- Build installation media

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.2 Witnessed Build (Continued)

- Create a digital signature of the installation media
- Install executable code onto the system and validate the software/firmware
- Deliver source code with digital signature, disk image of pre-build environment with digital signatures, disk image of post-build environment with digital signatures, executable code with digital signatures, and installation media to the EAC Repository.

The "Trusted Build" for the ES&S EVS 5.0.0.0 includes source code, data, and script files, in clear text form. The build also includes COTS software on commercially available media, COTS software downloaded by the VSTL, COTS software verified by SHA1 from the software supplier, and picture and sound files in binary format provided by ES&S. The first step of the process was to clean the hard drives by writing data to every spot on the hard drive, so the drive is cleared of existing data. The Microsoft Windows XP Professional operating system was then loaded and the applications from the VSTL reviewed source along with the VSTL verified COTS software was built. The final step was installing the applications on the hardware.

Summary Findings

Wyle performed a Witnessed Build for each software component of the ES&S EVS 5.0.0.0 on March 3-8, 2013. ES&S Technical Representative for the Witnessed Build was Dave Herrera. The products from the Witness Build shall be supplied to the EAC as part of the certification effort. The detailed steps followed during the performance of the Witnessed Build are presented in Appendix C.

4.3 Technical Data Package Review

The ES&S EVS 5.0.0.0 Voting System Technical Data Package (TDP) was reviewed to the VVSG. This review was performed as part of the pre-testing activities. The documents included in the TDP review are listed in Section 2.5 of this document.

The TDP contains information about requirements, design, configuration management, quality assurance, and system operations. The EAC requirements state that, at a minimum, the TDP shall contain the following documentation: system configuration overview; system functionality description; system hardware specifications; software design and specifications; system test and verification specifications; system security specifications; user/system operations procedures; system maintenance procedures; personnel deployment and training requirements; configuration management plan; quality assurance program; and system change notes.

The TDP documents were reviewed for accuracy, completeness, and compliance to the VVSG. The TDP documentation served as the basis for design and development of the functional tests. Functional testing also identified text in the TDP that conflicted with the actual operation of the system. These discrepancies were reported to ES&S and tracked as test exceptions until verified that the applicable documents had been corrected.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.3 Technical Data Package Review (Continued)

Summary Findings

The review results were recorded in a worksheet that provided the pass/fail compliance to each applicable VVSG requirement. ES&S corrected nonconformance observations and resubmitted the associated documents for review. This process continued until the TDP complied with TDP Standards.

A summary of the TDP issues encountered is provided below.

- Documents that were not included in the submitted TDP package were referenced for information.
- Some descriptive information included was inconsistent with descriptions in other TDP documents.
- Placeholders within some of the documents indicated information was not yet inserted.
- Not all VVSG requirements were initially addressed in some of the documents.
- Some of the individual user guides included information which conflicted with the actual information encountered when verified during the testing process.

All noted TDP issues were resolved prior to the conclusion of the review process. The Technical Data Package Review Report that summarizes the discrepancies noted is included in Appendix A.7 of this report. The Notice of Anomaly (NOA No. 17) documenting that TDP discrepancies were found is included in Appendix A.1 of this report.

4.4 QA and CM System Review

The ES&S QA Plan and CM Plan were reviewed to determine compliance with EAC 2005 VVSG Volume I Sections 8 and 9 and Volume II Sections 2 and 7 requirements, and with the requirements of the internal ES&S documentation. Also, the ES&S Technical Data Package was reviewed to determine if the ES&S QA Plan and the CM Plan were being followed.

Summary Findings

Wyle conducted a remote audit of ES&S QA Program, during which Wyle requested artifacts from ES&S' documented QA Program. Wyle provided ES&S an artifact checklist targeting the following areas:

- Pre-Product Development
- Product Change Management
- Fielded Products and Manufacturing

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 QA and CM System Review (Continued)

Summary Findings (Continued)

ES&S was allowed an 8-hour business day to provide the requested artifacts. Wyle reviewed the received artifacts against the ES&S documented procedures. Wyle accepted all of the artifacts received during this audit as meeting the stated process and procedures in the ES&S QA & CM Plan.

4.5 Hardware Testing

Hardware testing included: the inspection and evaluation of voting system documentation; tests of voting system under conditions simulating the intended storage, operation, transportation, and maintenance environments; and operational tests verifying system performance and function under normal and abnormal conditions. Hardware testing was limited to the EVS 5.0.0.0 Voting System.

Table 4-1 VVSG Test Requirements

REPORT SECTION	VVSG VOL. I SECTION	VVSG VOL. II SECTION	TEST DESCRIPTION
4.3		2.1	Technical Data Package Review
4.6.1		4.6.4	Low Temperature Test
4.6.1		4.6.5	High Temperature Test
4.6.1		4.6.3	Vibration Test
4.6.1		4.6.2	Bench Handling Test
4.6.1		4.6.6	Humidity Test
4.6.2		4.7.1	Temperature/Power Variation Test
4.6.2	3.2.2.2		Acoustic Noise Level Test
4.7.1	4.1.2.5	4.8A	Electrical Power Disturbance Test
4.7.2	4.1.2.9	4.8B	Electromagnetic Radiation Test
4.7.3	4.1.2.8	4.8C	Electrostatic Disruption Test
4.7.4	4.1.2.10	4.8D	Electromagnetic Susceptibility Test
4.7.5	4.1.2.6 (a)	4.8E	Electrical Fast Transient Test
4.7.6	4.1.2.7 (a) (b)	4.8F	Lightning Surge Test
4.7.7	4.1.2.11 (a)	4.8G	Conducted RF Immunity Test
4.7.8	4.1.2.12	4.8H	Magnetic Fields Immunity Test
4.7.9	4.3.8		Product Safety Review, UL60950-1*
4.7.10	4.1.2.4		Electrical Supply
4.7.11		4.7.2	Maintainability Test

*Safety testing was witnessed by Wyle at a third party laboratory

4.6 Environmental Tests

Environmental tests were performed to ensure that the EUT and associated machine resident firmware were in compliance with the VVSG.

During test performance, the EUT was configured as it would be for use in an election precinct.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 Environmental Tests (Continued)

4.6.1 Non-Operating Environmental Tests (Continued)

The EUT was subjected to various Non-Operating Environmental Tests. Prior to and immediately following each test environment, the EUT was powered on and subjected to operability functional checks to verify continued proper operation. The EUT was not powered on during the performance of any of the non-operating tests.

Low Temperature Test

The EUT was subjected to a Low Temperature Test in accordance with section 4.6.4 of Volume II of the VVSG. The purpose of this test is to simulate stresses associated with the storage of voting machines and ballot counters. This test is equivalent to the procedure of MIL-STD-810D, Method 502.2, Procedure I-Storage, with a minimum temperature of -4°F.

Prior to test initiation, the EUT was subjected to a baseline operability checkout to verify system readiness. The EUT was then placed in an environmental test chamber and the chamber temperature was lowered to -4°F and allowed to stabilize. Upon temperature stabilization, the temperature was maintained for an additional four hours. The temperature was then returned to standard laboratory ambient conditions at a rate not exceeding 10°F per minute.

The EUT was removed from the chamber and inspected for any obvious signs of degradation and/or damage. None were observed. The EUT was successfully subjected to a post-test operability checkout.

The EUT successfully completed the requirements of the Low Temperature Test. The Low Temperature Test Chamber Circular Chart and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

High Temperature Test

The EUT was subjected to a High Temperature Test in accordance with section 4.6.5 of Volume II of the VVSG. The purpose of this test is to simulate stresses associated with the storage of voting machines and ballot counters. This test is equivalent to the procedure of MIL-STD-810D, Method 501.2, Procedure I-Storage, with a maximum temperature of 140°F.

Prior to test initiation, the EUT was subjected to a baseline operability checkout to verify system readiness. The EUT was then placed in an environmental test chamber and the chamber temperature was raised to 140°F and allowed to stabilize. Upon temperature stabilization, the temperature was maintained for an additional four hours. The temperature was then returned to standard laboratory ambient conditions at a rate not exceeding 10°F per minute.

The EUT was removed from the chamber and inspected for any obvious signs of degradation and/or damage. None were observed. The EUT was successfully subjected to a post-test operability checkout.

The EUT successfully completed the requirements of the High Temperature Test. The High Temperature Test Chamber Circular Chart and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 Environmental Tests (Continued)

4.6.1 Non-Operating Environmental Tests (Continued)

Vibration Test

The EUT was subjected to a Vibration Test in accordance with section 4.6.3 of Volume II of the VVSG. The purpose of this test is to simulate stresses faced during transport of voting machines and ballot counters between storage locations and polling places. This test is equivalent to the procedure of MIL-STD-810D, Method 514.3, Category 1- Basic Transportation, Common Carrier.

Prior to test initiation, the EUT was subjected to a baseline operability checkout to verify system readiness. Upon completion, the EUT was secured to an electro dynamics shaker. One control accelerometer was affixed to the shaker table. The EUT was subjected to the Basic Transportation, Common Carrier profile as depicted in Mil-Std-810D, Method 514.3, Category I, with a frequency range from 10 to 500 Hz and an overall rms level of 1.04, 0.74, and 0.20 G for duration of 30 minutes in each orthogonal axis.

The vibration test for the DS200 was repeated four times. Upon each test completion, the DS200 was inspected for any obvious signs of degradation and/or damage. Inspections after the first three runs revealed parts that had become loose or were freely moving. The DS200 successfully completed the requirements of the Vibration Test on the fourth attempt. Notices of Anomaly 1, 2, 3, and 4 can be found in Appendix A.1 of this test report. Additional details of each anomaly are in section 4.9 Anomalies and Resolutions. The Vibration Test Data Sheets and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

Bench Handling Test

The EUT was subjected to a Bench Handling Test in accordance with section 4.6.2 of Volume II of the VVSG. The purpose of this test is to simulate stresses faced during maintenance and repair of voting machines and ballot counters. This test is equivalent to the procedure of MIL-STD-810D, Method 516.3, Procedure VI.

Prior to performance of the test, the EUT was subjected to a baseline operability checkout. Following the checkout, each edge of the base of the machine was raised to a height of four inches above the surface and allowed to drop freely. This was performed six times per edge, for a total of 24 drops. Upon test completion, the EUT was inspected for any obvious signs of degradation and/or damage. None were observed. The EUT was subjected to a post-test operability checkout and continued operability verified.

The EUT successfully completed the requirements of the Bench Handling Test. The Bench Handling Data Sheet and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 Environmental Tests (Continued)

4.6.1 Non-Operating Environmental Tests (Continued)

Humidity Test

The EUT was subjected to a Humidity Test in accordance with section 4.6.6 of Volume II of the VVSG. The purpose of the test was to simulate stresses encountered during storage of voting machines and ballot counters. This test is similar to the procedure of MIL-STD-810D, Method 507.2, Procedure I-Natural Hot-Humid.

The EUT was subjected to a baseline operability checkout to verify system readiness. Upon completion, the EUT was placed in an environmental test chamber and was subjected to a 10-day humidity cycle in accordance with the 24-hour cycle values. For a full description of the Humidity Test Data see the Hardware Report in Appendix A.2.

Upon test completion, the EUT was inspected for any obvious signs of degradation and/or damage. It was discovered that the AutoMARK A100 failed to function properly during the Post Operating Status Check. On the second attempt the AutoMARK A100 successfully completed the requirements of the Humidity Test. Notices of Anomaly 5, 6, and 13 can be found in Appendix A.1 of this test report. Additional details of each anomaly are in section 4.9 Anomalies and Resolutions. The Chamber Circular Chart and Instrumentation Equipment Sheet for the test are presented in the Hardware Test Report Appendix A.2.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 Environmental Tests (Continued)

4.6.2 Operating Environmental Tests

Temperature/Power Variation Test

The EUT was subjected to a Temperature and Power Variation Test in accordance with section 4.7.1 of Volume II of the VVSG. The purpose of this test was to evaluate system operation under various environmental conditions. The total cumulative duration of the test was at least 163 hours, with 48 hours in the environmental test chamber. For the remaining hours, the equipment was operated at room temperature. This test is similar to the low temperature and high temperature tests of MIL-STD-810-D, Method 502.2 and Method 501.2.

To perform the test, the EUTs were placed inside an environmental walk-in test chamber and connected to a variable voltage power source. Two DS200 units were configured to scan 100 ballots per hour, while two AutoMark units were configured to mark 1 ballot an hour. Additionally, two DS850 units were configured to scan 300 ballots per hour. The temperature inside the chamber and the voltage supplied to the hardware varied from 50°F to 95°F and from 105 VAC to 129 VAC (as depicted in Figures 2-3 through 2-6). During test performance, the operational functions were continuously exercised by the scanning of ballots and the marking of ballots via audio voting. At the conclusion of the Temperature and Power Variation Test all ballots produced via the AutoMARK during the test were then processed by casting the ballots through the DS200 and the DS850. All 170 ballots were tabulated and all results were verified and validated to be accurate.

Summary Findings

The Temperature/Power Variation Test was restarted a total of three times. Three anomalies were identified during this test and ES&S addressed these issues from the hardware prospective. Notices of Anomaly 11, 12, and 14 can be found in Appendix A.1 of this test report. Additional details of each anomaly are in section 4.9 Anomalies and Resolutions. At the conclusion of the successful run, operational status checks were performed resulting in the EUTs successfully completing the requirements of the Temperature/Power Variation, Data Accuracy, and Reliability Tests.

Hardware Test Report Appendix A.2 contains the Temperature/Power Variation data.

Acoustic Noise Level Test

The EUT was subjected to an Acoustic Noise Level Test to satisfy the following requirements of Section 3.2.2.2 (c) of Volume I of the 2005 VVSG:

Section 3.2.2.2 (c) of Volume I of the 2005 VVSG

v. The voting machine shall set the initial volume for each voter between 40 and 50 dB SPL.

vi. The voting machine shall provide a volume control with an adjustable volume from a minimum of 20 dB SPL up to a maximum of 100 dB SPL, in increments no greater than 10 dB.

vii. The audio system shall be able to reproduce frequencies over the audible speech range of 315 Hz to 10 KHz.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 Environmental Tests (Continued)

4.6.2 Operating Environmental Tests (Continued)

Summary Findings

During the performance of this test two anomalies were identified. Both the A100 and A200 failed to reach the maximum 100 dB SPL and ES&S addressed these issues from a firmware prospective. Notices of Anomaly 9 and 10 can be found in Appendix A.1 of this test report. Additional details of each anomaly are in section 4.9 Anomalies and Resolutions. The test was repeated successfully for only the maximum dB SPL levels for both the A100 and A200.

Hardware Test Report Appendix A.2 contains the Acoustic Noise Level test data.

4.7 Electrical Tests

Electrical tests were performed to ensure that the EUT and associated machine resident firmware were in compliance with the VVSG.

During test performance, the EUT was configured as it would be for use in an election precinct.

The EUT was subjected to various electrical tests to ensure continued system operation and reliability in the presence of abnormal electrical events. The EUT was powered and actively counting ballots during all electrical tests. Prior to and immediately following each electrical test, an operational status check was performed. The electrical tests for the EVS 5.0.0.0 Voting System were performed during prior test campaigns. The test data is contained in the Hardware Test Report Appendix A.2.

4.7.1 Electrical Power Disturbance

Electrical Power Disturbance testing was performed in accordance with sections 4.1.2.5 of Volume I and 4.8 of Volume II of the VVSG. This testing was performed to ensure that the EUT was able to withstand electrical power line disturbances (dips/surges) without disruption of normal operation or loss of data.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing, and subjected to the voltage dips and surges over periods ranging from 20ms to four hours.

The EUT successfully met the requirements of the Electrical Power Disturbance Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

4.7.2 Electromagnetic Radiation Test (FCC Part 15 Emissions)

Electromagnetic Radiation emissions measurements were performed in accordance with sections 4.1.2.9 of Volume I and 4.8 of Volume II of the VVSG. This testing was performed to ensure that emissions emanating from the unit do not exceed the limits of FCC Part 15, Class B emissions. The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing.

The EUT was found to comply with the required emissions limits. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.7 Electrical Tests (Continued)

4.7.3 Electrostatic Disruption

Electrostatic Disruption testing was performed in accordance with sections 4.1.2.8 of Volume I and 4.8 of Volume II of the VVSG to ensure that should an electrostatic discharge event occur during equipment setup and/or ballot counting, that the EUT would continue to operate normally. A momentary interruption is allowed so long as normal operation is resumed without human intervention or loss of data.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing without operator intervention. The EUT was then subjected to electrostatic discharges of +/- 8 kV contact and +/- 15 kV air. Discharges were performed at areas typical of those which might be touched during normal operation, including the touch screen, user buttons, and other likely points of contact.

There was no loss of normal operation or loss of data as a result of the applied discharges.

The EUT successfully met the requirements of the Electrostatic Disruption Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

4.7.4 Electromagnetic Susceptibility

Electromagnetic Susceptibility testing was performed in accordance with sections 4.1.2.10 of Volume I and 4.8 of Volume II of the 2005 VVSG. This testing was performed to ensure that the EUT was able to withstand a moderate level of ambient electromagnetic fields without disruption of normal operation or loss of data.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing without operator intervention. The EUT was then subjected to ambient electromagnetic fields at 10 V/m over a range of 80 MHz to 1000 MHz.

There was no loss of normal operation or loss of data as a result of the applied electromagnetic fields.

The EUT successfully met the requirements of the Electromagnetic Susceptibility Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

4.7.5 Electrical Fast Transients

Electrical Fast Transients (EFT) testing was performed in accordance with sections 4.1.2.6 (a) of Volume I and 4.8 of Volume II of the 2005 VVSG to ensure that, should an electrical fast transient event occur on a power line, the EUT would continue to operate without disruption of normal operation of loss of data. Section 4.1.2.6 (b) of Volume I is not applicable because there are no I/O lines greater than three meters.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing without operator intervention. The EUT was then subjected to electrostatic fast transients of 2 kV applied to its AC power lines.

There was no loss of normal operation or loss of data as a result of the applied transients. The EUT successfully met the requirements of the Electrical Fast Transients Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.7 Electrical Tests (Continued)

4.7.6 Lightning Surge

Lightning Surge testing was performed in accordance with sections 4.1.2.7 (a), (b) of Volume I and 4.8 of Volume II of the 2005 VVSG to ensure that, should a surge event occur on a power line due to a lightning strike, the EUT will continue to operate without disruption of normal operation or loss of data. Sections 4.1.2.7 (c), (d), and (e) are not applicable because there are no DC lines greater than 10 meters and no I/O lines greater than 30 meters.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing. The EUT power input lines were then subjected to lightning surge testing at a level of 2 kV applied to its AC power line.

The EUT successfully met the requirements of the Lightning Surge Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

4.7.7 Conducted RF Immunity

Conducted RF Immunity testing was performed in accordance with sections 4.1.2.11 (a) of Volume I and 4.8 of Volume II of the 2005 VVSG. Section 4.1.2.11 (b) of Volume I is not applicable because there are no signal/control lines greater than three meters. This testing was performed to ensure that the EUT was able to withstand conducted RF energy onto its power lines without disruption of normal operation or loss of data.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing without operator intervention. The EUT was then subjected to conducted RF energy of 10 V rms applied to its power lines over a frequency range of 150 kHz to 80 MHz.

There was no loss of normal operation or loss of data as a result of the applied conducted RF energy. The EUT successfully met the requirements of the Conducted RF Immunity Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

4.7.8 Magnetic Fields Immunity

Magnetic Fields Immunity testing was performed in accordance with sections 4.1.2.12 of Volume I and 4.8 of Volume II of the 2005 VVSG. This testing was performed to ensure that the EUT was able to withstand AC magnetic fields without disruption of normal operation of loss of data.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing. The EUT was then subjected to AC magnetic fields of 30 A/m at a 60 Hz power line frequency.

There was no loss of normal operation or loss of data as a result of the applied magnetic field.

The EUT successfully met the requirements of the Magnetic Fields Immunity Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in the Hardware Test Report Appendix A.2.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.7 Electrical Tests (Continued)

4.7.9 Product Safety Review

The VVSG states that all voting systems shall meet the following requirements for safety:

All voting systems and their components shall be designed to eliminate hazards to personnel or to the equipment itself.

Defects in design and construction that can result in personal injury or equipment damage must be detected and corrected before voting systems and components are placed into service.

Equipment design for personnel safety shall be equal to or better than the appropriate requirements of the Occupational Safety and Health Act, Code of Federal Regulations, Title 29, Part 1910.

To satisfy these requirements, the voting system was subjected to a Product Safety Review in accordance with UL 60950-1, "Safety of Information Technology Equipment".

Hardware Test Report Appendix A.2 contains the Product Safety Review data.

4.7.10 Electrical Supply Testing

Components of voting systems that require an electrical supply shall meet the following standards:

Precinct count voting systems shall operate with the electrical supply ordinarily found in polling places (Nominal 120 Vac/60Hz/1 phase).

Central count voting systems shall operate with the electrical supply ordinarily found in central tabulation facilities or computer room facilities (Nominal 120 Vac/60Hz/1, nominal 208 Vac/60Hz/3 or nominal 240 Vac/60Hz/2).

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.

The AutoMARK and DS850 successfully completed the requirements of the Electrical Supply Test. However, the DS200s did not meet the initial 2 hour minimum requirement. Two anomalies (1 per each DS200) were identified. Notices of Anomaly 7 and 8 can be found in Appendix A.1 of this test report. Additional details of each anomaly are in section 4.9 Anomalies and Resolutions. The test was repeated successfully on the DS200s after ES&S addressed these issues from a firmware prospective.

Hardware Test Report Appendix A.2 contains the Electrical Supply Test data.

4.7.11 Maintainability

All maintenance required actions listed in the TDP were performed by Wyle Laboratories personnel to determine the ability to perform the actions required.

The AutoMARK, DS200, and DS850 successfully completed the requirements of the Maintainability Test.

4.8 System Level Testing

System Level Testing was performed to evaluate the integrated operation of the voting system hardware and software. The suite of tests that comprise the System level Testing includes: Volume and Stress Test, System Integration Test, Security Test, Usability and Accessibility Tests, Data Accuracy, as well as the Physical and Functional Configuration Audits.

As part of System Level Testing, the system limits that ES&S has stated to be supported by the EVS 5.0.0.0 Voting System as well as the tested values and the test performed to verify each limit are compiled in Table 4-2.

Table 4-2 EVS 5.0.0.0 System Limits

Limit (Maximum Number of)	Declared Value	Tested Value	Test Performed
Precincts in Election	9,900	9,900	Volume and Stress
Contests in Election	21,000	21,000	Volume and Stress
Candidates/Counters in Election	21,000	21,000	Volume and Stress
Candidates/Counters in Precinct	1,000	1,000	Volume and Stress
Candidates/Counters in Tabulator	65,500	65,500	Volume and Stress
Maximum Precinct Element	500,000	500,000	Volume and Stress
Ballot Styles in Election	9,900	9,900	Volume and Stress
Contests in a Ballot Style	200	200	Volume and Stress
Candidates in a Contests	175	175	Volume and Stress
Ballot Styles in a Precinct	40	40	Volume and Stress
Number of Parties	Gen-=75, Prim=20	Gen=75, Prim=20	Volume and Stress
Vote For in Contest	98	98	Volume and Stress
Supported Languages per Election	5*	Verified Possible	System Integration (3)

*** "Verified Possible" means that the limit was tested during the FCA, but could not be verified in an election environment because of dependencies in the ballot layout configuration. The stated limits in the "Test Performed" column were tested in an election environment.**

An overview of the suite of tests performed during System Level Testing is provided in the following paragraphs, along with the summary findings of each test.

4.8.1 Volume and Stress Test

The EVS 5.0.0.0 Voting System was subjected to a Volume and Stress Test in accordance with the requirements of Section 6.2.3 of Volume II of the VVSG. The purpose of the test was to investigate the system's response to conditions that tend to overload the system's capacity to process, store, and report data. The Volume Test parameters were dependent upon the maximum number of active voting positions and the maximum number of ballot styles that the TDP claims the system can support. Testing was performed by exercising election definitions developed specifically to test for volume and stress (Election Definitions: Elections A-F contained in Table 4-3 of this document).

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.8 System Level Testing (Continued)

4.8.1 Volume and Stress Test (Continued)

Table 4-3 EVS 5.0.0.0 Volume and Stress

Voting Pattern	"Test Decks" were created for each election definition: **<u>Election A</u>:** **LIMITS TESTED:** ▪ Maximum Precincts in an election (9900) ▪ Maximum Ballot Styles in an Election (9900) ❑ **DS200 Test Deck: 584 Ballots** ▪ Test deck consisted of first 500 precincts then every 100th ballot starting at precinct 600 and ending at 9900. Even precincts voted for candidate 1 and odd precincts voted for write in ❑ **DS850 Test Deck: 9900 Ballots** ▪ Test deck consisted of precincts 1 to 9900, even precincts voted for candidate 1 and odd precincts voted for write in ❑ **AutoMARK: First five precincts loaded in AutoMARK** ▪ Voted each contest on ballot **<u>Election B:</u>** **Limits Tested:** ▪ Maximum Precinct Elements Tabulator (65,500) ▪ Maximum Precinct Elements ERM (500,000) ▪ **Test Deck: All Fill Ballot with 6 contests that each consist of a Vote for 82** ▪ 1st oval in each contest is filled, all others are left blank ❑ **DS200 Test Deck: 1 ballot per pass** ▪ Run in Admin Mode ▪ 8 total passes: Passes 1-7, 809 times; Pass 8, 510 times ▪ Reports configured to include Over/Under reporting ▪ Passes 1-7 will increment UNDERVOTES for each contest by 65,529 on each pass (81 x 809 = 65,529) ▪ On pass 8, total UNDERVOTE value will reach 500,013 (65,529 x 7) + (81 x 510) = 500,013 ❑ **DS850 Test Deck: 100 ballots** ▪ Run the test deck eight times, twice in each orientation, and then one run of nine ballots from the test deck for a total of 809. ▪ Export to USB, clear results and repeat seven more times, (saving each run on separate USB) with the eighth run consisting of 510 ballots. ❑ **AutoMARK: Marked first candidate in each contest on a ballot**

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.8 System Level Testing (Continued)

4.8.1 Volume and Stress Test (Continued)

Table 4-3 EVS 5.0.0.0 Volume and Stress (Continued)

Voting Pattern	**Election C:** **Limits Tested:** ▪ Maximum candidate counters/election (21,000) ▪ Maximum contests allowed in an election (21,000) ▪ Maximum candidates/contest (175) ▪ Maximum "Vote for"/contest (98) ▪ Maximum number of parties in a General Election **(75)** ❑ **DS200 & DS850 Test Deck: 156 ballots (One ballot for each ballot style in election)** ▪ Every EVEN candidate POSITION of each contest was marked with the exception of contest ten in which the first 12 candidates, the last 10 candidates and every other candidate in between was marked to confirm a "vote for 98" ❑ **AutoMARK Test Deck: Marked 15 randomly selected ballots** **Election D:** **Limits Tested:** ▪ Maximum number of parties in a Primary Election (20 including nonpartisan party) ❑ **DS200 & DS850 Test Deck: 20 Ballots (One ballot for each party)** ▪ Each candidate was marked ▪ Test deck ran four times, once in each orientation ▪ All candidates received four votes ❑ **AutoMARK Test Deck: 20 ballots** ▪ Each candidate was marked **Election E:** **Limits Tested:** ▪ Maximum district types (20) ▪ Maximum district names (40) ❑ **DS200 & DS850 Test Deck: 40 ballots (One for each district name)** ▪ Each candidate was marked ▪ Test deck ran four times, once in each orientation ▪ All candidates received four votes ❑ **AutoMARK Test Deck: One ballot** ▪ Each candidate was marked

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.8 System Level Testing (Continued)

4.8.1 Volume and Stress Test (Continued)

Table 4-3 EVS 5.0.0.0 Volume and Stress (Continued)

Voting Pattern	**Election F:** **Limits Tested:** ▪ Maximum candidate\counters allowed per precinct (1,000) ▪ Maximum contests allowed per ballot style (200 or ballot positions) ❑ **DS200 & DS850 Test Deck: 1 ballot (200 contests)** ▪ Odd races voted for candidate 1 and even races voted for write in ▪ Test deck ran four times, once in each orientation ▪ Odd races candidate 1 receives four votes and even races write in receives four votes ❑ **AutoMARK Test Deck: One ballot** ▪ Candidate 1 marked on odd races, and write in marked on even races

Table 4-4 EVS 5.0.0.0 Volume and Stress Ballots Cast

Total Ballots Cast

System	Ballots Cast Per Election						Machines in Test	Total Ballots Cast
	A	B	C	D	E	F		
DS200	584	6173	156	80	160	4	1	7,157
DS850	9900	6173	156	80	160	4	1	16,473
AutoMARK	5	1	15	20	1	1	1	43
							Total	23,673

Summary Findings

At the conclusion of the Volume and Stress Test, the DS200, DS850, and AutoMARK units successfully exercised the stated system limits. There was one (1) each DS200, DS850, and AutoMARK component used for the duration of Volume and Stress performance. A total of 23,673 ballots were processed without issue upon the completion of the test. There were two anomalies noted during testing and the test was restarted from the beginning on each occurrence. Notices of Anomaly 15 and 16 can be found in Appendix A.1 of this test report. Additional details of each anomaly are in section 4.9 Anomalies and Resolutions.

4.8.2 System Integration Test

System Integration Testing was performed to test all system hardware, software, and peripherals. System Integration Testing focused on the complete system including all proprietary software, proprietary hardware, proprietary peripherals, COTS software, COTS hardware, and COTS peripherals configured as a precinct count unit as described in the ES&S-submitted TDP for the EVS 5.0.0.0 Voting System. To perform the System Integration Testing, Wyle developed specific procedures and test cases designed to test the system as a whole. These procedures demonstrated compliance of the EVS 5.0.0.0 Voting System to Sections 2, 3, 4, 5, and 6 of Volume I of the VVSG.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.8 System Level Testing (Continued)

4.8.2 System Integration Test (Continued)

The six election definitions exercised during the System Integration Testing are listed below and are presented in Appendix A.6 for further reference:

- GEN-01
- GEN-02
- GEN-03
- PRIM-01
- PRIM-02
- PRIM-03

Summary Findings

Through System Integration Testing, it was demonstrated that the system performed as documented with all components performing their intended functions. No anomalies were noted during testing. The individual requirements can be traced to the Requirements Matrix contained in Appendix E.

4.8.3 Security Test

The EVS 5.0.0.0 was subjected to Security Testing in accordance with the requirements of Section 7 of Volume I and Section 6.4 of Volume II of the VVSG. The purpose of the Security Test was to verify that security technologies implemented in the EVS 5.0.0.0 to secure the hardware, software, and storage media during pre-voting, voting, and post-voting activities perform as documented in the ES&S-supplied technical documentation and that it meets the requirements of the VVSG.

The Security Test was performed by running a security test suite to provide verification of the access controls and the physical controls documented by ES&S and to gather the necessary information for analysis by Wyle's security professional who holds CEH, CISSP, and CHFI certifications.

Summary Findings

After the initial security test findings were reported to ES&S, they supplied Wyle with an updated System Security Specification document. Wyle reviewed the document and an analysis was performed on the EMS desktop configured as documented by ES&S. Attempts were made to access certain functions of the EMS by users that did not have permissions to access those functions. Those attempts were unsuccessful.

In addition, security tie straps and tamper evident seals were provided and documented for the DS200, DS850, and AutoMARK hardware. The security tie straps/tamper evident seals and their documented installation were analyzed and found to be adequate. The test procedures followed during the Security Test are documented in the Security Test Case Procedure Specification presented in Appendix A.4 of this report. Wyle has determined EVS 5.0.0.0 to be compliant with the security requirements of the EAC 2005 VVSG. The security assessment report can be found in Appendix A.10 of this report.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.8 System Level Testing (Continued)

4.8.4 Usability and Accessibility Test

The EVS 5.0.0.0 Voting System was subjected to Usability and Accessibility Tests in accordance with Volume I, Section 3 of the EAC 2005 VVSG. The purpose of this testing was to assess conformance to the usability and accessibility requirements in the EAC 2005 VVSG.

Conformance to these requirements should result in an improved quality of interaction between the voter and the voting system and the effectiveness with which the system provides a comfortable and efficient voting session that provides confidence to the voter that their votes are cast correctly. Additional requirements for task performance are independence and privacy: the voter should normally be able to complete the voting task without assistance from others and the voter selections should be private.

The Usability and Accessibility requirements set forth by the VVSG and the Help America Vote Act (HAVA) ensure that all eligible voters are provided the ability to vote without discrimination regardless of any disabilities. As stated in the VVSG, to meet the requirements of the Usability and Accessibility Test, the voting system shall: conform to the specified usability requirements of Volume I, Section 3.1; provide the capabilities required by Volume I, Section 3.2; and, operate consistently with vendor specifications and documentation.

The requirements for physical, sensory, or cognitive disabilities shall be followed according to HAVA (a) (3) (B). Alternative languages shall be in accordance to HAVA (a) (4) and privacy mandated by HAVA (a) (1) (C). In addition Common Industry Format (CIF) shall be used for testing purposes according to ANSI/INCITS 354-2001 and in accordance with the VVSG. To help meet this requirement, ES&S submitted a summative usability test report to Wyle for review and is included in Appendix A.12 of this report.

Summary Findings

The EUT successfully met the requirements of the Usability and Accessibility Tests. The test cases performed and the procedures followed during the Usability and Accessibility Tests are documented in the Usability Test Case Procedure Specification presented in Appendix A.5 of this report. There were no notices of anomaly created as a result of these tests.

4.8.5 Data Accuracy Test

The EVS 5.0.0.0 Voting System was subjected to a Data Accuracy Test in accordance with the requirements of Section 4.7.1.1 of Volume II of the VVSG.

Per the EAC 2005 VVSG, data accuracy is defined in terms of ballot position error rate. This rate applies to the voting functions and supporting equipment that capture, record, store, consolidate, and report the selections (or absence thereof) made by the voter for each ballot position. To meet the requirements of this test, the voting system must be subjected to the casting of a large number of ballots to verify vote recording accuracy, i.e., at least 1,549,703 ballot positions correctly read and recorded.

Tables 4-6 to 4-8 show the breakdown of how many ballots of the different sizes were run during the accuracy test.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.8 System Level Testing (Continued)

4.8.5 Data Accuracy Test (Continued)

Table 4-5 EVS 5.0.0.0 Accuracy DS200

Ballot Size	No. of Ballots	No. Vendor Marked	No. Hand Marked	No. Ballot Positions per Ballot	No. of Machines in Test	X Voted=	Total Ballot Positions	Total Ballots
11 inch	50	15	35	392	3	5	294,000	750
14 inch	50	15	35	512	3	5	384,000	750
17 inch	50	15	35	640	3	5	480,000	750
19 inch	50	15	35	720	3	4	432,000	600
Total	**200**	**60**	**140**	**N/A**	**N/A**	**19**	**1,590,000**	**2850**

Table 4-6 EVS 5.0.0.0 Accuracy DS850

Ballot Size	No. of Ballots	No. Vendor Marked	No. Hand Marked	No. Ballot Positions per Ballot	No. of Machines in Test	X Voted=	Total Ballot Positions	Total Ballots
11 inch	50	15	35	392	2	7	274,400	700
14 inch	50	15	35	512	2	7	358,400	700
17 inch	50	15	35	640	2	7	448,000	700
19 inch	50	15	35	720	2	7	504,000	700
Total	**200**	**60**	**140**	**N/A**	**N/A**	**28**	**1,584,800**	**2800**

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.8 System Level Testing (Continued)

4.8.5 Data Accuracy Test (Continued)

Table 4-7 EVS 5.0.0.0 Accuracy AutoMARK

Ballot Size	No. of Ballots	No. Vendor Marked	No. Hand Marked	No. Ballot Positions per Ballot	No. of Machines in Test	X Voted=	Total Ballot Positions	Total Ballots
11 inch	40	N/A	N/A	792	10	1	316,800	400
14 inch	40	N/A	N/A	774	10	1	309,600	400
17 inch	50	N/A	N/A	966	10	1	483,000	500
19 inch	50	N/A	N/A	900	10	1	450,000	500
Total	**180**	**N/A**	**N/A**	**N/A**	**N/A**	**4**	**1,559,400**	**1800**

Summary Findings

The EVS 5.0.0.0 Voting System successfully met the requirements of the Data Accuracy Test by scanning and processing at least 1,549,703 ballot positions.

4.8.6 Physical Configuration Audit

A Physical Configuration Audit (PCA) of the EVS 5.0.0.0 Voting System was performed as part of the pre-testing activities in accordance with Section 6.6 of Volume II of the VVSG. The PCA compares the voting system components submitted for certification with the vendor's technical documentation and confirms that the documentation submitted meets the requirements of the Guidelines. The PCA included the following activities:

- Establishing a configuration baseline of software and hardware to be tested; confirm whether manufacturer's documentation is sufficient for the user to install, validate, operate, and maintain the voting system;
- Verifying software conforms to the manufacturer's specifications; inspect all records of manufacturer's release control system; if changes have been made to the baseline version, verify manufacturer's engineering and test data are for the software version submitted for certification;
- Reviewing drawings, specifications, technical data, and test data associated with system hardware, and to establish system baseline;
- Reviewing manufacturer's documents of user acceptance test procedures and data against system's functional specifications; resolve any discrepancy or inadequacy in manufacturer's plan or data prior to beginning system integration functional and performance tests;
- Subsequent changes to baseline software configuration made during testing, as well as system hardware changes that may produce a change in software operation are subject to re-examination.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.8 System Level Testing (Continued)

4.8.6 Physical Configuration Audit (Continued)

The PCA performed on the EVS 5.0.0.0 Voting System consisted of inspecting the following:

- The EVS Election Management System (EMS) software platform.
- DS200 Precinct Digital Scanner.
- DS850 Digital Scan Central Ballot Scanner.
- AutoMARK ADA Ballot Marking Device.
- All accessories, equipment, and documentation used with the EVS 5.0.0.0 Voting System.

Summary Findings

An initial baseline PCA was performed prior to commencement of the test campaign and is included in the Certification Test Plan contained in Appendix D. The initial PCA was revised during testing. The final PCA is presented in Appendix A.9 of this report. No discrepancies were noted during the PCA.

4.8.7 Functional Configuration Audit (FCA)

The functional configuration audit encompasses an examination of manufacturer's tests, and the conduct of additional tests, to verify that the system hardware and software perform all the functions described in the manufacturer's documentation submitted for the TDP. In addition to functioning according to the manufacturer's documentation, tests were conducted to insure all applicable EAC 2005 VVSG requirements are met.

A Functional Configuration Audit (FCA) of EVS 5.0.0.0 was performed in accordance with Section 6.7 of Volume II of the VVSG. The purpose of the FCA was to verify that EVS 5.0.0.0 performs as documented in the ES&S-supplied technical documentation during pre-voting, voting, and post-voting activities and validate that EVS 5.0.0.0 meets the requirements of the EAC 2005 VVSG. To perform the FCA, EVS 5.0.0.0 was subjected to a series of tests to simulate pre-voting, voting, and post-voting activities. These tests were performed to ensure compatibility of voting machine functions at the precinct level using the referenced firmware. During the FCA, both normal and abnormal data was input into the system to attempt to introduce errors and test for error recovery. The activities simulated were:

- Verification of hardware status via diagnostic reports prior to election;
- Performing procedures required to prepare hardware for election operations;
- Obtaining 'zero' machine report printouts on all contest fields;
- Performing procedures to open the polling place and enable ballot counting;
- Casting of ballots to demonstrate proper processing, error handling, and generation of audit data;
- Performing hardware operations required to disable ballot counting and closing the polls;

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.8 System Level Testing (Continued)

4.8.7 Functional Configuration Audit (FCA) (Continued)

- Obtaining machine reports and verifying correctness;
- Obtaining machine-generated audit logs and verifying correctness;

The FCA was divided into three phases: pre-voting, voting, and post-voting. The three phases are described in greater detail in the following paragraphs:

1. Pre-Voting

   Pre-Voting encompasses all activities performed to the point of loading the election data on a transport media. These activities include verifying roles, user administration, database administration, defining the political subdivisions, defining election types, defining voting variations, defining the ballot contents, audio ballot definition, election definition loading, auditing election creation process, producing pre- election reports, adding to existing elections, updating existing elections, modifying ballot styles, verifying alternative language translations, and loading an election on precinct count devices.

2. Voting

   Voting encompasses all activities performed by poll workers, voters, and warehouse maintenance technicians after an election has been loaded, through the processing of special votes such as absentee and provisional ballots. These activities include pre-election logic testing, diagnostic tests, opening the polls, activating ballots, voting and casting both normal and audio ballots, utilizing the usability and accessibility aspects of the accessible voting station, closing the polls, printing machine reports, performing post-election maintenance tasks, and executing special voting sessions such as the processing of absentee and provisional ballots.

3. Post-Voting

   Post-Voting encompasses all activities performed from verification of machine reports to the EMS post-election activities. These activities include verifying election results, tabulation of results, consolidating voted data, Election Media maintenance & cleaning, Election Media logs, concluding an election, backing up results, retaining election data for 22 months, deleting elections, and auditing voting machine log.

Summary Findings

There were deficiencies noted during this test. All deficiencies were documented during real-time test performance and were compiled into a report (presented in the Deficiency Report contained in Appendix A.11) for resolution tracking. The system successfully recovered from all abnormal and error conditions unless noted in the deficiency report. All deficiencies noted were corrected prior to the conclusion of the test campaign. The voting system successfully met the requirements of the FCA. The test cases performed and the procedures followed during the FCA are documented in the FCA Test Case Procedure Specification presented in Appendix A.3 of this report.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.8 System Level Testing (Continued)

4.8.8 Availability

The voting system achieved at least 99 percent availability during normal operation for the applicable functions of the system.

4.9 Anomalies and Resolutions

Wyle performed compliance testing of the EVS 5.0.0.0 Voting System to the EAC 2005 VVSG. During the test campaign, all data from all "pre-testing", hardware testing, software testing, functional testing, security testing, volume testing, stress testing, usability testing, accessibility testing, and reliability testing activities were combined to ensure all applicable EAC 2005 VVSG requirements that are supported by the EVS 5.0.0.0 Voting System had been tested.

A total of eighteen (Include Source Code and TDP) Notices of Anomaly were issued throughout the test campaign upon occurrence of a verified failure, an unexpected test result, or any significant unsatisfactory condition. All anomalies encountered during testing were successfully resolved prior to test completion. The Notices of Anomaly generated are presented in their entirety in Appendix A.1 of this report and are summarized below, along with their resolution.

Notice of Anomaly No. 1: Vibration Test: Following the vibration test performed on May 4, 2012, the DS200 was examined for anomalies that may have occurred during testing. It was discovered, upon opening the door that covers the USB ports and power switch that parts from the lock for the door had become loose and had fallen into the area surrounding the USB ports. An ES&S technician replaced the lock and all of its components. The test was restarted from the beginning.

Notice of Anomaly No. 2: Vibration Test: Following the vibration test performed on May 7, 2012, the DS200 was examined for anomalies that may have occurred during testing. It was discovered, upon opening the exterior cover, a screw with a captive washer had become loose and fallen into the bottom area adjacent to a large connector assembly on a metal tray. An ES&S technician inserted the screw back in its original location. The other screws in the area were also inspected and found to be acceptable. The test was restarted from the beginning.

Notice of Anomaly No. 3: Vibration Test: During the setup of the vibration test, the DS200 was dropped on its side causing the carrying case with the DS200 in it to come apart from the lower part of the ballot box. The DS200 and carrying case dropped from the vibration table to the concrete floor. The carrying case and the DS200 were damaged. The DS200 was examined by Wyle and ES&S which determined the damage was too great to continue. The unit was replaced and testing continued. This internal NOA was based on unit under test being dropped by Wyle personnel, and not a VVSG non-conformity.

Notice of Anomaly No. 4: Vibration Test: Following the vibration test performed on May 16, 2012, the DS200 was examined for anomalies that may have occurred during testing. Initially a component was heard to be loose inside the LCD case. It was discovered, upon opening the exterior cover of the LCD bezel, that a screw had become loose inside of the LCD case of the DS200. The like screw on the opposing side of the LCD bezel mount was found to be loose as well, but still attached. Photographs were taken of the anomaly and the remainder of the examination revealed some wear through 3 layers of material, exposing metal of the Li-ion Rechargeable Battery. An ES&S technician inserted the screws back in its original location. ES&S added additional steps in their DS200 checkout process to inspect the

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.9 Anomalies and Resolutions (Continued)

units for loose screws and nuts. The wear on the battery did not cause any issues with the functionally of the unit. The test was restarted from the beginning and completed successfully.

Notice of Anomaly No. 5: Humidity: During the AutoMARK A100 Humidity test being performed May 25, 2012 – June 04, 2012, the Humidity Chamber suffered a controller failure on May 29, 2012. When it was observed that the required environment could not be maintained, the test was halted and the units were removed from the failing chamber. A post-operational test was performed on all four EUTs that were being tested in the humidity chamber at the time of said failure. Testing was rescheduled to be performed June 01, 2012 – June 11, 2012 in an alternate humidity chamber. This internal NOA was based on chamber failure during test, and not a VVSG non-conformity.

Notice of Anomaly No. 6: Humidity: After being subjected to the Humidity test being performed June 01, 2012 – June 11, 2012, the AutoMARK A100 failed to function properly during the Post Operating Status Check. When it was observed that the unit could not successfully mark five consecutive ballots, it was at that time that the AutoMARK A100 portion of the Humidity test was identified as a failure. The reoccurring message during the failure was "Alert! A problem has occurred. Please notify an election official. There was an error while printing". After inspection, it was determined that the Contact Image Sensor (CIS) had stopped working properly. The ES&S technician replaced the CIS and the test was repeated successfully.

Notice of Anomaly No. 7: Electrical Supply: After being subjected to the Electrical Supply test being performed on June 19, 2012 the DS200's battery was depleted after only 1 hour, 37 minutes and 20 seconds. Since the DS200 shutdown prior to completing the 2 hour requirement, the Electrical Supply Test was identified as a failure. It was determined that the animation on the "Please Insert Your Ballot" screen caused the backup battery to be depleted before the required 2 hours. The firmware was updated to stop the animation when the DS200 is on the backup battery. The test was repeated successfully.

Notice of Anomaly No. 8: Electrical Supply: After being subjected to the Electrical Supply test being performed on June 19, 2012 the DS200's battery was depleted after only 1 hour, 43 minutes and 6 seconds. Since the DS200 shutdown prior to completing the 2 hour requirement, the Electrical Supply Test was identified as a failure. It was determined that the animation on the "Please Insert Your Ballot" screen caused the backup battery to be depleted before the required 2 hours. The firmware was updated to stop the animation when the DS200 is on the backup battery. The test was repeated successfully.

Notice of Anomaly No. 9: Acoustic Noise Level Test: After being subjected to the Acoustic Noise Level Test and Hearing Aid Compatibility as performed on June 19, 2012, it was observed that the AutoMARK A100 failed to achieve the required 100 dB SPL. The AutoMARK A100 portion of the Acoustic Noise Level Test and Hearing Aid Compatibility was identified as a failure. The highest volume produced by the AutoMARK A100 was 75 dB. It was determined that an update to the firmware of the AutoMARK A100 was needed to achieve the required 100 dB SPL. The firmware was updated and the test was repeated successfully.

Notice of Anomaly No. 10: Acoustic Noise Level Test: After being subjected to the Acoustic Noise Level Test and Hearing Aid Compatibility as performed on June 19, 2012, it was observed that the AutoMARK A200 failed to achieve the required 100 dB SPL. The AutoMARK A200 portion of the Acoustic Noise Level Test and Hearing Aid Compatibility was identified as a failure. The highest volume produced by the AutoMARK A200 was 75 dB. It was determined that an update to the firmware of the AutoMARK A200 was needed to achieve the required 100 dB SPL. The firmware was fixed and the test was repeated successfully.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.9 Anomalies and Resolutions (Continued)

Notice of Anomaly No. 11: Temperature and Power Variation: After completing 18 hours of the scheduled 85 hours of testing, six ballot jams had occurred on one of the DS850 and the testing was halted due to the quantity and frequency of the ballot jams during the test. After inspection by ES&S technicians, it was determined that slight variations within the tolerance of parts on the DS850 can cause the ballot to slightly drift in the ballot path. The ballots are positioned 2mm from the main plate. If the ballots drift too close to the main plate, they can cause jams in the DS850. This anomaly was resolved by installing a 0.012 inch polycarbonate shim beneath the first roller's block at the top. ES&S has written a document for their technicians that detail the required steps to fix this issue. The test was restarted and Wyle did not observe any additional ballots jams from this DS850.

Notice of Anomaly No. 12: Temperature and Power Variation: After completing 18 hours of the scheduled 85 hours of testing, "Camera Interface Error" had occurred on the DS850. Following the System Operating Procedure, the DS850 was shut down and restarted. Upon logging into the DS850, it was observed that "Camera Interface Error" occurred again. It was at this time that testing was halted due to the inability to proceed with the DS850. It was determined that the DS850 suffered "degradation of performance such that the device is unable to perform its intended function for longer than 10 seconds" as identified in VVSG Volume 1, 4.3.3 Reliability. After inspection by ES&S technicians, it was determined that the PCI USB controller caused the error condition. The contacts on the USB controller were in a dull condition. The technician cleaned the contacts with a pencil eraser, and the DS850 did not have this error condition again. ES&S added a cleaning procedure on the PCI USB controller during the manufacturing process to mitigate this issue.

Notice of Anomaly No. 13: Humidity: During the AutoMARK A100 Humidity test performed Nov 16, 2012 – Nov 26, 2012, there was an air pocket affecting the water supply of the test chamber, which caused the test chamber not to reach the required humidity levels. This was found on Saturday Nov 17th. The chamber was inspected by Wyle and the issue was resolved. The test was extended one day to accommodate the delay. The test was completed without any issues. This internal NOA was based on chamber failure, and not a VVSG non-conformity.

Notice of Anomaly No. 14: Temperature and Power Variation: After completing 15 hours of the scheduled 85 hours of testing, switching from 50º F to 95º F and running for 3 hours (300 ballots every hour), the DS850 started out stacking all ballots to the top tray for "decision late". The unit was rebooted and ballots could be scanned normally. On the next hour of scanning 300 ballots again, all ballots were sent to the top tray for "decision late", and rebooting again allowed ballots to be scanned normally. The test was halted. After inspection by ES&S technicians, it was determined that the bottom camera was not working properly causing the error condition when the temperature changed from 50º F to 95º F. The camera was replaced, and the test was restarted and completed successfully. Further analysis of the camera revealed a cold solder joint on the internal board of the camera that caused the error condition when the EUT got hot.

Notice of Anomaly No. 15: Volume and Stress: During the Volume and Stress test on the DS200 an error was encountered during the EQC process. The EQC process failed and would not allow the unit to continue with the only option to shut down the unit. The volume and stress test was broken down into six elections A-F to execute the system limits. Elections A-D operated without issue and the error was encountered during the loading of the "E" election. The following error code was provided: "7101012: EQC data invalid or missing". After analysis by ES&S technicians, removing the USB stick prematurely is the most common cause of this error and was the method used to reproduce the issue. Other possible causes are: EQC media was not fully seated in the USB port causing an intermittent connection failure. A

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.9 Anomalies and Resolutions (Continued)

malfunction occurred in the USB controller that services the port. A malfunction in the USB related hardware on the main board. However, the other possible causes are extremely difficult to reproduce unless the hardware related issues are severe. After Wyle determined that it was not the Volume and Stress elections that caused the error condition, the test was restarted from the beginning, but failed to complete successfully producing NOA 16.

Notice of Anomaly No. 16: Volume and Stress: After the restart of the Volume & Stress test on the DS200 (the same unit that caused NOA 15), the unit would not power up after the execution of Election A. The Volume and Stress test was broken down into six elections A-F to execute the system limits. Election A operated without issue and the unit was powered down so election B could be loaded on the unit. Wyle attempted to power up the unit to load election B three times unsuccessfully. The test was halted and ES&S was notified of the issue. After analysis by ES&S technicians, it was determined from previous experience when the motherboard would not POST (power up), it is likely that the cause was the 5 or 12 volts supplied by the ATX power supply. The ATX power supply was replaced, and Wyle could not reproduce this anomaly. After two anomalies with the same DS200 during this test, this DS200 was removed from the test campaign in accordance with the vendor TDP. This test was restarted from the beginning on a backup DS200 unit and completed successfully with no issues.

Notice of Anomaly No. 17: Source Code Review: Review of the submitted source code comprising the EVS 5.0.0.0 Voting System revealed deviations from the 2005 VVSG as well as issues with the commenting. Upon completion of the review for each source code submission, a technical summary report of all identified standards violations was sent to ES&S for resolution. ES&S then corrected the reported discrepancies and re-submitted the source code for re-review. All discrepancies were resolved by ES&S before the conclusion of the test campaign.

Notice of Anomaly No. 18: Technical Data Package (TDP) Review: Review of the submitted documentation revealed discrepancies between the TDP and the EAC 2005 VVSG requirements. Functional testing also identified text in the TDP that conflicted with the actual operation of the system. Each noted discrepancy was documented in detail in the Wyle-generated TDP review reports on file as raw data. All discrepancies were resolved by ES&S before the conclusion of the test campaign.

4.10 Deficiencies and Resolutions

During the test campaign, deficiencies were noted that were related to system functionality and usability. The deficiencies were discovered as part of the FCA, during hardware test performance, system integration testing, usability testing, volume and stress testing, or were noted during the general test campaign and not linked to a specific test or VVSG requirement. All deficiencies were documented during real-time test performance and were compiled into a report (presented in the Deficiency Report contained in Appendix A.11) for resolution tracking. All deficiencies noted were corrected prior to the conclusion of the test campaign.

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4.11 Recommendation for Certification

Wyle performed conformance/specification testing on the ES&S EVS 5.0.0.0 Voting System to the EAC 2005 VVSG (Version 1.0). During the test campaign, all data from pre-testing, hardware testing, software testing, functional testing, security testing, volume testing, stress testing, usability testing, accessibility testing, and reliability testing activities was combined to ensure all VVSG requirements that are supported by the EVS 5.0.0.0 Voting System had been tested. Wyle also used discretion as granted by the VVSG to design and exercise FCA Test Cases, perform source code reviews, and perform Security Tests.

Wyle concludes that EVS 5.0.0.0 Voting System, submitted by ES&S, meets all applicable requirements for certification as set forth in the Election Assistance Commission (EAC) 2005 Voluntary Voting Systems Guidelines, Version 1.0, as well as all additional tests performed at Wyle's discretion. As such, Wyle recommends that the EAC grant the ES&S EVS 5.0.0.0 voting system, certification to the 2005 VVSG.

This report is valid only for the system identified in Section 2 of this report. Any changes, revisions, or corrections made to the system after this evaluation shall be submitted to the EAC to determine if the modified system requires a new application, or can be submitted as a modified system. The scope of testing required will be determined based upon the degree of modification.

Due to the varying requirements of individual jurisdictions, it is recommended by the EAC 2005 VVSG that local jurisdictions perform pre-election logic and accuracy tests on all systems prior to their use in an election within their jurisdiction.

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APPENDIX A

ADDITIONAL FINDINGS

A.1 NOTICE OF ANOMALY

A.2 HARDWARE TEST REPORT

A.3 FUNCTIONAL CONFIGURATION AUDIT TEST CASE PROCEDURE SPECIFICATION

A.4 SECURITY TEST CASE PROCEDURE SPECIFICATION

A.5 USABILITY TEST CASE PROCEDURE SPECIFICATION

A.6 ELECTION DEFINITIONS

A.7 TECHNICAL DATA PACKAGE REVIEW REPORT

A.7-1 TDP REVIEW SUMMARY
A.7-2 TDP COMPLIANCE MATRIX

A.8 ES&S SOURCE CODE REVIEW REPORT

A.9 PHYSICAL CONFIGURATION AUDIT

A.10 ES&S SECURITY ASSESSMENT REPORT

A.11 DEFICIENCY REPORT

A.12 SUMMATIVE USABILITY REPORTS

A.12-1 AUTOMARK SUMMATIVE USABILITY REPORT
A.12-2 DS200 SUMMATIVE USABILITY REPORT

APPENDIX B

WARRANT OF ACCEPTING CHANGE CONTROL RESPONSIBILITY

ES&S WARRANT OF ACCEPTANCE CHANGE CONTROL

APPENDIX C

WITNESS BUILD

ES&S WITNESS BUILD PROCEDURE

APPENDIX D

WYLE LABORATORIES' CERTIFICATION TEST PLAN NO. T59087-01

ES&S EVS 5.0.0.0 AS RUN TEST PLAN

APPENDIX E

REQUIREMENTS MATRIX

EVS 5.0.0.0 REQUIREMENTS MATRIX

APPENDIX F

ES&S CONFORMITY STATEMENT

ES&S CONFORMITY STATEMENT

APPENDIX G

ES&S ATTESTATION OF DURABILITY

ES&S ATTESTATION OF DURABILITY

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Adjournment

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BOARD MEETING

Tuesday, June 24, 2014
General Assembly Building
Room C
4:00 PM

BOARD WORKING PAPERS
Master Copy
Prepared by Rose Mansfield
Executive Assistant to the Board