Report Prepared for the
Texas Secretary of State
Elections Division

Voting System Certification Evaluation Report

Election Systems and Software (ESS)
EVS 5.2.1.0 Voting System

Introduction

The Election Systems and Software (ESS) EVS 5.2.1.0 Voting System was evaluated for certification by the State of Texas on June 8-9, 2016. This report summarizes the findings and observations of the ESS EVS 5.2.1.0 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 NTS Laboratories, formerly Wyle Labs.

The EAC certified the system on December 28, 2015. The certification of this system was to the 2005 version of the Voluntary Voting System Guidelines (VVSG), see Appendix A - EAC Certificate of Certification.

The last ESS system certified in Texas, the Unity 3.4.1.0. This system was EAC certified to the older 2002 version of the VVSG, but some modifications were evaluated to the 2005. There are significant improvements in the 2005 version of the VVSG as compared to the 2002 version. Accordingly, this system was evaluated to the more demanding 2005 requirements in contrast to the prior system certified in Texas, which was certified to the 2002 version.

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

Recommendation

The ESS EVS 5.2.1.0 Voting System is recommended for certification. The system was judged to comply with the voting system requirements of the State of Texas.

This recommendation is being made with the observation that prior versions of the system are being successfully used to run elections, including in Texas. A variety of features introduced in

this version bring improvements to the version of the system currently in use and would be a step forward for the counties that currently use the previous system. In particular, moving from the older Unity system to ESS' new EVS system appears to bring significant benefit.

Further, the ESS EVS 5.2.1.0 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 1. 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 1 – EAC list of jurisdictions using closely related versions of the EVS 5.2.1.0 system[1]

County	State	EAC Certified	
		Voting System	System Components
Pima	AZ	ES&S EVS 5.0.0.0	
Pinal	AZ	ES&S EVS 5.0.0.0	
Canyon	ID	ES&S EVS 5.0.0.0	
Hinds	MS	ES&S EVS 5.0.0.0	
Cuyahoga	OH	ES&S EVS 5.0.0.0	
Saint Croix	VI	ES&S EVS 5.0.0.0	
Harrison	WV	ES&S EVS 5.0.0.0	
Lewis	WV	ES&S EVS 5.0.0.0	
Cassia	ID	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	
Fairfax	VA		Components of ES&S EVS 5.2.0.0 Mod

In addition to those jurisdictions use the system or a closely related version, the ES&S EVS 5.2.1.0 has been certified in a number of other states, Table 2. 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.

[1] The EAC maintains a list of jurisdictions using EAC certified systems. This data was accessed on July 10, 2016 and is the source of the data in this table. The URL for the complete list is:

http://www.eac.gov/assets/1/Documents/U.S.%20Election%20Assistance%20Commission.pdf

Table 2 – States that have certified the EVS 5.2.1.0 system or closely related versions of it[2]

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)
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

[2] Information in this table was provided by Steve Pearson of ESS in an E-Mail.

State	Voting System Version Certified
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

Observations and comments are presented in this report. Some suggest areas which might be considered for improvement. These suggestions are made consistent with the recommendation for certification.

Observations and Recommendations

The following are observations of and recommendations for the system.

Documentation of Audit Logs

As observed with its predecessor, the process for gathering the full set of log files was found to be complex and unclear. Further the messages vary across the system components with cryptic or sometimes absent explanation of the meaning of the message or the action that should be taken. For a large percentage the only action recommended is to call the company's service representative. It is recommended that ESS be asked to provide a clear process for gathering a full set of system log files and clear explanations for understanding them. For errors and abnormal events both the meaning of the message and the correct action to be taken should be clear.

A further problem is that in contrast to the treatment of the iVotronic DRE in Unity 3.0.1.1 the Unity 5.2.1.0 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.

The system logs continue to change and become more complex. As seen in Table 3, 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 5.2.1.0 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.". Presumably those would be event and not error message, but there may be some others as well. In the EVS 5.2.1.0

the corrective action for 154 of the errors is given as: “Contact ES&S technical support.”. Thus for a surprisingly high 41.6% of errors the only corrective action suggested is to contact technical support.

Table 3 – DS200 System Log Messages

DS200 Event Log Messages					
ESS Unity3.0.1.1 Amd A	**ESS Unity3.2.0.0 Rev. 1**	**ESS Unity 3.2.0.0 Rev. 2**	**ESS Unity 3.4.0.0**	**ESS Unity 3.4.1.0**	**ESS EVS 5.2.1.0**
155	**155**	**125**	**257**	**276**	**486**

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.

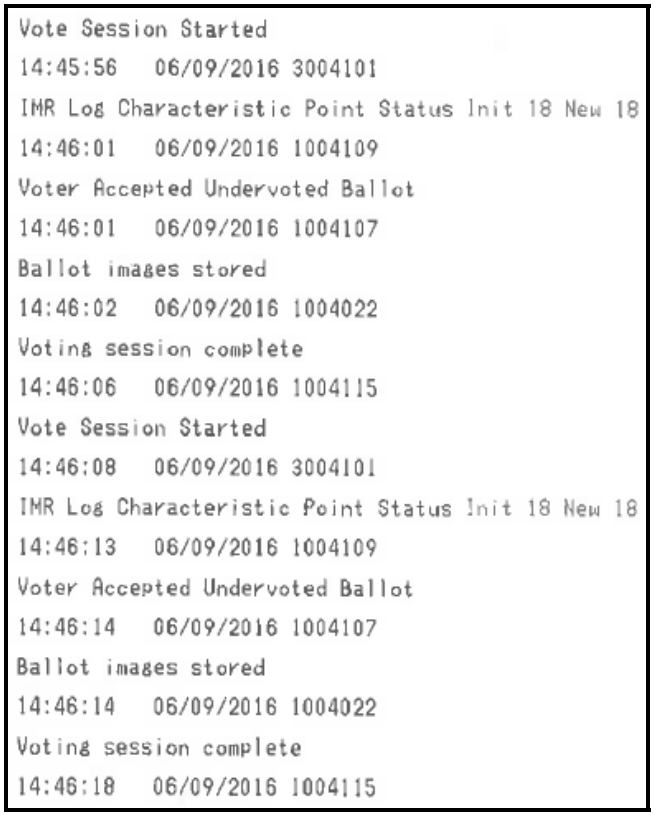


Figure 1 – Sample from a DS200 event log

```
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 2 – Sample from a DS850 event log

```
  DATE       TIME     SYSTEM ACTION OR ERROR INFORMATION                    COUNTED INFORMATION

2016-06-08  11:46:59  DATABASE CREATED (06-08-16)
2016-06-08  11:46:59  ENTERED ELECTION IN ELECTION REPORTING MANAGER (06-08-16)
2016-06-08  12:42:44  Import & process Key Memory Device files failed - Media is NOT for collection preparation
2016-06-08  12:43:20  Import & process Key Memory Device files failed - Media is NOT for collection preparation
2016-06-08  12:43:30  Import & process Key Memory Device files failed - Media is NOT for collection preparation
2016-06-08  12:43:44  Imported & processed Key Memory Device files
2016-06-08  12:44:34  Election Day GROUP 01 SELECTED FOR UPDATE
                      EQUIPMENT TYPE DS2 - UPDATE PRECINCTS COUNTED:N

2016-06-08  12:44:38  START PACK READING (06-08-16) - Read media and update results only
2016-06-08  12:44:42  [AA04012700010774] Process memory device successful (06-08-16)
2016-06-08  12:44:42                                          PRC 0001 (EV) PACK RECEIVED DS2  (BALS=27  TOT=27)
2016-06-08  12:44:42  [AA04012700010774] Process memory device successful (06-08-16)
2016-06-08  12:44:42                                          PRC 0002 (EV) PACK RECEIVED DS2  (BALS=16  TOT=16)
2016-06-08  12:44:42  [AA04012700010774] Process memory device successful (06-08-16)
2016-06-08  12:44:42                                          PRC 0003 (EV) PACK RECEIVED DS2  (BALS=11  TOT=11)
2016-06-08  12:44:44  STOP PACK READING (06-08-16)
2016-06-08  12:44:55  LOG LISTING - ENTIRE LOG WAS PRINTED TO EL68A.LST
```

Figure 3 – Sample from an EVS 5.2.1.0 system log

Figure 1 is an image of a section of a DS200 log. Figure 2 is an image of a section of a DS850 log. Figure 3 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 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

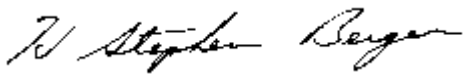
adds further to the number and variation in the logs. How clear and usable these logs are to the typical election official is a significant question.

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.

Mark recognition thresholds

The ballot mark acceptance and rejection thresholds of the scanners in the system is not documented. Further those thresholds are determined by the vendor and they are different for each scanner. The mark acceptance and rejection thresholds should be clearly known by election officials. Further testing of marks near those thresholds should be performed to verify the consistency of each scanner to recognize ballot marks that irregular in some way. This information is important if election officials are to accurately count irregular marks in a close election or recount.

Sincerely,



H. Stephen Berger

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Candidate System

This section describes the candidate system, the ESS EVS 5.2.1.0 Voting System.

System Components

The system is comprised of the components listed in **Error! Reference source not found.** and shown functionally in Figure 4.[3] The previous ESS system certified in Texas is shown in Figure 5.

Notable differences 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. ExpressVote a universal touch-screen ballot marking devices is also introduced with this system.

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

Table 4 - ESS Unity 5.2.1.0 System Components

System Components			
#	Unit/Application	Version	Function
Election Management Software			
1	ElectionWare	4.7.1.0	Election Management Software (EMS) suite, providing end-to-end election management support.
2	Event Log Service	1.5.5.0	A background function that monitors the proper functioning of the Windows Event Viewer.
3	Removable Media Service	1.4.5.0	Supports installation and removal of election and results media.
4	Election Reporting Manager (ERM)	8.12.1.0	Results consolidation and reporting software.
5	VAT Previewer	1.8.6.0	Allows user to preview screen layout and audio for the Automark.
6	ExpressVote Previewer	1.4.1.0	Allows user to preview screen layout and audio for the ExpressVote.
Universal Voting System			
7	ExpressVote	1.4.1.0	Universal touch-screen vote capture device, with independent voter-verifiable paper record that is digitally scanned for tabulation.
Voter Assist Terminal			
8	AutoMARK	1.8.6.0	Accessible ballot marking system that supports audio ballot playback and ballot marking for voters with low vision or with physical disabilities.
Ballot Scanners			
9	DS200	1.12.1.0	Precinct ballot tabulator used to process ballots at a polling place.
14	DS850	2.10.1.0	Central ballot scanner for high-volume tabulation of mail ballots, absentee ballots or Election Day ballots.

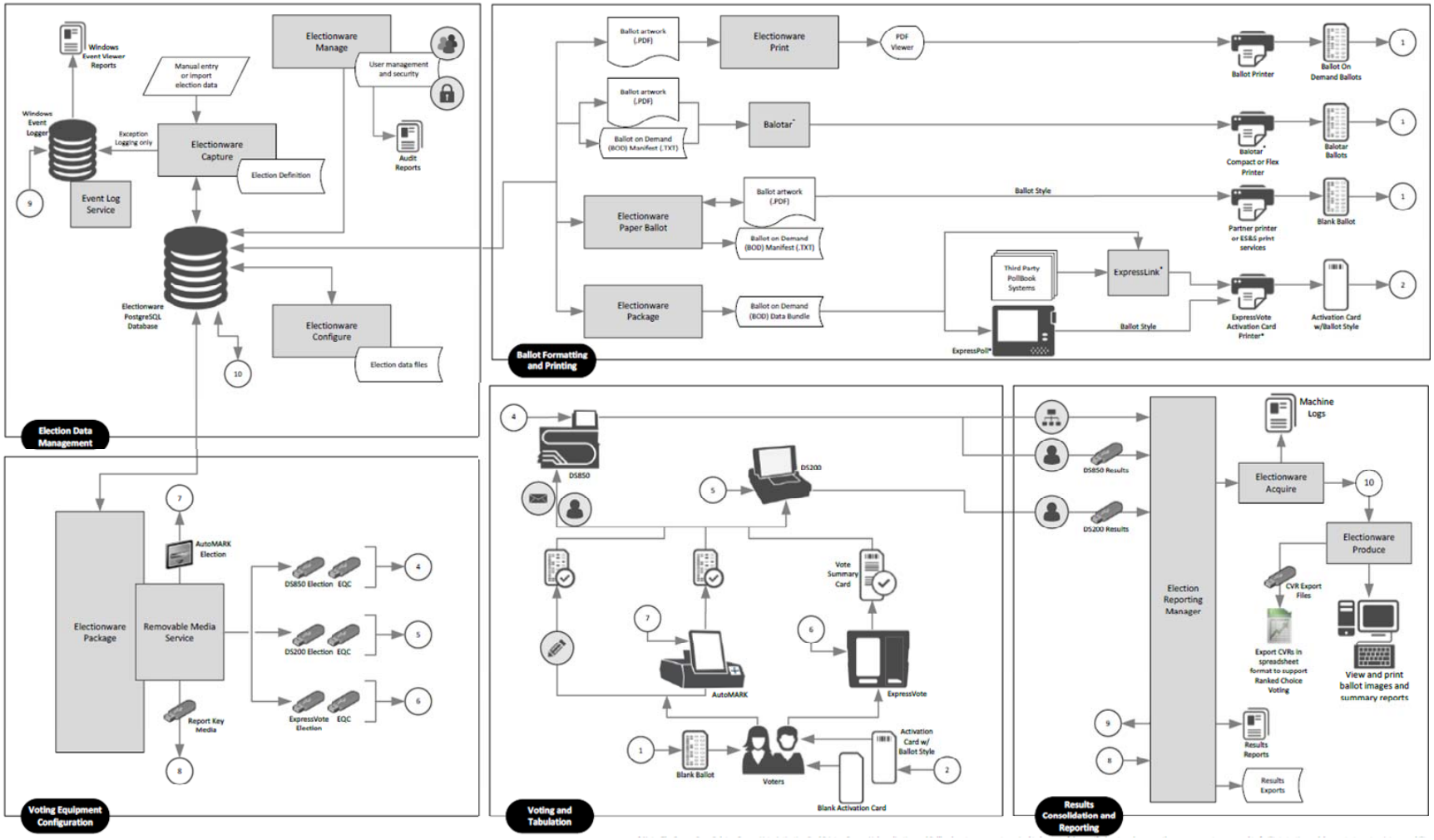

Figure 4 - ESS Unity 5.2.1.0 Process Flow

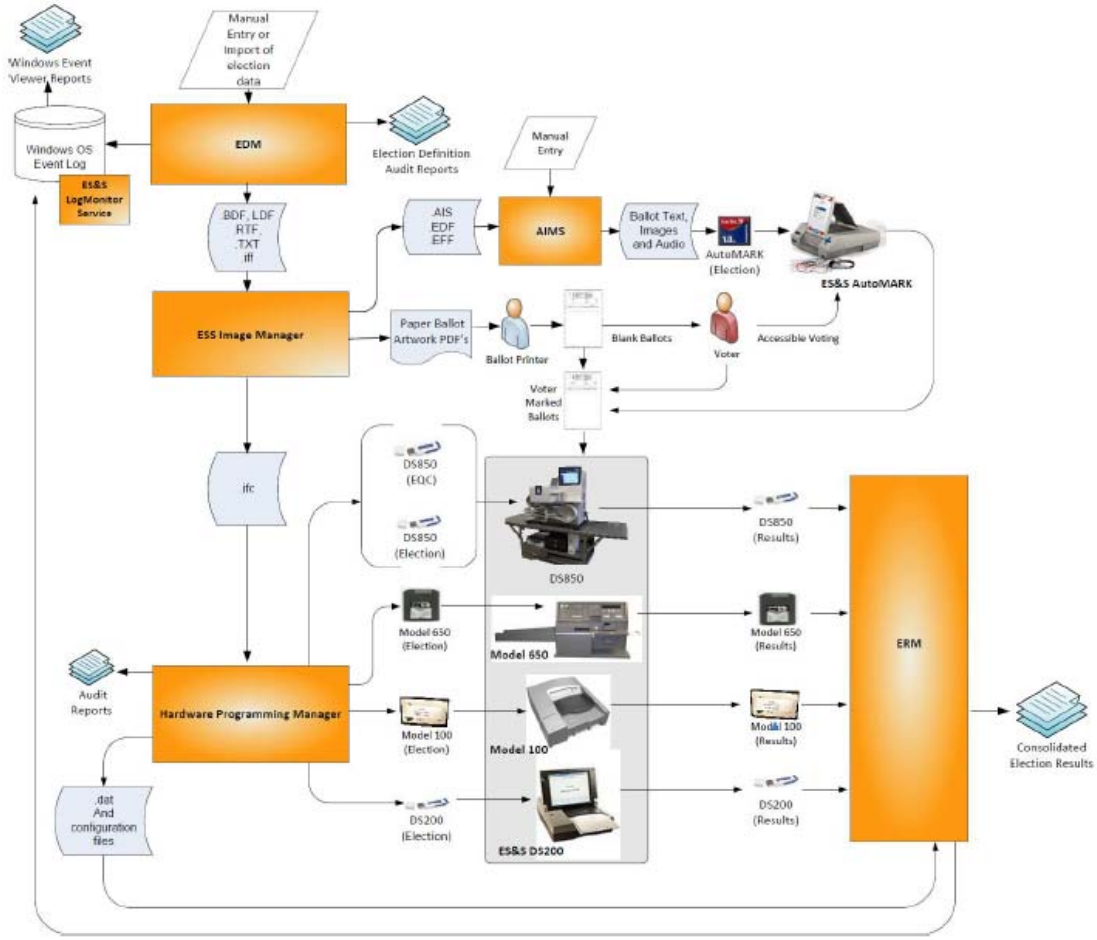

Figure 5 - ESS Unity 3.4.1.0 Process Flow

Components Not Previously Certified

The following components have not previously been certified in Texas:

System Components			
#	**Unit/Application**	**Version**	**Function**
1	**ElectionWare**	**4.7.1.0**	
2	**Event Log Service**	**1.5.5.0**	
3	**ExpressVote**	**1.4.1.0**	
4	**ExpressVote Previewer**	**1.4.1.0**	
5	**Removable Media Service**	**1.4.5.0**	

Comparison to Prior and Successor Systems

The prior ESS voting system certified in Texas was the Unity 3.4.1.0, certified on September 2, 2014. ES&S has two separate branches of the voting systems they offer, the Unity and EVS systems. Many components and changes are made in common. What is done for one branch is also done for the other branch. However, often separate firmware/software version numbers are assigned to make up a release. Unity 3.4.1.0 is considered functionally equivalent to EVS 5.2.0.0 from a DS200, DS850, and AutoMARK firmware standpoint.

Comparison to Previous Version				
#	Unit/Application	3.0.1.1 Version	3.4.1.0 Version	5.2.1.0 Version
1	Unity	3.0.1.1	3.4.1.0	
2	EVS			5.2.1.0
Election Management Software				
3	ElectionWare			4.7.1.0
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
6	ESS 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	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
11	Event Log Service			1.5.5.0
12	ExpressVote			1.4.1.0
13	ExpressVote Previewer			1.4.1.0
14	Removable Media Service			1.4.5.0
AutoMark				
15	AutoMARK	1.1.2258	1.3.2907	1.8.6.0
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
20	DS850		2.9.0.0	2.10.1.0

ESS has received EAC national certification for several preceding and successor systems, Table 5.

Table 5 – 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
Voting Systems Being Examined		
6	EVS 5.2.1.0	December 18, 2015
Successor Voting Systems		
#	System	Date of EAC Application
7	EVS 5.2.1.1	May 4, 2016
8	EVS 5.4.0.0	February 23, 2015

Important insights for the evaluation of the ESS Unity 5.2.1.0 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 from the Unity 3.0.1.1 version to the EVS 5.2.1.0 version.

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

Another noteworthy difference is that the ballot used in Unity is limited to a 3-column vs. ElectionWare's 24-column ballot. Underlying this difference is a significant change in the scanning technology used.

System Limits

System Limitation

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

Table 6 – ESS Unity 3.4.1.0 & EVS 5.2.1.0 System Limits[4]

System Limits				
#	System Variable	System Limit		Limiting Component
		Unity 3.4.1.0	EVS 5.2.1.0	
1	Precincts in an election	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	ERM
3	Candidates per election (max. counters)	21,000[5]	21,000[5]	ERM
4	Contests per election (max. counters)	21,000[6]	21,000[6]	ERM
5	Maximum counters per precinct	1,000	1,000	ERM
6	Contests allowed per ballot style	200	200	N/A
7	Candidates (ballot choices) per contest	175	175	ERM
8	Parties in a General Election	75	75	ERM
9	Parties in a Primary Election	20	20	ERM
10	Choices in a Contest	98	98	ERM
11	Ballot Formats	All paper ballots must be the same size and contain the number of response rows.	All paper ballots must be the same size and contain the number of response rows.	Scanner
12	Ballot styles	9,900	9,900	ERM
13	District types/groups	20	20	ERM
14	Districts of a given type	40[7]	40[7]	ERM

[4] EAC Scope of Certification for the ESS EVS 5.2.1.0 Voting System.
[5] 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 (counter limit – statistics x 2)/number of counters/contest = number of contests.
[6] Contest counters are calculated as indicated in footnote 5, 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."
[7] Excludes the Precinct Group which contains all precincts.

System Limits				
#	System Variable	System Limit		Limiting Component
		Unity 3.4.1.0	EVS 5.2.1.0	
15	Languages supported	• English • Spanish • Chinese • Korean • Bengali	• English • Spanish • Chinese • Korean • 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 .

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.

Examination Report

Description of the Examination

The examination occurred on June 8-9, 2016. 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.

On the first day of the examination, the technical examiners (Stephen Berger, Tom Watson and James Sneeringer), Christina Adkins and some members of the election division staff were present to observe and verify the installation of the vendor's software. SHA-1 digital signatures were recorded of the software provided by NTS 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.

A Secretary of State Staff Attorney tested the the AUTOMARK Voter Assist Terminal ("AutoMARK") for compliance with state and federal accessibility guidelines.

On the second day ESS staff reviewed the Unity 5.2.1.0, 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 Unity 3.4.1.0.

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 (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 is 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

DRE Support

Because the system does not include the iVotronic, ESS's DRE, the vendor was asked how jurisdictions that use the iVotronic could continue to use them with the new system. Their response was that they could continue to use them with Unity 3.0.1.1 and merge the results of that system with the 5.2.1.0, which would be required if that jurisdiction had acquired the DS200, DS850 or updated other components to the 5.2.1.0 level. However, ES&S did not bring a Unity 3.0.1.1 system to demonstrate how the merger of the two systems would take place. Therefore, the merge functionality has not been evaluated.

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 ☒ No ☐	
	122.001(a)(2)	Must be suitable for the purpose for which it is intended	General Review	Yes ☒ No ☐	
	122.001(a)(3)	Operates safely, efficiently, and accurately and complies with the voting system standards adopted by the EAC.	EAC Certification #	Yes ☒ No ☐	EAC Certification Number: ESSEVS5210
	122.001(a)(4)	Is safe from fraudulent or unauthorized manipulation	General Review	Yes ☒ No ☐	
	122.001(a)(5)	Permits voting on all offices and measures to be voted on at the election.	L&A test	Yes ☒ No ☐	
	122.001(a)(6)	Prevents counting votes on offices and measures on which the voter is not entitled to vote	L&A Test	Yes ☒ No ☐	
	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 ☒ No ☐	
	122.001(a)(8)	Prevents counting a vote on the same office or measure more than once	L&A Test	Yes ☒ No ☐	
	122.001(a)(9)	Permits write-in voting	L&A Test	Yes ☒ No ☐	
	122.001(a)(10)	Is capable of permitting straight-party voting	L&A Test	Yes No	

Category	Source of Law	Requirement	Assessment Method	Compliant	Notes
		(See also, Straight Party Voting in checklist)		☒ ☐	
	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 ☒ No ☐	
	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 ☒ No ☐	
	122.033(1)	Must be equipped with a security system capable of preventing operation of the machine	General Review	Yes ☒ No ☐	
	122.033(2)	Must be equipped with registering counter that can be secured against access	General Review	Yes ☒ No ☐	
	122.033(3)	Must be equipped with a public counter	General Review	Yes ☒ No ☐	
	122.033(4)	Voting system must be equipped with a protective counter.	General Review	Yes ☒ No ☐	
	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 ☒ No ☐	
	122.001(d)(2)	Must not use a punch-card ballot or similar form of tabulating	General Review	Yes ☒ No ☐	
	122.001(d)1)	Must not be a mechanical voting machine	General Review	Yes ☒ No ☐	

Category	Source of Law	Requirement	Assessment Method	Compliant	Notes
	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 ☒ No ☐	
	127.1231	No modem access to the tabulating equipment is available during the tabulation	General Review	Yes ☒ No ☐	
	129.054	A voting system may not be connected to any external communications network, including the internet.	General Review	Yes ☒ No ☐	
		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 eternal infrared transmission and the system can only accept transmissions generated by the system.	General Review	Yes ☒ No ☐	
	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 ca 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 ☒ No ☐	
	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 ☒ No ☐	

Category	Source of Law	Requirement	Assessment Method	Compliant	Notes
	272.005	Ballots must be printed with all ballot instructions, office titles, column headings, proposition heading, and propositions appearing in English and Spanish.	Review Ballot	Yes ☒ No ☐	
	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 ☒ No ☐	
	11.054, Education Code	Must allow for cumulative voting.	General Review	Yes ☒ No ☐	
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 ☒ No ☐	
	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 ☒ No ☐	
	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 ☒ No ☐	
Ballot Requirements	43.007	DRE's only authorized for CWPP --- must have the capability of more than 1 ballot style.		Yes ☒ No ☐	
	124.001	In an election in which voters are entitled to case straight-party votes, the voting system ballot shall be arranged to permit the voters to do so.	Review of Ballot	Yes ☒ No ☐	

Category	Source of Law	Requirement	Assessment Method	Compliant	Notes
	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 (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.	Review of Ballot	Yes ☒ No ☐	
	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 ☒ No ☐	
	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 ☒ No ☐	
	124.063	Certain Instructions Required on Electronic Voting System Ballot -- "Vote for the candidates of your choice in	Review of Ballot	Yes ☒ No ☐	

Category	Source of Law	Requirement	Assessment Method	Compliant	Notes
		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" (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 ☒ No ☐	
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 ☒ No ☐	
	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	Review Provisional Ballot	Yes ☒ No ☐	

Category	Source of Law	Requirement	Assessment Method	Compliant	Notes
		a voter who executed an affidavit in accordance with Section 63.011 of the Code. **(NOTE: Need to show SOS how provisional ballot works**)			
	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 from regularly-cast votes on the precinct returns; and (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.	Review Provisional Ballot	Yes ☒ No ☐	
	127.063	Sealed ballot box must be: 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. NOTE: for Ballots to be counted at CCS.	Review of Equipment	Yes ☒ No ☐	
Optical scan Systems	81.43, TAC	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	Review of Ballot	Yes ☒ No ☐	

Category	Source of Law	Requirement	Assessment Method	Compliant	Notes
		must be printed oat 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 page, different tints of paper other than yellow, or some other suitable means may be used to facilitate the sorting of ballots. 5. Each page shall bear the same ballot number.			
	81.52(1)	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.	L&A Test	Yes ☒ No ☐	
	81.52, TAC	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.	L&A test/General Review	Yes ☒ No ☐	
	81.52, TAC	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	General Review	Yes ☒ No ☐	

Category	Source of Law	Requirement	Assessment Method	Compliant	Notes
		throughout the early voting period			
	81.62, TAC	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: a. error and/or warning messages and operator response to those messages; b. number of ballots read for a given precinct; c. completion of reading ballots for a given precinct; d. identity of the input ports used for modem transfers from precincts; e. users logging in and out from election system; precincts being zeroed; f. reports being generated; g. diagnostics of any type being run; and h. change to printer status.	Review of Audit Logs	Yes ☒ No ☐	VVSG 2005: 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." 2.2.5.2.1.g: "The system shall be capable of printing a copy of the audit record." Also VVSG 2005 Section 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 ☒ No ☐	

Category	Source of Law	Requirement	Assessment Method	Compliant	Notes
	64.009, TEC	If a voter is physically unable to enter the polling place without personal assistance or likelihood if 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 ☒ No ☐	

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: ESS	**Voting System: EVM 5.2.1.0**	
General Requirements		
• Is Form 100 complete and satisfactory?	Yes ☒	No ☐
• Review Form 100 - Schedule A - Have recommendations/issues made from previous exams been corrected or addressed?	Yes ☒	No ☐
• Review Form 101 - Are responses satisfactory?	Yes ☒	No ☐
• Review change logs and provide information for testing or questioning vendor	Yes ☒	No ☐
• Training manuals appear complete?	Yes ☒	No ☐
• Training manuals appear to be easy to use?	Yes ☒	No ☐
• Check with other jurisdictions where system is in use and ask questions regarding system, support and training.	Yes ☒	No ☐
• Did the system receive favorable reviews?	Yes ☒	No ☐
• 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 ☒	No ☐
• 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 ☒	No ☐
• Vendor's system shall support automated application password expiration at intervals specified by a central system administrator.	Yes ☒	No ☐
• 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 ☒	No ☐
• 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 ☒	No ☐
Verify Installation		
• Verify/List all hardware	Yes ☒	No ☐
• Verify/List all COTS hardware/software versions	Yes ☒	No ☐
• Is the COTS hardware being demonstrated the same version as what was tested at the VSTL?	Yes ☒	No ☐

Vendor: ESS	Voting System: EVM 5.2.1.0	
• Is the COTS software being demonstrated the same version as what was tested at the VSTL?	Yes ☒	No ☐
• Witness or actual install the software and firmware with the SOS CDs received from VSTL.	Yes ☒	No ☐
System Review		
• Warns of Undervote	Yes ☒	No ☐
• Is it easy to choose the appropriate ballot style?	Yes ☒	No ☐
• Is the number of ballot styles available on a unit limited?	Yes ☒	No ☐
• Can you cancel the marking of a ballot after starting? Explain how.	Yes ☒	No ☐
• Is there a way to properly secure all ports on the system?	Yes ☒	No ☐
• Are instructions provided in the documentation for securing the system?	Yes ☒	No ☐
• Usable for curbside voting?	Yes ☒	No ☐
• How to setup or modify audio files	Yes ☒	No ☐
• How to adjust volume	Yes ☒	No ☐
• Test both early voting and election day - all functions opening/closing	Yes ☒	No ☐
• Does system include sip 'n puff for accessibility	Yes ☒	No ☐
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 ☒	No ☐
• Print starting the tally software (e.g. from the operating system) or exiting the tally software, or any access to the operating system.	Yes ☒	No ☐
• Record if a printer is paused, turned off, turned on, disconnected, and when reconnected.	Yes ☒	No ☐

Appendix A - EAC Certificate of Certification

United States Election Assistance Commission

Certificate of Conformance

ES&S EVS 5.2.1.0

VVSG 2005 VER. I

EAC CERTIFIED

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: 5.2.1.0

Name of VSTL: NTS Laboratories

EAC Certification Number: ESSEVS5210

Date Issued: December 18, 2015

Executive Director
U.S. Election Assistance Commission

Scope of Certification Attached

Appendix B - Digital Signatures of Software Examined

SHA-1 and SHA-256 digital signatures of those files were recorded to confirm continuity of the software certified in this exam with that tested by NTS and certified by the EAC. These signatures can be used to verify that the software used in the future is identical to that examined during this exam.

ESS's recommended system verification procedures are contained in the following documents:

- ES&S Voting System 5.2.1.0 Quick Hash Procedure, EMS Document - Revision 1.0
  Files Name: EVS5210_CM_D_2010_EMSQuickHashProcedure.pdf
- ES&S Voting System 5.2.1.0 Quick Hash Procedure, AutoMARK - Revision 1.0
  Files Name: EVS5210_CM_D_2021_AutoMARKQuickHashProcedure.pdf
- ES&S Voting System 5.2.1.0 Quick Hash Procedure, DS850 - Revision 1.0
  Files Name: EVS5210_CM_D_2050_DS850QuickHashProcedure.pdf
- ES&S Voting System 5.2.1.0 Quick Hash Procedure, DS200 - Revision 1.0
  Files Name: EVS5210_CM_D_2070_DS200QuickHashProcedure.pdf
- ES&S Voting System 5.2.1.0 Quick Hash Procedure, ExpressVote - Revision 1.0
  Files Name: EVS5210_CM_D_2081_ExpressVoteQuickHashProcedure.pdf

The process requires making a copy of the software to a USB drive and physically extracting the CF card, see Figure 6 and Figure 7. A comparison is then to be made to a trusted version of the software. The trusted version must be obtained by the person performing the verification. The instructions do not list the expected values nor are they provided in a file supporting the batch file provided for verifying the software and firmware.

While the process can be performed it is time consuming, complex and required partially disassembling some units. 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.

Figure 6 - Location of CF card in DS850[8]

[8] • ES&S Voting System 5.2.1.0 Quick Hash Procedure, DS850 - Revision 1.0, pg. 20.

Figure 7 - Location of CF card in DS200[9]

[9] ES&S Voting System 5.2.1.0 Quick Hash Procedure, DS200 - Revision 1.0, pg. 21.

The software provided by NTS contained the following files:

```
+---EAC
|  +---ConsolidatedInstalls
|  |  \---EVS 5.2.1.0
|  |     +---ProductInstalls
|  |     |  +---CustomerInstalls
|  |     |  |  +---ElectionWare 4.7.1.0
|  |     |  |  |      ElectionWareInstaller.exe
|  |     |  |  |
|  |     |  |  +---ERM 8.12.1.0
|  |     |  |  |      Setup.exe
|  |     |  |  |
|  |     |  |  +---EventLog 1.5.5.0
|  |     |  |  |
|  |     |  |  |  EventLog Setup.exe
|  |     |  |  +---ExpressVotePreviewer 1.4.1.0
|  |     |  |  |
|  |     |  |  |  ExpressVotePreviewerInstaller.exe
|  |     |  |  +---Hardware
|  |     |  |  |  +---AutoMARK 1.8.6.0
|  |     |  |  |  |   \---firmware
|  |     |  |  |  |          AutoMARK.THUMB.CAB
|  |     |  |  |  |          automark.thumb.lst
```

```
| |     | | | |         VALID.CDE
| |     | | | |
| |     | | |  +---Ds200(i) 2.12.1.0
| |     | | | |      update.img
| |     | | | |
| |     | | |\---ExpressVote 1.4.1.0
| |     | |||          update.img
| |     |||  |
| |     | |  +---Removable Media Service 1.4.5.0
| |     | | |      RMU Setup.exe
| |     |||  |
| |     | |  \---VAT Preview 1.8.6.0
| |     | |     \---disk1Preview
| |     | |
| |     | |
| |     | |Autorun.inf
| |     | |data1.cab
| |     | |data1.hdr
| |     | |data2.cab
| |     | |engine32.cab
| |     | |layout.bin
| |     | |setup.exe
| |     | |setup.ibt
            setup.ini
            setup.inx
```

```
| |     | |
| |     | \---ManufacturingInstalls
| |     |     +---Ds200(i) 2.12.1.0
| |     |     |       prod_release.img
| |     |     |
| |     |     +---DS850(i) 2.10.1.0
| |     |     |       prod_release.img
| |     |     |
| |     |     +---ExpressVote
| |     |     |   +---DetachableKeyBoard 1.0.0.0
| |     |     |   |       detachableKeyboard.S19
| |     |       |
| |     ||    |   +---ExpressVote 1.4.1.0
| |     |     |   |       prod_release.img
| |     |       |
| |     ||    |   +---InputOutputBoard 1.1.0.0
| |     |     |   |       InputOutputBoard.S19
| |     |       |
| |     ||    |   \---ScannerPrinterEngine 1.4.1.0
| |     |     |           ScannerPrinterEngine.S19
| |     |     |
| |     |     \---VAT
| |     |         +---AutoMARK 1.8.6.0
```

```
| |   |       |\---firmware
| |   |       |        AutoMARKProduction.THUMB.CAB
| |   |       |
| |   |       |
|       AutoMARKService.THUMB.CAB
| |   |       +---PrinterEngineBoard 1.70
| |   |            PEB.hex
|       |
| |   |       |
| |   |       +---SwitchInterfaceBoard 1.43
| |   |            SIB.hex
|       |
| |   |       |
| |   |       \---UltrasonicSheetDetector 8.0.1
| |   |
| |   |
|     ultra.s19
| |   \---ProductUtilities
| |       +---COTS
| |       |   \---RMCOBOL12RP
| |       |        rmcobol1206rp.exe
| |       |
| |       +---HardeningScripts
| |       |   \---EMS
| |       |        CreateNewUsers.EXE
| |       |        NoNetwork.EXE
| |       |        PostInstall.EXE
```

```
|  |        |        PreInstall.EXE
|  |        |        ServerShare.EXE
|  |        |
|  |        \---ValidationScripts
|  |            +---AutoMARKHashTools
|  |            |  +---AutoMARKHashScripts
|  |            |  |      AutoMARKValidate.bat
|  |            |  |
|  |            |  +---Bootloader 2.0
|  |            |  |      adsload.rom
|  |            |  |      Bootloader 2.0.zip
|  |            |  |
|  |            |  +---Bootloader 2.5
|  |            |  |      adsload.rom
|  |            |  |      Bootloader 2.5.zip
|  |            |  |
|  |            |  +---SimpleElection
|  |            |  |  |   ReadmeElectionInfo.txt
|  |            |  |  |
|  |            |  |  \---ElectionData
|  |            |  |      |   Audio.txt.eeff
|  |            |  |      |   auth_am.bin
|  |            |  |      |   BallotLangs.txt.eeff
```

| | | | | BallotOvals.txt.eeff
| | | | | BallotRaceCandidates.txt.eeff
| | | | | BallotRaces.txt.eeff
| | | | | Ballots.xml.eeff
| | | | | Ballots.xsd.eeff
| | | | | CandGroups.txt.eeff
| | | | | CandidateLabels.txt.eeff
| | | | | Candidates.txt.eeff
| | | | | Election.txt.eeff
| | | | | Groups.txt.eeff
| | | | | HeaderLabels.txt.eeff
| | | | | Languages.xml.eeff
| | | | | Languages.xsd.eeff
| | | | | Manifest.mf.eeff
| | | | | Manifest.mf.eeff.asc
| | | | | PrecinctBallots.txt.eeff
| | | | | Precincts.txt.eeff
| | | | | PromptTranslations.xml.eeff
| | | | | PromptTranslations.xsd.eeff
| | | | | RaceLabels.txt.eeff
| | | | | Races.txt.eeff
| | | | | Readme.txt
| | | | | SplitBallotLabels.txt.eeff

```
| |       | |   | Translations.xml.eeff
| |       | |   | Translations.xsd.eeff
| |       |     |
| |       | |   +---Audio
| |       | |   |       Cantonese Chinese.WAV
| |       | |   |
| |       | |   | Chinese.WAV
| |       | |   |       Creole.WAV
| |       | |   |       English.WAV
| |       | |   |       Japanese.WAV
| |       | |   |
| |       | |   | Korean.WAV
| |       | |   | Russian.WAV
| |       | |   | Spanish.WAV
| |       | |   | Tagalog.WAV
| |       | |   |       Vietnamese.WAV
| |       |     |
| |       | |
| |       | | \---Images
| |       |     |       AutoMark_default_transparent_header_graphic.bmp
| |       |     |
| |       | |   |       \---Lang1
| |       | |   |               uibuttonhc_back-hit.jpg
| |       | |   |               uibuttonhc_back-hit_zoom.jpg
| |       | |   |               uibuttonhc_back.jpg
| |       | |   |               uibuttonhc_back_zoom.jpg
```

| | | | | uibuttonhc_exit-hit.jpg
| | | | | uibuttonhc_exit-hit_zoom.jpg
| | | | | uibuttonhc_exit.jpg
| | | | | uibuttonhc_exit_zoom.jpg
| | | | | uibuttonhc_hic-hit.jpg
| | | | | uibuttonhc_hic-hit_zoom.jpg
| | | | | uibuttonhc_hic.jpg
| | | | | uibuttonhc_hic_zoom.jpg
| | | | | uibuttonhc_next-hit.jpg
| | | | | uibuttonhc_next-hit_zoom.jpg
| | | | | uibuttonhc_next.jpg
| | | | | uibuttonhc_next_zoom.jpg
| | | | | uibuttonhc_zoom-hit.jpg
| | | | | uibuttonhc_zoom-hit_zoom.jpg
| | | | | uibuttonhc_zoom.jpg
| | | | | uibuttonhc_zoom_minus-hit.jpg
| | | | | uibuttonhc_zoom_minus-hit_zoom.jpg
| | | | | uibuttonhc_zoom_minus.jpg
| | | | | uibuttonhc_zoom_minus_zoom.jpg
| | | | | uibuttonhc_zoom_zoom.jpg
| | | | | uibutton_back-hit.jpg
| | | | | uibutton_back-hit_zoom.jpg
| | | | | uibutton_back-select.jpg

| | | | uibutton_back-select_zoom.jpg
| | | | uibutton_back.jpg
| | | | uibutton_back_zoom.jpg
| | | | uibutton_exit-hit.jpg
| | | | uibutton_exit-hit_zoom.jpg
| | | | uibutton_exit-select.jpg
| | | | uibutton_exit-select_zoom.jpg
| | | | uibutton_exit.jpg
| | | | uibutton_exit_zoom.jpg
| | | | uibutton_hic-hit.jpg
| | | | uibutton_hic-hit_zoom.jpg
| | | | uibutton_hic-select.jpg
| | | | uibutton_hic-select_zoom.jpg
| | | | uibutton_hic.jpg
| | | | uibutton_hic_zoom.jpg
| | | | uibutton_next-hit.jpg
| | | | uibutton_next-hit_zoom.jpg
| | | | uibutton_next-select.jpg
| | | | uibutton_next-select_zoom.jpg
| | | | uibutton_next.jpg
| | | | uibutton_next_zoom.jpg
| | | | uibutton_zoom-hit.jpg
| | | | uibutton_zoom-hit_zoom.jpg

```
| |       | |           uibutton_zoom-select.jpg
| |       | |           uibutton_zoom-select_zoom.jpg
| |       | |           uibutton_zoom.jpg
| |       | |           uibutton_zoom_minus-hit.jpg
| |       | |           uibutton_zoom_minus-hit_zoom.jpg
| |       | |           uibutton_zoom_minus-select.jpg
| |       | |           uibutton_zoom_minus-select_zoom.jpg
| |       | |           uibutton_zoom_minus.jpg
| |       | |           uibutton_zoom_minus_zoom.jpg
| |       | |           uibutton_zoom_zoom.jpg
| |       | |
| |       | \---ValidaterProgram
| |       |         Automark Validater 1.0.0.0 CD Software Install.ZIP
| |       |
| |       +---DS200QuickHashscripts
| |       |     createHashList.sh
| |       |     CreateTrustedHashFilesCard.sh
| |       |     CreateTrustedHashFilesStick.sh
| |       |     CreateVerifyHashFilesCard.sh
| |       |     CreateVerifyHashFilesStick.sh
| |       |     filterDynamic.sh
| |       |     genHash.sh
| |       |     SetupValidateDir.sh
```

```
| |       |   ValidateHash.sh
| |       |
| |       +---DS850QuickHashScripts
| |       |   createHashList.sh
| |       |   CreateTrustedHashFilesCard.sh
| |       |   CreateTrustedHashFilesStick.sh
| |       |   CreateVerifyHashFilesCard.sh
| |       |   CreateVerifyHashFilesStick.sh
| |       |   filterDynamic.sh
| |       |   genHash.sh
| |       |   SetupValidateDir.sh
| |       |   ValidateHash.sh
| |       |
| |       +---EMSQuickHashScripts
| |       | | CreateHashFilesEMS.sh
| |       | | SetupTrustedDir.sh
| |       | | SetupVerifyDir.sh
| |       | | validateHashEMS.sh
| |       | |
| |       | \---StaticDynamicExamples
| |       |       allfiles.csv
| |       |       dynamic.csv
| |       |       static.csv
```

```
| |           |
| |           \---ExpressVoteQuickHashScripts
| |                   ExpressVoteValidate.bat
| |
|  \---SourceOnlyStaging
|     +---AutoMARK 2014-04-14
|     |     PrinterEngineBoard_1.70_Source.zip
|     |     SwitchInterfaceBoard_1.43_Source.zip
|     |     UltrasonicSheetDetector_8.0.1_Source.zip
|     |     VAT_1.8.6.0h_Source.zip
|     |
|     +---DS200 2015-10-29
|     |  \---DS200 - 2.12.1.0e
|     |        source.iso
|     |
|     +---DS200 Ancillary Devices 2014-04-14
|     |     PowerManagementMsp430_1.2.14.0b_Source.zip
|     |     ScannerC8051_3.1.0.0a_Source.zip
|     |
|     +---DS850 2015-10-29
|     |  \---DS850 2.10.1.0c
|     |        source.iso
|     |
```

| +---EMS 2014-04-14
| | CB_Evt_2.6.0.0a_Source.zip
| | CB_XMLConv_2.6.0.0a_Source.zip
| | CB_XML_2.6.0.0a_Source.zip
| | CreateLog_1.5.5.0a_Source.zip
| | ElectionWarePaperBallot_4.6.0.0h_Source.zip
| | electionware_4.6.0.0zl_DataSchemaPkg.zip
| | electionware_4.6.0.0zl_DataSprocsPkg.zip
| | electionware_4.6.0.0zl_SourcePkg.zip
| | ERMXMLConvDLL_3.6.0.0a_Source.zip
| | ERMXMLDATA_2.6.0.0a_Source.zip
| | ERM_8.11.0.0k_Source.zip
| | EssEvtA_1.5.5.0a_Source.zip
| | EssEvtMsg_1.5.5.0a_Source.zip
| | EssEvt_1.5.5.0a_Source.zip
| | EssXml_4.6.0.0a_Source.zip
| | EvtSvc_1.5.5.0a_Source.zip
| | ExitWin_2.6.0.0a_Source.zip
| | libCoNG_1.7.0.0f_Source.zip
| | LogEvent_1.5.5.0a_Source.zip
| | MYDLL_2.6.0.0a_Source.zip
| | RegUtil_2.6.0.0a_Source.zip
| | RmuCli_1.4.5.0a_Source.zip

```
|   |   RmuDll_1.4.5.0a_Source.zip
|   |   RmuSvc_1.4.5.0a_Source.zip
|   |   RSACrypto_3.6.0.0a_Source.zip
|   |   ShellSetup_2.6.0.0a_Source.zip
|   |   Shell_2.6.0.0a_Source.zip
|   |
|   +---EMS 2015-07-10
|   |   electionware_4.6.1.0c_DataSchemaPkg.zip
|   |   electionware_4.6.1.0c_DataSprocsPkg.zip
|   |   electionware_4.6.1.0c_SourcePkg.zip
|   |   ERM_8.11.1.0a_Source.zip
|   |   RSACrypto_3.6.1.1a_Source.zip
|   |
|   +---EMS 2015-11-02
|   |   ElectionWarePaperBallot_4.6.1.0c_Source.zip
|   |   electionware_4.7.1.0n_DataSchemaPkg.zip
|   |   electionware_4.7.1.0n_DataSprocsPkg.zip
|   |   electionware_4.7.1.0n_SourcePkg.zip
|   |   ERMXMLConvDLL_3.6.1.0a_Source.zip
|   |   ERMXMLDATA_2.6.1.0a_Source.zip
|   |   ERM_8.12.1.0f_Source.zip
|   |
|   \---ExpressVote 2015-11-09
```

```
|           DetachableKeyboard_1.0.0.0d_Source.zip
|           ExpressVote_1.4.1.0l_Source.zip
|           InputOutputBoard_1.1.0.0b_Source.zip
|           ScannerPrinterEngine_1.4.1.0d_Source.zip
|
\---VSTL

\---AncillaryInstalls
       +---ConsolidatedInstalls
          \---EVS 5.2.1.0
 |           \---ProductInstalls
|               \---CustomerInstalls
|                   \---ExpressLink 1.3.0.0
|                         ExpressLinkInstaller.exe
|
|
\---SourceOnlyStaging

\---ExpressLink 2015-09-29


ExpressLink_1.3.0.0a_SourcePkg.zip
```