



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



**Voting System Certification  
Evaluation Report**

**ES&S**

**Unity Voting System  
Version 3.0.1.1  
&  
AutoMark  
Version 1.1**

**Introduction**

The ES&S Unity Voting System, Version 3.0.1.1 and the AutoMark, Version 1.1 (the system) were evaluated for certification as a voting system by the State of Texas on January 18-19, 2007.

**Recommendation**

The system was found to comply with the requirements of the State of Texas for voting systems and is therefore recommended for certification in the state of Texas.



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## Candidate System

This examination was convened to qualify the modifications introduced by the upgrade from ES&S Unity Version 2.4.3.1 to 3.0.1.1 and the AutoMark Version 1.0 to 1.1. Previous versions of the system are certified for use in Texas. The ES&S Unity System Version 2.4.3.1 was certified on January 31, 2006. The ES&S Automark Version 1.0 was certified on August 1, 2005. While this examination looks at all aspects of the system particular attention was given to the changes from previously certified systems.

The information on system configuration in this test report is partially derived from and depended upon information contained in the ITA Qualification Test Report for the Unity Version 3.0.1.0, dated March 9, 2006, and the Unity Version 3.0.1.1, dated June 12, 2006.

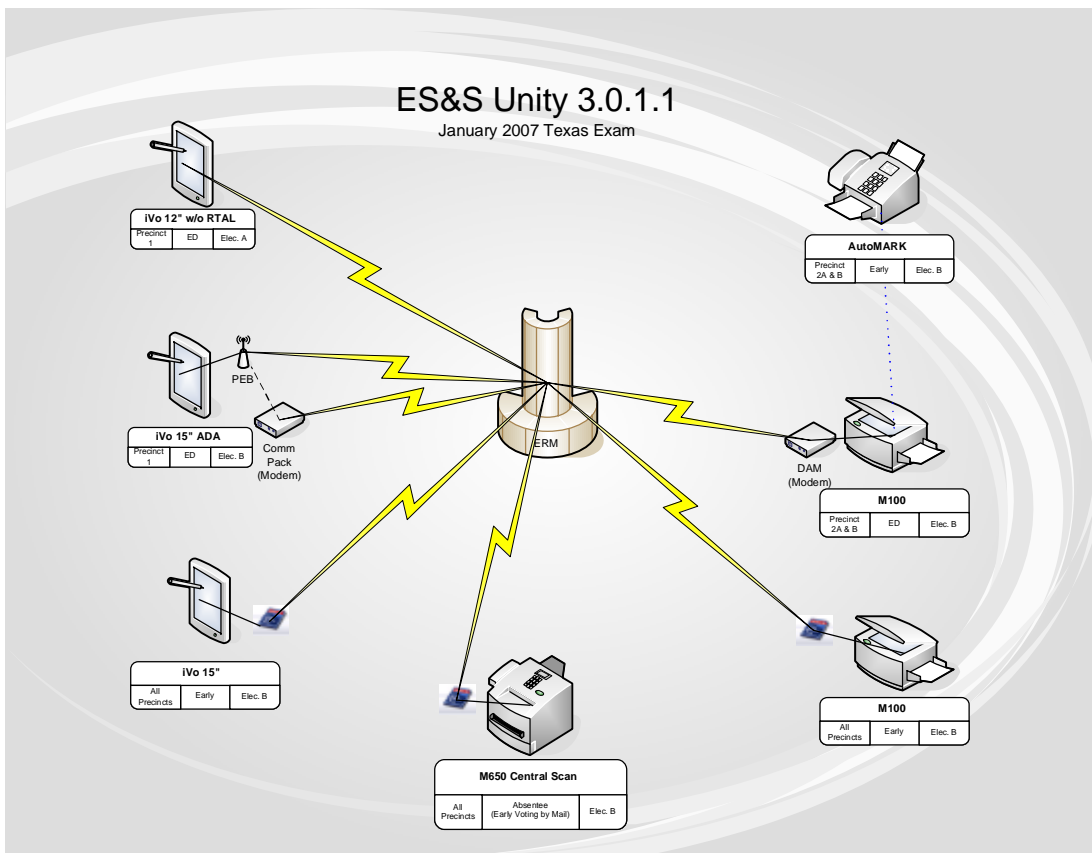


Figure 1 – ESS Unity 3.0.1.1 & AutoMark 1.1 Voting Systems



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## System Configuration

*ES&S 3.0.1.1*

NASED Certification # N-2-02-22-22-007

<b>Software &amp; Firmware</b>		
<b>Application</b>	<b>Manufacturer</b>	<b>Version</b>
Audit Manager	ES&S	7.3.0.0
Election Data Manager	ES&S	7.4.4.0
ES&S Ballot Image Manager	ES&S	7.4.2.0
iVotronic Image Manager	ES&S	2.0.1.0
Optech Image Manager	ES&S	4.0.0.0
Ballot Online	ES&S	1.2.0.0
Hardware Programming Manager	ES&S	5.2.4.0
Data Acquisition Manager	ES&S	6.0.0.0
Election Reporting Manager	ES&S	7.1.2.1
iVotronic Firmware	ES&S	9.1.6.2
Gang Burner (Compact Flash Multi-Card Reader/Wirter)	ES&S	9.1.0.0
M100 Firmware	ES&S	5.2.1.0
M650 Firmware	ES&S	2.1.0.0
<b>AutoMark</b>		
AutoMark Voter Assist Terminal (VAT)	ES&S	1.1.2258
AutoMark Information Management System (AIMS)	ES&S	1.2.18
<b>COTS Applications</b>		
Acrobat	Adobe	7.0 (Standard)
Acrobat Distiller	Adobe	6.0
Adobe Type Manager	Adobe	4.1
Norton Antivirus Protection	Symantec	2005
RM COBOL Runtime System	Liant Software	7.50.01
COBOL WOW	Liant Software	3.12.00



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PC Card Manager / PCM	Magic Ram	1.3(1.60)
Omni Drive USB Professional	CSM	-
Crystal Reports	Business Objects	9.0
Java 2 Runtime Environment, SE	Sun	1.4.2_08
MS Office (Standard Edition)	Microsoft	2003
MYSQL		4.1.10a
PRO Ethernet Adapter and Software	Intel	-
RTAL	Future Logic	Firmware v.11

<b>Hardware</b>			
<b>Application</b>	<b>Manufacturer</b>	<b>O/S Version</b>	<b>Type</b>
<b>Election Management System</b>			
Compact Flash Multi-Card Reader/Writer	ES&S		
PEB Reader	ES&S	91139 iV 1.1	Media Reader/Writer
<b>COTS Components of Election Management System</b>			
Dell Optiplex Laptop gx260	Dell	Windows XP, SP2	Laptop Computer
SanDisc	CSM		
Omni Drive			
EMP11			
External ZIP drive (250)	Iomega		
Dell Desktop	Dell	Windows XP SP2	Personal Computer
LaserJet Printer 4050N	HP		
SanDisc	CSM		
Memory Pack Reader			
Ballot Printer	OKI	C9600	
2-D Barcode Scanner	Metrologic		Portable Scanner



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DRE			
12" Non-ADA Voter Terminal	ES&S	9.1.6.0	DRE & audit printer
12" ADA Voter Terminal with 3 Button Audio	ES&S	9.1.6.0	DRE & audit printer
15" Supervisor iVotronic Terminal	ES&S	9.1.6.0 & 9.1.6.1	DRE & audit printer
15" ADA Voter Terminal with 3 Button Audio	ES&S	9.1.6.0	DRE & audit printer
15" ADA Voter Terminal with 4 Button Audio w/ attached RTAL printer	ES&S	9.1.6.0 Printer FW 1.1	DRE & audit printer
Communication Pack	ES&S		Seiko instruments printer & modem
Tabulators			
M100	ES&S	5.2.0.0	Optical Scanner - precinct
M650	ES&S	2.1.0.0	Optical Scanner - central



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*Functional Changes from ES&S 3.0.1.0 to ES&S 3.0.1.1*

#	Change	ITA Test Method
<b>Changes from Unity 3.0.1.0 to Unity 3.0.1.1</b>		
1	M100 Halted with a message advising the poll worker how to handle the halt. In the past there was an error message however, it did not tell the poll worker how to handle the halt.	Firmware 5.2.0.0 displayed the halt message and on firmware 5.2.1.0 viewed the new displayed message and verified the message was clearer then the pervious firmware version and that a poll worker would know what to do.
2	Added coded ballot set up in the EDM to be set up in either the Master Polling Place or Edit/Add Polling place menu options for display on the iVotronic.	Set the coded ballot menu option to display on the iVotronic. The election official could set this option in either the "Master Polling Place or Edit/Add Polling Place" settings of the EDM.
3	Coded ballot prompt configuration Menu now appears on the iVotronic.	A menu option now displays on the iVotronic, when set at the EDM, to select a coded ballot. Once a poll worker selects the option the poll worker would then select Display ballot. The voter would then start voting. Since the functionality did not change on how it is read into the ERM that was not re-tested.
4	RTAL- reduced paper usages	Validated at the top of each voting section the RTAL prints smaller to save paper space.
5	Pulling of a PEB during the while attempting to unlock early voting on the iVotronic when the users in the in "Unlock Password" screen the system will shut down until the user inters the PEB back into its slot. The audit log will not read this as the user has not logged in. The audit log will show however, how many times the user re-entered the "Unlock Password" screen.	Attempted many times to freeze iVotronic, however, when a user has pulled the PEB the iVotronic will now shut down. The audit log does not reflect this since no one has logged on. Once someone has logged in the audit log will reflect the shut down steps. The audit log does display how many times the user enters the unlock early password screen.
6	When loading audit files from an iVotronic into the ERM an .EBN file is created. If an election official attempts to re-read the same audit log then the .EBN file remains but a new file is created using the same # but instead of an .EBN displaying after the file name .001 will display.  The number will increment every time the same audit lot is read in (i.e. .002, .003).	Verified the increment by copying in the same audit file multiple times.



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## Compliance Checklist

<b>Vendor: ES&amp;S</b>		<b>Voting System: Unity 3.0.1.1 &amp; AutoMark 1.1</b>	
<b>Pre-Test Review</b>			
• Is Form 100 complete and satisfactory?	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
• Review Form 100 - Schedule A - Have recommendations/issues made from previous exams been corrected or addressed?	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
• Review Form 101 - Are responses satisfactory?	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
• Review change logs and provide information for testing or questioning vendor	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
• Training manuals appear complete?	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
• Training manuals appear to be easy to use?	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
• Technical Bulletins for the previous year were provided and reviewed.	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Verify Installation</b>			
• Verify/List all hardware	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
• Verify/List all COTS hardware/software versions	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
• Is the COTS hardware being demonstrated the same version as what was tested at the ITA?	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
• Is the COTS software being demonstrated the same version as what was tested at the ITA?	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
• Witness or actual install the software and firmware with the SOS CDs received from ITA.	Yes	No	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

<b>Vendor: ES&amp;S</b>		<b>Voting System: Unity 3.0.1.1 &amp; AutoMark 1.1</b>	
<b>Texas Law</b>	<b>Federal Law</b>		
<b>Electronic Ballot Marker Review (AutoMark)</b>			
TEC 122.001	• Preserves the secrecy of the ballot	Yes	No
		<input checked="" type="checkbox"/>	<input type="checkbox"/>





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TEC 122.001		• Is suitable for the purpose for which it is intended	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Operates safely, efficiently, and accurately and complies with the error rate standards of the voting system standards adopted by the FEC (EAC)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Is safe from fraudulent or unauthorized manipulation (physical exam and review of manuals)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Permits voting on all offices and measures to be voted on at the election	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	HAVA	• Warns of Overvote - Prevents counting votes on offices and measures on which the voter is not entitled to vote	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	HAVA	• Warns of Undervote	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Prevents counting votes 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	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Prevents counting a vote on the same office or measure more than once	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Permits write-in voting	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Is capable of permitting straight-party voting	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 65.007		• Is capable of cross-over votes	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	HAVA	• Is capable of providing records from which the operation of the voting system may be audited	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"/>
		• 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"/>
		• Does the system have any RF (Radio Frequency) communications?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
		• Have representatives of the visually impaired community evaluated the accessibility of the system?	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"/>
		• Does system include paddles for accessibility	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>



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<b>DRE Review (iVotronic)</b>				
TEC 122.001		• Preserves the secrecy of the ballot	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Is suitable for the purpose for which it is intended	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Operates safely, efficiently, and accurately and complies with the error rate standards of the voting system standards adopted by the FEC (EAC)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Is safe from fraudulent or unauthorized manipulation (physical exam and review of manuals)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Permits voting on all offices and measures to be voted on at the election	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	HAVA	• Warns of Overvote - Prevents counting votes on offices and measures on which the voter is not entitled to vote	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	HAVA	• Warns of Undervote	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Prevents counting votes 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	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Prevents counting a vote on the same office or measure more than once	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Permits write-in voting	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Is capable of permitting straight-party voting	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 65.007		• Is capable of cross-over votes	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	HAVA	• Is capable of providing records from which the operation of the voting system may be audited	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		• Reports available by precinct?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		• In order to perform a manual recount, can you print cast vote records for a precinct (including early voting, ED and absentee?) for votes cast on a DRE?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TAC 81.176		• A DRE must have the capability to segregate provisional votes from regularly-cast votes on the precinct returns	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TAC 81.176		• The precinct returns must indicate the number of provisional ballots cast but not include actual provisional votes in the unofficial totals from the precinct	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TAC 81.176		• Must provide a method for the cast provisional ballots to be accepted & added to the election results	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		• Must be designed to not accept provisional write-in votes until the provisional vote has been accepted/approved.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.033		• Equipped with a security system capable of preventing operation of the machine	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.033		• Equipped with registering counters that can be secured against access	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>



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TEC 122.033		• Equipped with a public counter	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.033		• Equipped with a private counter	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 127.154		• Does each unit have a permanent identification number?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		• Capability to have more than one ballot style available on a machine (used for consolidated precincts and early voting)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		• Can you easily choose the ballot style used on a DRE?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
HAVA		• Provide voters with disabilities the same opportunity for access & participation (including privacy & independence)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		• Usability of taking system to curbside voter	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
HAVA		• Allow voter to review selections before casting ballot	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
HAVA		• Allow voter to change selections before casting a final vote	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		• Do multiple choice selections appear on summary screen? EX: vote for 2 or more	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		• Does the system have any RF (Radio Frequency) communications?	Yes <input type="checkbox"/>	No <input checked="" 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"/>
		• Have representatives of the visually impaired community evaluated the accessibility of the system?	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 low mobility	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>VVPAT Review (iVotronic RTAL)</b>				
TEC 122.001		• Preserves the secrecy of the ballot	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Is suitable for the purpose for which it is intended	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Operates safely, efficiently, and accurately and complies with the error rate standards of the voting system standards adopted by the FEC (EAC)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		• Is safe from fraudulent or unauthorized manipulation (physical exam and review of manuals)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	HAVA	• Is capable of providing records from which the operation of the voting system may be audited	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		• The system shall permit the voter to correct any discrepancy between the electronic vote (summary screen) and the paper record before the vote is cast.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		• Is a paper record of each individual vote cast generated?	Yes <input type="checkbox"/>	No <input type="checkbox"/>



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		Yes	No
	• Is the paper record maintained in a secure fashion?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	• Has all items printed that would be needed to use as a manual count of the votes cast?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	• The paper printout includes notice if the printout has been voided by the voter?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	• Does the VVPAT print out have headers with precinct information that would allow a precinct by precinct recount?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Texas Real-time Audit Log Review</b>			
TEC 81.62	<ul style="list-style-type: none"> <li>A central tabulating device must include a continuous feed printer dedicated to a real-time audit log, which prints out all significant election events and their date and time stamps.</li> </ul> <p>See VVSG 2005:</p> <p style="margin-left: 40px;">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 style="margin-left: 40px;">2.2.5.2.1.g: "The system shall be capable of printing a copy of the audit record."</p>	Yes	No
		<input checked="" type="checkbox"/>	<input type="checkbox"/>
TEC 81.62	<ul style="list-style-type: none"> <li>Log error messages and operator response to those messages</li> </ul> <p>See VVSG 2005 Section 2.2.5.2.2.a &amp; 4.4.3.d</p>	Yes	No
		<input checked="" type="checkbox"/>	<input type="checkbox"/>
TEC 81.62	<ul style="list-style-type: none"> <li>Log the number of ballots read for a given precinct</li> </ul> <p>See VVSG 2005 Section 4.4.4.a &amp; c &amp; e</p>	Yes	No
		<input checked="" type="checkbox"/>	<input type="checkbox"/>
TEC 81.62	<ul style="list-style-type: none"> <li>Log completion of reading ballots for a given precinct</li> </ul> <p>See VVSG 2005 Section 4.4.3.b.3</p>	Yes	No
		<input checked="" type="checkbox"/>	<input type="checkbox"/>
TEC 81.62	<ul style="list-style-type: none"> <li>Log the identity of the input ports used for modem transfers from precincts</li> </ul> <p>See VVSG 2005 Section 4.4.2.g.1-4</p>	Yes	No
		<input checked="" type="checkbox"/>	<input type="checkbox"/>
TEC 81.62	<ul style="list-style-type: none"> <li>Log users logging in and out from election system</li> </ul> <p>See VVSG 2005 4.4.3.a.4, 4.4.3.d, 6.5.5.a &amp; c</p>	Yes	No
		<input checked="" type="checkbox"/>	<input type="checkbox"/>
TEC 81.62	<ul style="list-style-type: none"> <li>Log precincts being zeroed</li> </ul> <p>See VVSG 2005 4.4.3.b.2</p>	Yes	No
		<input checked="" type="checkbox"/>	<input type="checkbox"/>
TEC 81.62	<ul style="list-style-type: none"> <li>Log reports being generated</li> </ul> <p>See VVSG 2005 4.4.3.d</p>	Yes	No
		<input checked="" type="checkbox"/>	<input type="checkbox"/>
TEC 81.62	<ul style="list-style-type: none"> <li>Log diagnostics of any type being run</li> </ul> <p>See VVSG 2005 4.4.2.a &amp; d</p>	Yes	No
		<input checked="" type="checkbox"/>	<input type="checkbox"/>



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		<ul style="list-style-type: none"> <li>• 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</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		<ul style="list-style-type: none"> <li>• Print starting the tally software (e.g. from the operating system) or exiting the tally software, or any access to the operating system.</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		<ul style="list-style-type: none"> <li>• Record if a printer is paused, turned off, turned on, disconnected, and when reconnected.</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>Optical Scan System Review (M100 &amp; M650)</b>				
TEC 122.001		<ul style="list-style-type: none"> <li>• Preserves the secrecy of the ballot</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		<ul style="list-style-type: none"> <li>• Is suitable for the purpose for which it is intended</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		<ul style="list-style-type: none"> <li>• Operates safely, efficiently, and accurately and complies with the error rate standards of the voting system standards adopted by the FEC (EAC)</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		<ul style="list-style-type: none"> <li>• Is safe from fraudulent or unauthorized manipulation (physical exam and review of manuals)</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		<ul style="list-style-type: none"> <li>• Permits voting on all offices and measures to be voted on at the election</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	HAVA	<ul style="list-style-type: none"> <li>• Warns of Overvote - Prevents counting votes on offices and measures on which the voter is not entitled to vote</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	HAVA	<ul style="list-style-type: none"> <li>• Warns of Undervote</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		<ul style="list-style-type: none"> <li>• Prevents counting votes 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</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		<ul style="list-style-type: none"> <li>• Prevents counting a vote on the same office or measure more than once</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		<ul style="list-style-type: none"> <li>• Permits write-in voting</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001		<ul style="list-style-type: none"> <li>• Is capable of permitting straight-party voting</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 65.007		<ul style="list-style-type: none"> <li>• Is capable of cross-over votes</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	HAVA	<ul style="list-style-type: none"> <li>• Is capable of providing records from which the operation of the voting system may be audited</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		<ul style="list-style-type: none"> <li>• Reports available by precinct?</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		<ul style="list-style-type: none"> <li>• In order to perform a manual recount, can you print cast vote records for a precinct (including early voting, ED and absentee?) from an individual DRE?</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 127.154		<ul style="list-style-type: none"> <li>• Does each unit have a permanent identification number?</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		<ul style="list-style-type: none"> <li>• Is there a way to properly secure all ports on the system?</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>



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	<ul style="list-style-type: none"> <li>Are instructions provided in the documentation for securing the system?</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>Central Scanner Review (M650)</b>			
	<ul style="list-style-type: none"> <li>Check the calibration and sensitivity of the scanner. Does it pick up marks for votes that would be counted during a recount?</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	<ul style="list-style-type: none"> <li>Does it meet the requirements of the Real-time Audit Log (required for central scanners)?</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>Precinct Scanner Review (M100)</b>			
TAC 81.52 (C)(1&4)	<ul style="list-style-type: none"> <li>Check the calibration and sensitivity of the scanner. Does it pick up marks for votes that would be counted during a recount?</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
HAVA	<ul style="list-style-type: none"> <li>Warns of Undervote</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TAC 85.032	<ul style="list-style-type: none"> <li>Can 2 locks be placed on the scanner ballot box to secure ballots?</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>Central Accumulator Review (Unity 3.0.1.1 ERM)</b>			
TEC 122.001	<ul style="list-style-type: none"> <li>Preserves the secrecy of the ballot</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	<ul style="list-style-type: none"> <li>Is suitable for the purpose for which it is intended</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	<ul style="list-style-type: none"> <li>Operates safely, efficiently, and accurately and complies with the error rate standards of the voting system standards adopted by the FEC (EAC)</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	<ul style="list-style-type: none"> <li>Is safe from fraudulent or unauthorized manipulation (physical exam and review of manuals)</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	<ul style="list-style-type: none"> <li>Permits voting on all offices and measures to be voted on at the election</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	HAVA <ul style="list-style-type: none"> <li>Warns of Overvote - Prevents counting votes on offices and measures on which the voter is not entitled to vote</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	HAVA <ul style="list-style-type: none"> <li>Permits Undervotes</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	<ul style="list-style-type: none"> <li>Prevents counting votes 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</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	<ul style="list-style-type: none"> <li>Prevents counting a vote on the same office or measure more than once</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	<ul style="list-style-type: none"> <li>Permits write-in voting</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
TEC 122.001	<ul style="list-style-type: none"> <li>Is capable of permitting straight-party voting</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	<ul style="list-style-type: none"> <li>Reports from the central accumulator should be in a format that facilitates an effective audit during a recount.</li> </ul>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>



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### Additional Examiner Notes

1. Programming of the ES&S Unity system is very complex and therefore prone to operator error. Many options are available that provide for state specific requirements in other states but would be inappropriate for use in Texas. The complexity of the programming and the number of options makes the system prone to user error with the result that a system may not function correctly to the procedures specified in Texas.

Programming instructions, well written procedures and templates are an option to guard against programming errors and inappropriate selection of options for the system. It is recommended that such instructions and templates be prepared to assure that machines are programmed and used correctly.

The system currently offers options that do not apply for Texas. An example of the kind of issue that can arise is in the area of a 'fleeing voter'. In a situation where a voter has voted their choices but not cast the vote what options should be available to the poll worker? For most states the options are to either accept or cancel the ballot. However, some states require other procedures. Only the procedure mandated for use in Texas should be available when programming equipment for use in Texas. This would avoid the possibility of a system being incorrectly programmed and mistakes being made by poll workers and others.

2. Pre-election programming of the iVotronic units requires that the flash memory and the PEB module contain the same ballot information. This requirement is a positive safeguard of the system. However, it can lead to confusion and delays if any variations to the ballot result in a mismatch. The pre-election programming should be done following carefully prepared procedures and verified during the logic and accuracy testing, using the same ballot which will be used in the election.
3. The ES&S system is very flexible, offering many options in both the programming and to the operator. Additional checks and functions could be provided to protect against user errors. One example of such a check would be to allow poll workers or others to enter the number of voters who were signed in to vote and for the system to check that number against the number of votes recorded. The numbers should match exactly and a failure of the check would allow for an immediate check as to the possible cause.

A specific risk is presented by the Election Reporting Manager, which



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presents the operator with several options when accumulating votes. Some options will add votes from each memory module to the total while others will replace the totals with the new data. These options make it possible that mistakes could be made leading to incorrect results being accumulated. Routine manual review and audit of the election should identify such errors. However, a prompt and automated assistance in making these checks would increase the probability that they would be identified and corrected early. No votes would be lost as the original data would continue to be available on both the memory modules and the on-board memory in the voting equipment. However, to avoid the possibility of confusion these checks would be helpful.

4. The ES&S system is composed of several individual units and software modules. Currently when starting a new election the election official must manually assure that all components are properly set and all totals zeroed to start a new election. The system does not offer a system function that checks and confirms that all units and modules are in the proper state to start an election with all totals zeroed. An automated check to assure that all units and modules have been properly set for the start of an election would be helpful.
5. A summary of the comments above is that the flexibility of the system creates complexity and with it the potential for operator errors. A review of the system for operator ease of use and resistance to operator error would be a significant improvement to the system.





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### **Annex A – Delivery and Verification of Software and Firmware**

#### *File Signatures - ES&S Unity 3.0.1.1 and AutoMark 1.1*

##### **Chain of Custody**

The software and firmware for the system was requested from the ITA (Independent Testing Authority) and delivered directly from them. The software and firmware was sent on 2 CD's. The representatives of ESS verified that the software delivered from the ITA was the software they had submitted for certification. This procedure provided a vendor independent delivery of the NASED certified software and firmware.

##### **The build environment**

The VSG 2002 standard requires the ITA to supervise a witness build of the code to be used. A clear record of the executable files produced by the build is necessary. This would certainly include the recording of the digital signatures of all executable files produced. The EAC has incorporated these elements into its certification system and it may be expected that future state certifications will have the added benefit of these protective measures.

However, the software and firmware used in the ESS Unity 3.0.1.1 and AutoMark 1.1 systems did not have file signatures recorded at the time of the witness build and have not been deposited with the NIST NSRL (National Institute of Standards and Technology National Software Reference Library). To address these deficiencies the ITA was asked to deliver the software that they certified directly. Two CD's were received directly from the ITA. The software and firmware was confirmed by ESS to be the software and firmware they had submitted for certification. Thus the principle of multiple independent witnesses was applied.

##### **File Signatures**

A self-booting CD, containing the Knoppix (Linux) operating system and the NARA software to check file signatures was provided directly from the NIST NSRL staff. A PC with 2 CD drives was booted from this CD. This assured that only software provided by the examiner was used to obtain file signatures. The CD's obtained from the ITA were inserted in the second CD drive and file signatures were obtained for all files on the CD's. The results were stored onto a USB drive, also provided by the examiner. Thus, the file signatures of the software and firmware examined for state certification were obtained. These file signatures can then be used to verify that the software and firmware installed for use in elections is identical to that approved for state certification.



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### **PC System Information**

The system information utility provided with the windows operating system was used to obtain the configuration of the PC's supplied for the examination. The system configuration information was saved to a USB drive as a record of the systems submitted for certification.

### **State Certification & Pre or Post Election Verification**

Using the file signatures obtained during the examination a local official performing pre or post election verification should be able to confirm that all software is valid and unmodified from its certified version. However, to do this requires tools that have yet to be fully developed. For the software resident on PC's the self-booting CD used in this exam, with the addition of a signature comparison function, would be necessary to confirm that the software loaded is identical to that certified. For voting stations and optical scanners their firmware would have to be verified before it is loaded and after that assured by the physical security and seals placed on the device.



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**Annex B –NASED Systems Certification**

<p><b>ES&amp;S</b></p>	<p>Unity 3.0.1.1</p>	<p>Audit Manger v. 7.3.0.0 Election Data Manager v. 7.4.4.0 Ballot on Line 1.2.0.0 ES&amp;S Image Manager v. 7.4.2.0 iVotronic Image Manager v. 2.0.1.0 Optech Image Manager v. 4.0.0.0 Hardware Programming Manager v.5.2.4.0 Data Acquisition Manager v. 6.0.0.0 Election Reporting Manager v. 7.1.2.1 AutoMARK AIMS 1.2.18 <b>(All Modules 2002)</b></p>	<p>iVotronic DRE Firmware v. 9.1.6.0, 9.1.6.1, &amp; 9.1.6.2 <b>(2002)</b> Model 100 Optical Scan Precinct Ballot Counter Firmware v. 5.2.1.0 <b>(2002)</b> Model 650 v. 2.1.0.0 <b>(2002)</b> AutoMARK Voter Assist Terminal (VAT) 1.1 - Firmware v. 1.1.2258 <b>(2002)</b> AutoMARK Voter Assist Terminal (VAT) 1.0 - Firmware v. 1.1.2258 <b>(2002)</b> Real-Time Audit Log Printer Compact Flash Multi-card Reader/Writer ***Model 150/550 v. 2.1.2.0 Optech IV-C v. 1.06a and 1.07a Eagle v. 1.50 APS, 1.28 HPS, 1.02/C1.04 CPS Eagle v. 1.52 APS, 1.30 HPS, 1.08a CPS</p>	<p>N-2-02-22-22-007 (2002)</p>	<p>8/31/2006</p>
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