



**Report Prepared for the
Texas Secretary of State
Elections Division**



Voting System Certification Evaluation Report

Election Systems and Software (ES&S) EVS 5.2.4.0 Voting System

Introduction

The Election Systems and Software (ES&S) EVS 5.2.4.0 Voting System was evaluated for certification by the State of Texas on July 10, 2018. This report summarizes the findings and observations of the ES&S EVS 5.2.4.0 voting system and its compliance with the requirements of the State of Texas.

Pursuant to Texas Administrative Code §81.60, ES&S submitted their application for state certification. Included with their application was their Technical Data Package (TDP) and their test report, upon which the EAC based their national certification. The EAC/NIST NVLAP accredited Voting System Test Laboratory (VSTL) was Pro V&V, Inc. (Pro V&V).

The EAC certified the system on June 5, 2018. The certification of this system was to the 2005 version of the Voluntary Voting System Guidelines (VVS), see Appendix A - EAC Certificate of Certification.

Two ES&S systems with a lot in common with the current system, the ES&S EVS 5.2.2.0 and ES&S EVS 5.4.0.0 were examined for certification in April 2017, certified on July 28, 2017 with an update to that certification on October 26, 2017. The current system can fairly be characterized as a relatively modest modification of the ES&S EVS 5.2.2.0. This will be further discussed in this report. Because of the significant similarity between the system currently under review and the systems examined in 2017, the findings and recommendations of those examinations generally apply to the current system.

To provide chain-of-custody, a copy of all firmware/software and source code was sent directly from Pro V&V. It was installed in the early part of the examination under the supervision of the Texas examination team.

Recommendation

The ES&S EVS 5.2.4.0 Voting System is recommended for certification. The system was judged to comply with the voting system requirements of the State of Texas.

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This recommendation is being made with the observation that prior versions of the system are being successfully used to run elections, including in Texas. The modifications introduced in this version from previous versions, particularly the ES&S EVS 5.2.2.0, are relatively modest and bring improvements that would be beneficial to the counties that use previous versions of the system.

Observations and Recommendations

The following are observations of and recommendations for the system.

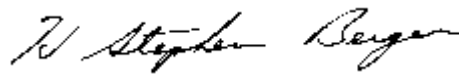
Documentation of Audit Logs

No significant changes were made in the audit log messaging or usability of the audit logs. Therefore, comments about the audit logs made in the examination report of the ES&S EVS 5.2.2.0 also apply to the ES&S EVS 5.2.4.0.

Mark recognition thresholds

No significant changes were made in ballot processing or mark recognition. Therefore, comments on these topics made in the examination report of the ES&S EVS 5.2.2.0 also apply to the ES&S EVS 5.2.4.0.

Sincerely,



H. Stephen Berger

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Candidate System

This section describes the candidate system, the ES&S EVS 5.2.4.0 Voting System.

System Components

The system is comprised of the components listed in Table 1. Figure 1 provides a functional view of the system.¹ A previous ES&S system certified in Texas is shown in Figure 2.

Differences from Prior Versions

ES&S EVS 5.2.4.0 includes a new hardware version of the ExpressVote. This unit is being introduced because some components in the previous version are at their end-of-life and that version is no longer manufacturable.

This system also has updated audio prompts to enhanced support of for voting with a two-position switch, a voting mode provided to support disability access.

Notable differences, shared with the ES&S EVS 5.2.2.0 but different from earlier versions, are the consolidation of several functions into EVM and the absence of the M100 and M650 ballot scanners. EVM is ES&S's newest election management software. It is the next generation, replacing the previous Unity system.

¹ This information is based on the companies "Application for Texas Certification of Voting System" (Form 100).

Table 1 - ES&S Unity 5.2.4.0 System Components

System Components			
#	Unit/Application	Version	Function
Election Management Software			
1	ElectionWare	4.7.1.4	Election Management Software (EMS) end-to-end election management suite.
2	ExpressLink	1.3.0.0	
3	Event Log Service	1.5.5.0	A background function that monitors the proper functioning of the Windows Event Viewer.
4	PaperBallot	4.6.2.0	A ballot utility of ElectionWare
5	Removable Media Service	1.4.5.0	Supports installation and removal of election and results media.
6	Election Reporting Manager (ERM)	8.12.1.0	Results consolidation and reporting software.
7	VAT Previewer	1.8.6.0	Allows user to preview screen layout and audio for the Automark.
8	ExpressVote Previewer	1.4.1.0	Allows user to preview screen layout and audio for the ExpressVote.
9	Toolbox	3.1.0.0	A set of ElectionWare Support Utilities
Universal Voting System			
10	ExpressVote	1.4.1.7	Universal touch-screen vote capture device.
11	ExpressVote	2.4.2.0	Universal touch-screen vote capture device.
Voter Assist Terminal			
12	AutoMARK	1.8.6.1	Accessible ballot marking system.
Ballot Scanners			
13	DS200	1.12.2.0	Precinct ballot tabulator used to process ballots at a polling place.
14	DS450	3.0.0.0	Central ballot scanner.
15	DS850	2.10.2.0	Central ballot scanner.

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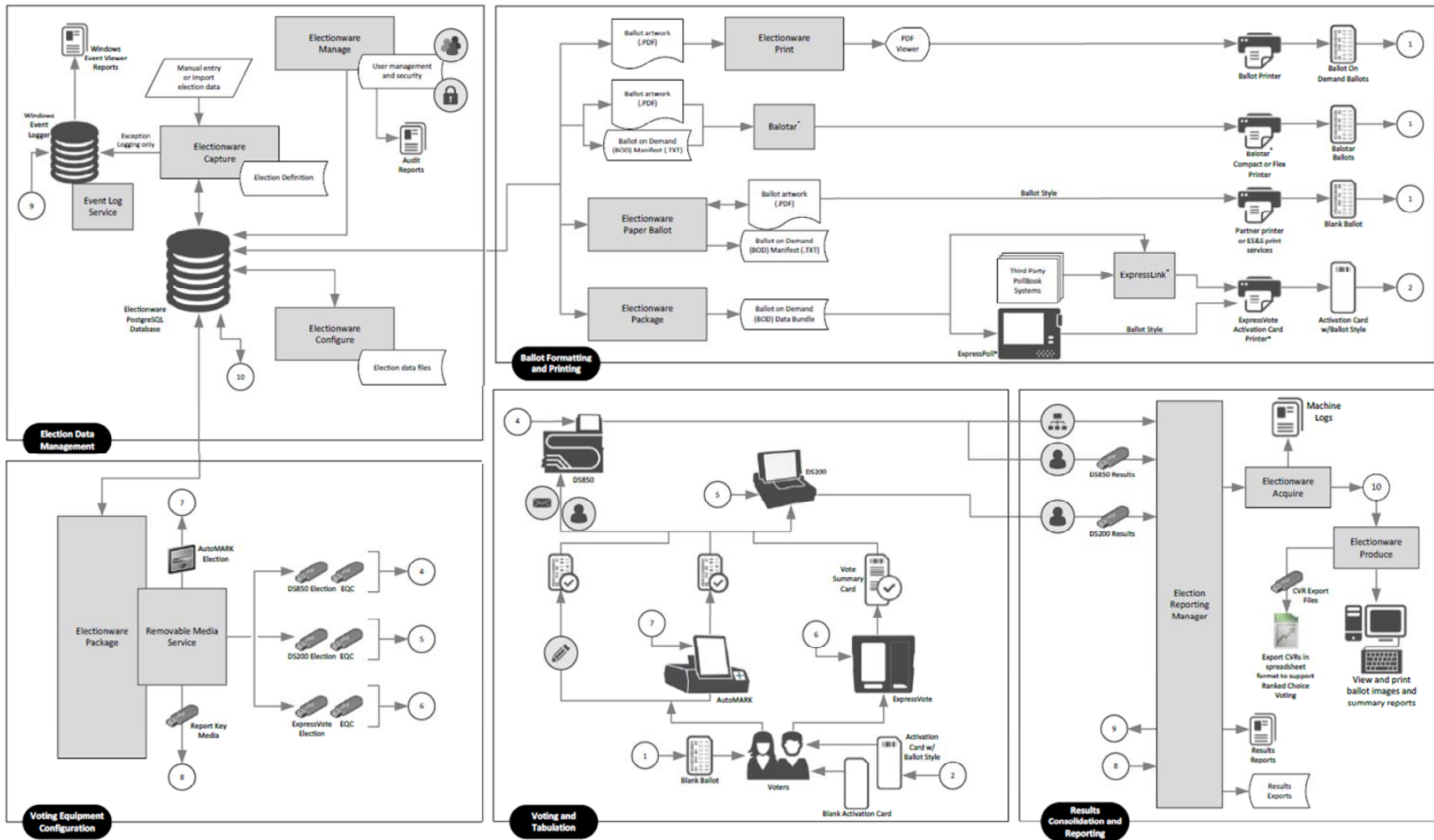


Figure 1 - ES&S Unity 5.2.4.0 Process Flow

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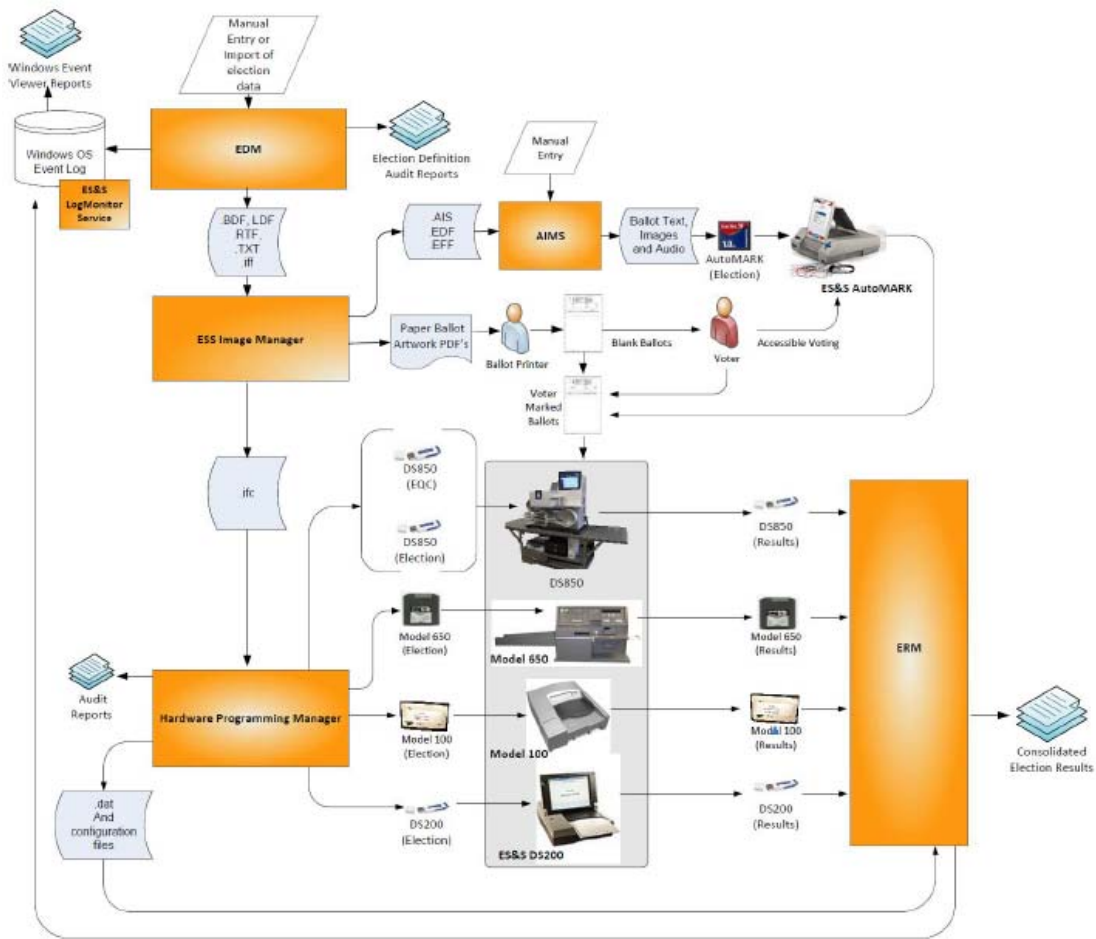


Figure 2 - ES&S Unity 3.4.1.0 Process Flow

Components Not Previously Certified

The following components have not previously been certified in Texas:

System Components		
#	Unit/Application	Version
1	ElectionWare	4.7.1.4
2	ExpressVote	1.4.1.7
3	ExpressVote	2.4.2.0

Comparison to Prior and Successor Systems

The prior ES&S voting system certified in Texas was the EVS 5.2.2.0, certified on July 28, 2017 with an update to that certification on October 26, 2017.

This release introduces a new hardware version for the ExpressVote® Universal Voting System that addresses end-of-life components and provides improved manufacturability.

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EVS5240 adds four new ExpressVote configuration options:

- Quad Express Cart,
- MXB ExpressVote Voting Booth,
- ExpressVote Single Table and
- ExpressVote Double Table.

It also adds a new ADA table configuration for the AutoMARK[®] Voter Assist Terminal and a new collapsible ballot box for the DS200[®].

This release also provides security upgrades to the COTS products.

Comparison to Previous Version						
#	Unit/Application	3.0.1.1 Version	3.4.1.0 Version	5.2.1.0 Version	5.2.2.0 Version	5.2.4.0 Version
1	Unity	3.0.1.1	3.4.1.0			
2	EVS			5.2.1.0	5.2.2.0	5.2.4.0
Election Management Software						
3	ElectionWare			4.7.1.0	4.7.1.1	4.7.1.4
4	Election Data Manager (EDM)	7.4.4.0	7.8.2.0			
5	Election Reporting Manager (ERM)	7.1.2.1	7.9.0.0	8.12.1.0	8.12.1.1	8.12.1.1
6	ES&S Image Manager (ESSIM)	7.4.2.0	7.7.2.0			
7	Hardware Programming Manager (HPM)	5.2.4.0	5.9.0.0			
8	Audit Manager (AM)	7.3.0.0	7.5.2.0			
9	Log Monitor Service		1.1.0.0			
10	VAT Previewer		1.3.2907	1.8.6.0	1.8.6.1	1.8.6.1
11	Event Log Service			1.5.5.0	1.5.5.0	1.5.5.0
12	ExpressVote			1.4.1.0	1.4.1.2	1.4.1.7 & 2.4.2.0
13	ExpressVote Previewer			1.4.1.0	1.4.1.2	1.4.1.7 & 2.4.2.0
	ExpressLink					1.3.0.0
14	Removable Media Service			1.4.5.0	1.4.5.0	1.4.5.0
AutoMark						
15	AutoMARK	1.1.2258	1.3.2907		1.8.6.1	1.8.6.1
16	AIMS	1.2.18	1.3.257			
Ballot Scanners						
17	M100	5.2.1.0	5.4.4.5			
18	M650	2.1.0.0	2.2.2.0			
19	DS200		1.7.0.0	2.12.1.0	2.12.2.0	2.12.2.0
20	DS450				3.0.0.0	3.0.0.0
21	DS850		2.9.0.0	2.10.1.0	2.10.2.0	2.10.2.0

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ES&S has received EAC national certification for several preceding and successor systems, see Table 2.

Table 2 – Recently EAC Certified ES&S Systems

Predecessor Voting Systems		
#	System	Date of EAC Certification
1	EVS 5.0.0.0	May 16, 2013
2	EVS 5.0.1.0	March 18, 2014
3	EVS 5.2.0.0	July 2, 2014
4	EVS 5.2.0.3	August 5, 2015
5	EVS 5.2.0.4	April 27, 2016
6	EVS 5.2.1.0	December 18, 2015
7	EVS 5.2.1.1	May 4, 2016
Voting Systems Being Examined		
8	EVS 5.2.2.0	February 27, 2017
Successor Voting Systems		
#	System	Date of EAC Application
9	EVS 5.4.0.0	February 24, 2017

The EAC Certification Certificate states that the following differences and improvements are introduced by the EVS 5.2.2.0, as compared to its predecessor EVS 5.2.0.0 system:

The EVS 5.2.4.0 is a modified voting system configuration that includes upgrades to the components of the EVS 5.2.3.0 and introduces a new hardware version for the ExpressVote (versions 2.1.0.0 and 2.1.2.0). EVS 5.2.4.0 adds four new ExpressVote configuration options: Quad Express Cart, MXB ExpressVote Voting Booth, ExpressVote Single Table and ExpressVote Double Table. EVS 5.2.4.0 also adds a new ADA table configuration for the AutoMARK; provides security upgrades to third-party EMS COTS products; and contains minor enhancements to Electionware and ExpressVote..

Important insights for the evaluation of the ES&S EVS 5.2.4.0 can be gained by comparing it to its predecessor and successor systems.

Many components are common to the version of the system previously certified in Texas. It may be assumed that the experience using the prior version of the system will be similar to that of the new system. However, some prior issues in earlier versions of the system have been resolved. These may be identified by studying the change log and engineering change orders on the system

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from the Unity 3.0.1.1 version through the EVS 5.2.2.0 version to the EVS 5.2.4.0, the subject of this report.

It is noteworthy that the Automark is no longer being manufactured.

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System Limits

System Limitation

The system has the following limitations, per the EAC certificate of certification:

Table 3 – ES&S Unity 3.4.1.0, EVS 5.2.2.0 & EVS 5.2.4.0 System Limits²

System Limits					
#	System Variable	System Limit			Limiting Component
		Unity 3.4.1.0	EVS 5.2.2.0	EVS 5.2.4.0	
1	Precincts in an election	9,900	9,900	9,900	ERM
2	Maximum count for any precinct element	500,000 65,500 for any tabular media	500,000 65,500 for any tabular media	500,000 99,900 for any tabular media	ERM
3	Candidates per election (max. counters)	21,000 ³	21,000 ³	21,000 ³	ERM
4	Contests per election (max. counters)	21,000 ⁴	21,000 ⁴	21,000 ⁴	ERM
5	Maximum counters per precinct	1,000	1,000	1,000	ERM
6	Contests allowed per ballot style	200	200	200	N/A
7	Candidates (ballot choices) per contest	175	175	175	ERM
8	Parties in a General Election	75	75	75	ERM
9	Parties in a Primary Election	20	20	20	ERM
10	Choices in a Contest	98	98	98	ERM
11	Ballot Formats	All paper ballots must be the same size and	All paper ballots must be the same size and contain the	All paper ballots must be the same size and contain the	Scanner

² EAC Scope of Certification for the ES&S EVS 5.2.4.0 Voting System.

³ The number of contests allowed in an election depends on the election content. The maximum number of counters is 21,000. An example of a maximum contest calculation is: 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 $(\text{counter limit} - \text{statistics} \times 2)/\text{number of counters/contest} = \text{number of contests}$.

⁴ Contest counters are calculated as indicated in footnote 3, 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."

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System Limits					
#	System Variable	System Limit			Limiting Component
		Unity 3.4.1.0	EVS 5.2.2.0	EVS 5.2.4.0	
		contain the number of response rows.	number of response rows.	number of response rows.	
12	Ballot styles	9,900	9,900	9,900	ERM
13	District types/groups	20	20	20	ERM
14	Districts of a given type	40 ⁵	40 ⁵	40 ⁵	ERM
15	Languages supported	<ul style="list-style-type: none"> • English • Spanish • Chinese • Korean • Bengali 	<ul style="list-style-type: none"> • English • Spanish • Chinese • Korean • Japanese • Bengali 	<ul style="list-style-type: none"> • English • Spanish • Chinese • Korean • Japanese • Bengali 	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

1. 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

1. 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 .

⁵ Excludes the Precinct Group which contains all precincts.

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ElectionWare

1. 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.

ExpressVote

1. ExpressVote 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 ExpressVote system as the maximum capacities of the ES&S ExpressVote are never approached during testing.

Election Reporting Manager (ERM)

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
2. XML results file out of ERM.
7. ERM's maximum page size for reports is 5,000 pages.

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Use in other States

Further, the ES&S EVS 5.2.4.0 or very closely related versions of the system has been deployed and are being used successfully in other states. The EAC maintains an interactive map identifying jurisdictions that are using EAC certified systems, Table 4. They also maintain a report database of problems reported by election officials with certified systems. These resources were consulted and are the basis for this statement.

Table 4 – EAC list of jurisdictions using closely related versions of the EVS 5.2.4.0 system⁶

County	State	EAC Certified	
		Voting System	System Components
Pinal	AZ	ES&S EVS 5.0.0.0	
Canyon	ID	ES&S EVS 5.0.0.0	
Virgin Islands	VI	ES&S EVS 5.0.0.0	
Lewis	WV	ES&S EVS 5.0.0.0	
Pima	AZ	ES&S EVS 5.2.0.0 Mod	
Cassia	ID	ES&S EVS 5.2.0.0 Mod	
GEM	ID	ES&S EVS 5.2.0.0 Mod	
Madison	ID	ES&S EVS 5.2.0.0 Mod	
Hinds	MS	ES&S EVS 5.2.0.0 Mod	
Cuyahoga	OH	ES&S EVS 5.2.0.0 Mod	
Lane	OR	ES&S EVS 5.2.0.0 Mod	
Tillamook	OR	ES&S EVS 5.2.0.0 Mod	
Harrison	WV	ES&S EVS 5.2.0.0 Mod	
Allegany	MD	ES&S EVS 5.2.0.3 Mod	
Anne Arundel	MD	ES&S EVS 5.2.0.3 Mod	
Baltimore	MD	ES&S EVS 5.2.0.3 Mod	
Baltimore (city)	MD	ES&S EVS 5.2.0.3 Mod	
Calvert	MD	ES&S EVS 5.2.0.3 Mod	
Caroline	MD	ES&S EVS 5.2.0.3 Mod	
Carroll	MD	ES&S EVS 5.2.0.3 Mod	
Cecil	MD	ES&S EVS 5.2.0.3 Mod	

⁶ The EAC maintains a list of jurisdictions using EAC certified systems. This data was Dated March 25, 2017 and is the source of the data in this table. The URL for the complete list is:

https://www.eac.gov/assets/1/6/Voting_System_Map_Locations-03-25-17.pdf

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County	State	EAC Certified	
		Voting System	System Components
Charles	MD	ES&S EVS 5.2.0.3 Mod	
Dorchester	MD	ES&S EVS 5.2.0.3 Mod	
Frederick	MD	ES&S EVS 5.2.0.3 Mod	
Garrett	MD	ES&S EVS 5.2.0.3 Mod	
Harford	MD	ES&S EVS 5.2.0.3 Mod	
Howard	MD	ES&S EVS 5.2.0.3 Mod	
Kent	MD	ES&S EVS 5.2.0.3 Mod	
Montgomery	MD	ES&S EVS 5.2.0.3 Mod	
Prince Georges	MD	ES&S EVS 5.2.0.3 Mod	
Queen Annes	MD	ES&S EVS 5.2.0.3 Mod	
Somerset	MD	ES&S EVS 5.2.0.3 Mod	
St. Marys	MD	ES&S EVS 5.2.0.3 Mod	
Talbot	MD	ES&S EVS 5.2.0.3 Mod	
Washington	MD	ES&S EVS 5.2.0.3 Mod	
Wicomico	MD	ES&S EVS 5.2.0.3 Mod	
Worcester	MD	ES&S EVS 5.2.0.3 Mod	
Arkansas	AR	ES&S EVS 5.2.1.0 Mod	
Boone	AR	ES&S EVS 5.2.1.0 Mod	
Chicot	AR	ES&S EVS 5.2.1.0 Mod	
Cleveland	AR	ES&S EVS 5.2.1.0 Mod	
Columbia	AR	ES&S EVS 5.2.1.0 Mod	
Garland	AR	ES&S EVS 5.2.1.0 Mod	
Jackson	AR	ES&S EVS 5.2.1.0 Mod	
Sebastian	AR	ES&S EVS 5.2.1.0 Mod	
Yell	AR	ES&S EVS 5.2.1.0 Mod	
Apache	AZ	ES&S EVS 5.2.1.0 Mod	
Gila	AZ	ES&S EVS 5.2.1.0 Mod	
Graham	AZ	ES&S EVS 5.2.1.0 Mod	
Brown	KS	ES&S EVS 5.2.1.0 Mod	
Finney	KS	ES&S EVS 5.2.1.0 Mod	
Leavenworth	KS	ES&S EVS 5.2.1.0 Mod	
Norton	KS	ES&S EVS 5.2.1.0 Mod	

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County	State	EAC Certified	
		Voting System	System Components
Shawnee	KS	ES&S EVS 5.2.1.0 Mod	
Wichita	KS	ES&S EVS 5.2.1.0 Mod	

In addition to those jurisdictions use the system or a closely related version, the ES&S EVS 5.2.4.0 has been certified in a number of other states, Table 5. The certification examinations by these states add to the confidence given by the EAC certification that the system meets requirements. Further, it is quite probable that the system will be put to use in many, if not all, of these states. Widespread use increases the probability that if the system has deficiencies, they will be identified. While the Texas exam was conducted independently, the conclusion that the system meets requirements is increased by the similar conclusions of other states.

Table 5 – States that have certified the EVS 5.2.4.0 system or closely related versions of it⁷

State	Voting System Version Certified
AR	EVS 5.2.1.0 – certified 1/29/2016
AK	EVS 5.2.1.0 – certified 6/25/2016
AZ	EVS 5.2.1.0 – certified 02/02/2016
DC	EVS 5.3.1.0 – certified 02/05/2016
FL	EVS 4.5.2.0 – certified 6/16/2016 (FL release similar to EVS 5.2.1.0)
IA	EVS 5.3.1.0 – certified 03/25/2016
ID	EVS 5.2.0.0 – certified 08/13/2014, certification of EVS 5.2.1.0 underway
IL	EVS 5.3.0.0 – certified 9/21/2015, certification of EVS 5.3.1.0 underway
IN	EVS 5.2.0.0 – certified 4/24/2015, certification of EVS 5.2.1.0 underway
KS	EVS 5.2.1.0 – certified 4/07/2016
KY	EVS 5.2.0.0 – certified 3/17/2015 (no installations yet)
ME	EVS 5.2.1.0 – certified 1/29/2016
MD	EVS 5.2.0.3 – certified 8/7/2015
MN	EVS 5.3.0.0 – certified 8/3/2015, certification of EVS 5.3.1.0 underway (excludes Express Vote)
MS	EVS 5.2.1.0 & EVS 5.2.1.0 (no installations yet)

⁷ Information in this table was provided by Steve Pearson of ES&S in an E-Mail.

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State	Voting System Version Certified
MO	EVS 5.2.0.0 – certified 6/26/2016, certification of EVS 5.2.1.0 underway
NJ	EVS 5.3.0.0 certified 6/26/2015
NY	EVS 5.6.0.1 New York specific release, certified 2/23/2016
OH	EVS 5.2.1.0 – certified 1/21/2016
OR	EVS 5.2.0.0 certified 8/28/2014
RI	EVS 5.3.1.0 certified 5/2/2016 (excludes Express Vote)
SD	EVS 5.2.0.3 certified 10/19/2015 (no installations yet)
TN	EVS 5.2.0.0 certified 10/12/2015, certification of EVS 5.2.1.0 underway
VA	EVS 5.2.0.2 certified 5/13/2015
VI	EVS 5.2.1.0 – certified 6/13/2016
WA	EVS 5.2.0.0 – certified 4/1/2015
WV	EVS 5.2.1.0 – certified 5/31/2016
WI	EVS 5.2.0.0/5.3.0.0 – certified 9/4/2014
WY	EVS 5.2.0.0 – certified 3/6/2015, certification of EVS 5.2.1.0 underway

Examination Report

Description of the Examination

The examination occurred on July 10, 2018. It was preceded by the delivery of the companies Forms 100 and 101, Technical Data Package, authorization letters and related documents. The system software and firmware was provided directly from the VSTL that had examined the system to the VVSG for national certification.

The technical examiners and members of the election division staff observed and verified the installation of the vendor's software. Digital signatures were recorded of the software provided by Pro V&V and the software and firmware was installed onto the system. Photos of the equipment and labels were taken and where hardware and firmware versions could be provided either on a screen or printed, those were produced and recorded.

ES&S staff reviewed the ES&S EVS 5.2.4.0, including its configuration and the function and role of the various components in the voting system. An overview was provided of the changes from the last version certified in Texas, the ES&S EVS 5.2.2.0.

The examiners tested each piece of equipment using a pre-marked "test deck" of ballots. The test deck had been hand tallied by staff from the Secretary of State's office on ballots provided by the vendor. Voted ballots were tabulated through the DS200 (precinct ballot counter) and DS850

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(central tabulator). The tabulation reports from the DS200 and DS850 all matched and were correct.

Observations & Findings

System Verification

The process for verifying the system is time consuming, complex and required partially disassembling some units. Further information and discussion are provided in Appendix B - Digital Signatures of Software Examined. It does not appear to be reasonable to expect these checks to be performed routinely. This is unfortunate as one purpose of the software verification is to document that the software and firmware used in an election is unchanged from that which was certified

Audit Logs

Because the audits logs are critical records for evidence based elections, their thoroughness and clarity continue to be topics of importance.

The audit logs continue to develop and improve, which is appreciated. However, as will be commented, further improvement, particularly in the documentation of how to gather logs and evaluate them is needed.

The system logs continue to change and develop. There is a very significant increase in the number of events identified and recorded, as seen in Table 6.

Table 6 – DS200 Log Messages

DS200 Defined Log Messages										
Unity Systems						EVS System				
3.0.1.1 Amd A	3.2.0.0 Rev. 1	3.2.0.0 Rev. 2	3.4.0.0	3.4.1.0	3.4.1.4	5.0.0.0	5.2.1.0	5.2.2.0	5.2.4.0	5.4.0.0
155	155	125	257	250	255	449	485	907	907	914

The increase in the detail recorded in the logs is positive because it means that more information about equipment errors or misuse will be recorded and available when needed. The growth has primarily been in the number of errors that have defined messages, Table 7. For example, the Unity 3.4.0.0 system defined messages for 114 events and 143 errors. The EVS 5.2.1.0 system added only 2 event messages but 227 error messages. With the EVS 5.2.2.0 system 84 new event messages were defined but 337 new error messages were added. The EVS 5.2.4.0 system had the same 200 event messages and 707 error messages as the EVS 5.2.2.0 system.

Table 7 – DS200 Event & Error Messages

DS200 Event & Error Messages				
	Unity 3.4.0.0	EVS 5.2.1.0	EVS 5.2.2.0	EVS 5.2.4.0

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Events	114	116	200	200
Errors	143	370	707	707
Total	257	486	907	907

As seen in Table 6, the number of messages has grown from 155 to 486 messages for the current version. In the Unity 3.4.1.0 version errors and events are differentiated. In that version of the DS200 114 of the 276 log messages were error messages and 162 were event messages that were logged. The EVS 5.2.4.0 version does not differentiate events from errors, listing them together. However, the action for 116 messages is given as "No action necessary" or "No action is needed."

In the EVS 5.2.4.0 the corrective action for ~60% of the errors, or 422 of the error events, is given as: "Contact ES&S technical support." This is a very serious deficiency for two important reasons. First, no information is provided about what the potential impact was to the accuracy of the election. Should there be any steps taken by election officials in response to the error to confirm the accuracy of the tally? The second problem is that it encourages an unhealthy dependence on the vendor. While vendor support is essential, election officials need to know how their systems are functioning and when there are problems, what those problems are.

A further problem is that in contrast to the treatment of the iVotronic DRE in Unity 3.0.1.1 the Unity 5.2.4.0 makes analysis of the audit logs so labor intensive as to be prohibitive. In the Unity 3.0.1.1 system all iVotronic logs are gathered along with their vote tallies and a composite output of all the logs can be provided. This allows for quick and automatic scanning of the full set of audit log files to see if any of the units reported errors or abnormal events. In contrast the DS200 only provide a printout of their logs. These units are used in large numbers in some jurisdictions. Like any mechanical or electrical device, some units will have problems. The inability to have the logs electronically for timely review and appropriate remediation of problems is a major deficiency to election administration.

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```
Vote Session Started
14:45:56 06/09/2016 3004101
IMR Log Characteristic Point Status Init 18 New 18
14:46:01 06/09/2016 1004109
Voter Accepted Undervoted Ballot
14:46:01 06/09/2016 1004107
Ballot images stored
14:46:02 06/09/2016 1004022
Voting session complete
14:46:06 06/09/2016 1004115
Vote Session Started
14:46:08 06/09/2016 3004101
IMR Log Characteristic Point Status Init 18 New 18
14:46:13 06/09/2016 1004109
Voter Accepted Undervoted Ballot
14:46:14 06/09/2016 1004107
Ballot images stored
14:46:14 06/09/2016 1004022
Voting session complete
14:46:18 06/09/2016 1004115
```

Figure 3 – Sample from a DS200 event log

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```
13:52:18 Wed Jun 08 2016 Ballot Spec ID: DSIM 355.600_215.900_41_24_PP
13:52:18 Wed Jun 08 2016 Load election definition OK
13:52:19 Wed Jun 08 2016 Audit log printer is ready
13:52:19 Wed Jun 08 2016 Set Scanner IP Address successful
13:52:22 Wed Jun 08 2016 Selected: Load Election done
13:52:23 Wed Jun 08 2016 Navigated to: Setup Menu
13:52:25 Wed Jun 08 2016 DS850 Memory stick removed
13:59:14 Wed Jun 08 2016 Navigated to: Election Menu
13:59:19 Wed Jun 08 2016 Navigated to: Scanning Menu
13:59:20 Wed Jun 08 2016 Selected: Scan Ballots
13:59:21 Wed Jun 08 2016 Selected: Start Scanning
13:59:22 Wed Jun 08 2016 Pick delay: 0 ms
13:59:22 Wed Jun 08 2016 Initial ballot number: 000001
13:59:34 Wed Jun 08 2016 Successfully moved 17 ballots to temp storage
13:59:34 Wed Jun 08 2016 Number of counted ballots (bottom + middle bins) moved: 17
13:59:40 Wed Jun 08 2016 Selected: Done Scanning
13:59:41 Wed Jun 08 2016 Selected: Save Batch
13:59:41 Wed Jun 08 2016 Batch id batch_2016-06-08T13_59_41 successfully saved
13:59:41 Wed Jun 08 2016 Number of Processed ballots (bottom bin) in batch: 17
13:59:41 Wed Jun 08 2016 Number of Sorted Write-in ballots (middle bin) in batch: 0
13:59:41 Wed Jun 08 2016 Number of Outstack ballots (top bin) in batch: 0
13:59:46 Wed Jun 08 2016 Selected: Scan
```

Figure 4 – Sample from a DS850 event log

Message Code	Date	Time	Media Serial Number	Log Type	Poll Place Name	Machine Serial Number	Message
6004118	2017-04-19	11:15:23	AA04012700016135	P_LOG	ALL POLL	0316370441	Motherboard VT6070
1004002	2017-04-19	11:15:36	AA04012700016135	P_LOG	ALL POLL	0316370441	Election loaded
1004326	2017-04-19	11:15:39	AA04012700016135	P_LOG	ALL POLL	0316370441	All data paths and memory locations OK
1004143	2017-04-19	11:15:39	AA04012700016135	P_LOG	ALL POLL	0316370441	Printing 1 copy of Configuration Report
1004128	2017-04-19	11:16:00	AA04012700016135	P_LOG	ALL POLL	0316370441	Completed printing Configuration Report
1004302	2017-04-19	11:16:00	AA04012700016135	P_LOG	ALL POLL	0316370441	DS200/UVC not plugged in
1004016	2017-04-19	13:33:36	AA04012700016135	P_LOG	ALL POLL	0316370441	Shutdown initiated
6004118	2017-04-19	13:47:45	AA04012700016135	P_LOG	ALL POLL	0316370441	Motherboard VT6070
1004002	2017-04-19	13:47:57	AA04012700016135	P_LOG	ALL POLL	0316370441	Election loaded
1004326	2017-04-19	13:48:00	AA04012700016135	P_LOG	ALL POLL	0316370441	All data paths and memory locations OK
1004143	2017-04-19	13:48:00	AA04012700016135	P_LOG	ALL POLL	0316370441	Printing 1 copy of Configuration Report
1004128	2017-04-19	13:48:18	AA04012700016135	P_LOG	ALL POLL	0316370441	Completed printing Configuration Report
1004302	2017-04-19	13:48:19	AA04012700016135	P_LOG	ALL POLL	0316370441	DS200/UVC not plugged in
1004149	2017-04-19	13:48:26	AA04012700016135	P_LOG	ALL POLL	0316370441	Attempting to Open Poll
6004022	2017-04-19	13:48:28	AA04012700016135	P_LOG	ALL POLL	0316370441	Open process complete.
6004121	2017-04-19	13:48:28	AA04012700016135	P_LOG	ALL POLL	0316370441	Keys detected on poll media 0316370379
1004003	2017-04-19	13:48:29	AA04012700016135	P_LOG	ALL POLL	0316370441	Poll opened
1004143	2017-04-19	13:48:31	AA04012700016135	P_LOG	ALL POLL	0316370441	Printing 1 copy of Zero Totals Report
1004128	2017-04-19	13:49:04	AA04012700016135	P_LOG	ALL POLL	0316370441	Completed printing Zero Totals Report
1004152	2017-04-19	13:50:41	AA04012700016135	P_LOG	ALL POLL	0316370441	Attempting to enter Voting Mode
1004056	2017-04-19	13:50:41	AA04012700016135	P_LOG	ALL POLL	0316370441	Entering voting mode
1004115	2017-04-19	14:36:56	AA04012700016135	P_LOG	ALL POLL	0316370441	Vote Session Started
1004500	2017-04-19	14:36:59	AA04012700016135	P_LOG	ALL POLL	0316370441	ExpressVote Card Detected
3004101	2017-04-19	14:36:59	AA04012700016135	P_LOG	ALL POLL	0316370441	IMR Log Characteristic Point Status
1004107	2017-04-19	14:37:00	AA04012700016135	P_LOG	ALL POLL	0316370441	Ballot images stored

Figure 5 – Sample from an EVS 5.2.2.0 Electionware log

Figure 3 is an image of a section of a DS200 log. Figure 4 is an image of a section of a DS850 log. Figure 5 is an image of a system log. As can be seen, entirely different messaging and arrangements are used even within the same system. To effectively use the logs an election

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official would first need to learn how to obtain the different kinds of logs. The DS200 has 2 different logs, a system log and an event log. The DS850 has more logs than that. The system adds further to the number and variation in the logs. How clear and usable these logs are to the typical election official is a significant question.

The lack of clear documentation and guidance on how to use the logs or the meaning of their messages creates a serious question about their utility. In a contested election, the ability of the average election official to understand the logs and use them as evidence is suspect.

The company does offer an extra service of analyzing logs for election officials. While often helpful there is an inherent conflict of interest in the company reporting on the performance of its own equipment. A further negative to analysis of logs as an extra service is that it closes off one of the most useful applications, which is to get early notice of events from the logs, in time for corrective action to be taken, in some cases before the election is completed. Some events should trigger alerts, so that election officials can correct a condition rather than try and reconstruct the situation after the fact.

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Compliance Checklist

The following checklist includes all Texas voting system requirements.

The checklist is provided as detailed support for the conclusion and recommendation of this report.

Category	Source of Law	Requirement	Assessment Method	Compliant		Notes
General Requirements	122.001(a)(1)	Must preserve the Secrecy of the Ballot	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
	122.001(a)(2)	Must be suitable for the purpose for which it is intended	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
	122.001(a)(3)	Operates safely, efficiently, and accurately and complies with the voting system standards adopted by the EAC.	EAC Certification #	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	EAC Certification Number: ESSEVS5240
	122.001(a)(4)	Is safe from fraudulent or unauthorized manipulation	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
	122.001(a)(5)	Permits voting on all offices and measures to be voted on at the election.	L&A test	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
	122.001(a)(6)	Prevents counting votes on offices and measures on which the voter is not entitled to vote	L&A Test	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
	122.001(a)(7)	Prevents counting vote by the same voter for more than one candidate for the same office or, in elections in which a voter is entitled to vote for more than one candidate for the same office, prevents counting votes for more than the number of candidates for which the voter is entitled to vote.	L&A Test	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
	122.001(a)(8)	Prevents counting a vote on the same office or measure more than once	L&A Test	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
	122.001(a)(9)	Permits write-in voting	L&A Test	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

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122.001(a)(10)	Is capable of permitting straight-party voting (See also, Straight Party Voting in checklist)	L&A Test	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
122.001(a)(11)	Is capable of providing records from which the operation of the voting system may be audited.	Review of Audit Logs	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
122.001(e)	For an election for federal office in which a state or federal court order has extended the time for voting beyond the time allowed by Subchapter B, Chapter 42, a voting system must provide a separate count of the votes cast after the time allowed by that subchapter.	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
122.033(1)	Must be equipped with a security system capable of preventing operation of the machine	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
122.033(2)	Must be equipped with registering counter that can be secured against access	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
122.033(3)	Must be equipped with a public counter	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
122.033(4)	Voting system must be equipped with a protective counter.	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
122.0331(a)	Copies of program codes and other user and operator manuals and copies or units of all other software and any other information, specifications, or documentation required by the SOS related to an approved electronic voting system and its equipment must be filed with the Secretary.	Certification Packet	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
122.001(d)(2)	Must not use a punch-card ballot or similar form of tabulating	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
122.001(d)1)	Must not be a mechanical voting machine	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

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127.1231	Procedure to ensure that any computer terminals located outside the central counting station that are capable of accessing the automatic tabulating equipment during the tabulation are capable of inquiry functions only	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
127.1231	No modem access to the tabulating equipment is available during the tabulation	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
129.054	A voting system may not be connected to any external communications network, including the internet.	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
	A voting system may not have the capability or permitting wireless communication unless the system uses line-of-sight infrared technology that shields the transmitter and receiver from external infrared transmission and the system can only accept transmissions generated by the system.	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
85.032	Ballot box in which voters deposit their marked EV ballots must have two locks, each with a different key and must be designed and constructed to that the box can be sealed to detect any unauthorized opening of the box and that the ballot slot can be sealed to prevent any unauthorized deposit in the box.	Review of Equipment	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
127.154	Each unit of automatic tabulation equipment must have a permanent identification number Each part of that equipment that contains the ballot tabulation must also have a permanent identification number.	Review of Equipment	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
272.005	Ballots must be printed with all ballot instructions, office titles, column headings,	Review Ballot	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

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		proposition heading, and propositions appearing in English and Spanish.			
	129.055	The sole purpose of voting system equipment is the conduct of an election, and only software certified by the SOS and necessary for an election may be loaded on the equipment.	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	11.054, Education Code	Must allow for cumulative voting.	General Review	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Straight-Party Voting	122.001(b)	Must be capable of allowing straight party voting in accordance with 65.007(c) and (d)	L&A test	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	65.007 (c)	If a ballot indicates a straight-party vote and a vote for an opponent of one or more of that party's nominees, a vote shall be counted for the opponent and for each of the party's other nominees whether or not any of those nominees have received individual votes. (cross-over voting)	L&A test	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	65.007 (d)	If a ballot indicates straight-party votes for more than one party, those votes may not be tallied. Only candidates receiving individual votes will be counted.	L&A test	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Ballot Requirements	43.007	DRE's only authorized for CWPP --- must have the capability of more than 1 ballot style.		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	124.001	In an election in which voters are entitled to cast straight-party votes, the voting system ballot shall be arranged to permit the voters to do so.	Review of Ballot	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	124.002(a)	In an election in which a candidate's name is to appear on the ballot as the nominees of a political party, the voting system ballot shall be arranged	Review of Ballot	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

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	(1) in party column in the same manner as for a regular paper ballot, or (2) by listing the office titles in a vertical column in the same manner as for a regular paper ballot on which a party nominee does not appear, except that the nominees' party alignment shall be indicated next to their names.			
124.002(b)	The order in which party nominees listed by office title appear on a voting system ballot is determined in accordance with the same priorities and in the same manner as for party nominees listed in party column, with the changes appropriate to the circumstances.	Review of Ballot	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
124.062(b)	The SOS may authorize the use of electronic system ballots that comprise two or more separate parts and may prescribe conditions and limitation under which the multipart ballots may be used. Multipart ballots must comply with the same standards as a voting system using a ballot consisting only of a single part. (See op scan ballot requirements in TAC rules 81.43 – at end of checklist.)	Review of Ballot	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
124.063	Certain Instructions Required on Electronic Voting System Ballot -- "Vote for the candidates of your choice in each race by making a mark in the space provided adjacent to the name of that candidate" "Make a mark in the space provided beside the statement indicating the way you desire to vote"	Review of Ballot	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

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		(b) Instructions can be changed in certain circumstances (c) Must contain instructions for casting a write-in vote. SOS will prescribe wording. (d) Must contain instruction under Section 52.071(b) of the code for straight party voting. (Vendor must show that instructions are customizable to fit appropriate ballot)			
	129.002(a) (DRE Only)	Each direct recording electronic voting machine must provide the voter with a screen in summary format of the voter's choices for the voter to review before the vote is actually cast.	Review of Summary Screen	Yes <input type="checkbox"/> No <input type="checkbox"/>	N/A – System does not have a DRE.
Provisional Ballots	124.006	The SOS shall prescribe the form of a provisional ballot and the necessary procedure to implement the casting of a provisional ballot as described by Section 63.011 and the verification and processing of provisional ballots under Subchapter B, Chapter 65.	Review Provisional Ballot	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
	52.074	The authority responsible for having the official ballot prepared shall have a provisional ballot prepared in a form approved by the Secretary of State for use by a voter who executed an affidavit in accordance with Section 63.011 of the Code. <u>(NOTE: Need to show SOS how provisional ballot works)</u>	Review Provisional Ballot	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
	81.173, TAC (DRE ONLY)	Provisional ballots may be cast electronically on a Direct Record Electronic (DRE) voting system if: (C) the system segregates provisional votes	Review Provisional Ballot	Yes <input type="checkbox"/> No <input type="checkbox"/>	N/A – System does not have a DRE.

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		<p>from regularly-cast votes on the precinct returns; and</p> <p>(D) the system provides a method for the cast provisional ballots to be accepted and added to the election results by the Early Voting Ballot Board or central counting station personnel, as applicable.</p>			
	127.063	<p>Sealed ballot box must be:</p> <ol style="list-style-type: none"> 1. Equipped with a lock to prevent opening the box without a key 2. Ballots can be deposited and delivered w/o damage 3. Box can be sealed to detect any unauthorized opening of the box 4. Slot used by the voters to deposit ballots can be sealed to prevent any unauthorized deposit in the box. <p>NOTE: for Ballots to be counted at CCS.</p>	Review of Equipment	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	
Optical scan Systems	81.43, TAC	<ol style="list-style-type: none"> 1. Optical scanner ballots may be divided into parts and printed upon two or more pages. 2. When party columns appear on the ballot, the names of the parties and spaces for voting a straight-party ticket must be printed out the head of the ballot so the voter may cast a straight ticket by making a single mark on the first page. 3. Where all candidates for the same office cannot be placed on the same face of the same page, the names can appear on more than one page, but the first page must contain a statement that the names of other candidates appear on the following pages(s). 4. If the ballot is printed on more than one 	Review of Ballot	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	

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	<p>page, different tints of paper other than yellow, or some other suitable means may be used to facilitate the sorting of ballots.</p> <p>5. Each page shall bear the same ballot number.</p>			
81.52(1)	<p>If the machine returns a ballot to the voter because the ballot is blank, mismarked damaged, or otherwise spoiled, the voter may either attempt to correct the ballots, request another ballot, or request the election official to override the rejection so that the precinct counter accepts the ballot and outstacks the write- in.</p>	L&A Test	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	
81.52, TAC	<p>The precinct counter must be set up to reject and return the ballot to the voter rather than outstack the ballot if it is blank, mismarked, undervoted, or overvoted.</p>	L&A test/General Review	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	
81.52, TAC	<p>If a precinct ballot counter is to be used during early voting by personal appearance, a continuous feed audit log printer must remain attached to the precinct counter throughout the early voting period</p>	General Review	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	
81.62, TAC	<ol style="list-style-type: none"> 1. For any Election Management System's central accumulator to be certified for use in Texas elections, the central accumulator shall include a continuous feed printer dedicated to a real-time audit log. All significant election events and their date and time stamps shall be printed to the audit log. 2. The definition of "significant election events" in subsection (a) of this rule includes but is not limited to: <ol style="list-style-type: none"> a. error and/or warning messages 	Review of Audit Logs	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p>VVSG 2005:</p> <p>2.2.5.2.1.d: "The audit record shall be active whenever the system is in an operating mode. This record shall be available at all times, though it need not be continually visible."</p> <p>2.2.5.2.1.g: "The system shall be capable of printing a copy of the audit record."</p> <p>Also VVSG 2005 Section</p>

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		<p>and operator response to those messages;</p> <p>b. number of ballots read for a given precinct;</p> <p>c. completion of reading ballots for a given precinct;</p> <p>d. identity of the input ports used for modem transfers from precincts;</p> <p>e. users logging in and out from election system; precincts being zeroed;</p> <p>f. reports being generated;</p> <p>g. diagnostics of any type being run; and</p> <p>h. change to printer status.</p>			2.2.5.2.2.a, 4.4 & 6.5.5
Accessibility for Disabled Voters	81.57, TAC	See checklist for details of requirement.	Checklist for Voting System Accessibility for more details.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
	64.009, TEC	If a voter is physically unable to enter the polling place without personal assistance or likelihood of injuring the voter's health, on the voter's request, an election officer shall deliver a ballot to the voter at the polling place entrance or curb. NOTE: "Curbside voting"	General Review	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

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Supplemental Checklist

The following additional items were check. This supplemental checklist provides details on additional items check or adds detail on how specific aspects of the Texas voting system requirements were evaluated.

Vendor: ES&S	Voting System: EVM 5.2.4.0	
General Requirements		
• Is Form 100 complete and satisfactory?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Review Form 100 - Schedule A - Have recommendations/issues made from previous exams been corrected or addressed?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Review Form 101 - Are responses satisfactory?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Review change logs and provide information for testing or questioning vendor	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Training manuals appear complete?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Training manuals appear to be easy to use?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Check with other jurisdictions where system is in use and ask questions regarding system, support and training.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Did the system receive favorable reviews?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Do all configurations listed in application seem feasible? Keep this in mind during the examination to make sure components necessary to ensure the security are included in all configurations and that the configurations will meet the county's needs (scanner used as central and/or precinct, etc..)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Vendors' proposals shall state a clear, unequivocal commitment that the election management and voter tabulation software user's application password is separate from and in addition to any other operating system password.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Vendor's system shall support automated application password expiration at intervals specified by a central system administrator.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Vendor shall discuss the steps required by the system administrator to implement and maintain automated password expiration. This discussion will include narrative concerning the degree to which the application password expiration capabilities are based on (a) the server or client's operating system, (b) the software application, or (c) both	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• The vendor's proposal shall state the name of any automated incident, issue, or problem tracking system used by the firm in providing support to its election system clients.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Verify Installation		
• Verify/List all hardware	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Verify/List all COTS hardware/software versions	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Is the COTS hardware being demonstrated the same version as what was tested at the VSTL?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

Evaluation Report of the ES&S EVM 5.2.4.0

Vendor: ES&S	Voting System: EVM 5.2.4.0	
• Is the COTS software being demonstrated the same version as what was tested at the VSTL?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Witness or actual install the software and firmware with the SOS CDs received from VSTL.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
System Review		
• Warns of Undervote	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Is it easy to choose the appropriate ballot style?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Is the number of ballot styles available on a unit limited?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Can you cancel the marking of a ballot after starting? Explain how.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Is there a way to properly secure all ports on the system?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Are instructions provided in the documentation for securing the system?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Usable for curbside voting?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• How to setup or modify audio files	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• How to adjust volume	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Test both early voting and election day - all functions opening/closing	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Does system include sip 'n puff for accessibility	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Texas Real-time Audit Log Review		
• Print any attempt to tally or load votes that have already been tallied or counted, identifying the precinct or source of the votes and flagging it as a duplicate	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Print starting the tally software (e.g. from the operating system) or exiting the tally software, or any access to the operating system.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
• Record if a printer is paused, turned off, turned on, disconnected, and when reconnected.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

Evaluation Report of the ES&S EVM 5.2.4.0

Appendix A - EAC Certificate of Certification⁸

	United States Election Assistance Commission	
Certificate of Conformance		
ES&S EVS 5.2.4.0		
<p>The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the 2005 <i>Voluntary Voting System Guidelines (2005 VVSG)</i>. 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 <i>EAC Voting System Testing and Certification Program Manual</i> 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.</p>		
Product Name: <u>EVS</u>		
Model or Version: <u>5.2.4.0</u>		
Name of VSTL: <u>Pro V&V</u>		
EAC Certification Number: <u>ESSEVS5410</u>		
Date Issued: <u>June 5, 2018</u>		
	<p>Executive Director U.S. Election Assistance Commission</p> <p>Scope of Certification Attached</p>	

⁸ The EAC Certification number for this system is ESSEVS5240. There is a typographical error on the EAC Certificate of Conformance. This was confirmed by E-Mail with the EAC.

Evaluation Report of the ES&S EVM 5.2.4.0

Appendix B - Digital Signatures of Software Examined

The installation media was provided by Pro V&V for this exam. Digital signatures were taken of both the composite directories, containing all files and directories, and of the individual files, after they were unpacked. Digital signatures of those directories files were recorded to confirm continuity of the software certified in this exam with that tested by Pro V&V and certified by the EAC.

The composite digital signatures are reported in this report. The digital signatures of the individual files, after unpacking, were retained in the records of this exam.

These signatures can be used to verify that the software used in the future is identical to that examined during this exam.

Signature of Directories

Two compressed folders, one with source code and the second with install files, were provided by Pro V&V. The digital signatures of the compressed folders delivered by Pro V&V for this exam were:

The compressed folder with the source code, containing 64 files and folders, was:

SHA-256 Hash: E9E5F920DE2094E45E615917B52156FBE03242E8C69522AEA5C52BFFC813ECC5

The compressed folder with the install files, containing 83 files and folders, was:

SHA-256 Hash: 434675726C5AF5CB2FC22F2D7249ABB52913AC964D24A270D92D990C4EB4AA87