



**U. S. ELECTION ASSISTANCE COMMISSION**  
**VOTING SYSTEM TESTING AND CERTIFICATION PROGRAM**  
1225 New York Avenue, NW, Suite 1100  
Washington, DC. 20005

July 25, 2008

Mr. James Nilius  
Senior Director, VSTL  
SysTest Labs, LLC.  
216 16<sup>th</sup> Street, Suite 700  
Denver, CO 80202

Dear Mr. Nilius,

This letter is intended to address and seek clarification of correspondence (attached) between SysTest Laboratories (SysTest) and Election Systems and Software (ES&S) regarding the testing of an ES&S system. The correspondence was sent on July 16, 2008 from Systest to ES&S with several SysTest employees cc'ed. The e-mail with a subject heading of "Test Cases – Volume, Performance, Stress, and Recovery" contains statements that are concerning to the EAC given SysTest's status as an EAC accredited Voting System Test Laboratory (VSTL) and its obligations as an independent tester of voting systems under the EAC's program.

Based upon this correspondence, EAC has concerns that SysTest is allowing and inviting manufacturers to play an inappropriate role in the development of test plans. While VSTLs may need to make technical inquiries to manufacturers, it is not appropriate for a manufacturer to be directly involved in creating plans for testing their own system. In addition, the email contains language in which SysTest sets a goal "to ensure certification" of manufacturer's system. This statement may be read as an inappropriate promise of certification. EAC VSTL's are responsible for the independent testing of a voting system to the appropriate standards and should not have as the end goal the certification of the voting system.

As you are aware Section 4.4. of the EAC's recently adopted *Voting System Test Laboratory Manual* (Laboratory Manual) allows for the EAC to request documents or information as part of its compliance management program. In light of the statements above and the importance of the independence of the testing process, the EAC requests answers to the following interrogatories and requests for documents pursuant to Section 4.4. of the Laboratory Manual:

1. What role do manufacturers play in the development of test plans by SysTest Laboratories?

2. Describe in detail the internal processes used by SysTest Laboratories in the creation of test plans for voting systems and the procedures used to prevent manufacturer influence of the test plan creation process.
3. Provide any written policies in effect as of 7/16/2008, which guided SysTest staff regarding the participation of manufacturers in the test plan development process.
4. SysTest stated in its correspondence with ES&S that one of its considerations in the creation of the test plan was to "...ensure certification." Clarify what SysTest meant by this statement, given its role as an independent testing laboratory.

Per Section 4.4.2 of the Laboratory Manual, the EAC requests that you respond to the interrogatories posed within twenty (20) days of receipt of this notice. Please be aware that you may supplement any answer with documentation supporting your responses. Also, per Section 4.8 of the Laboratory Manual the EAC will issue a compliance management report based on the information provided by SysTest in response to the interrogatories posed *if* there is an indication of a noncompliance with program requirements.

If you should have any questions or concerns regarding this request for information please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Brian J. Hancock". The signature is fluid and cursive, with the first name "Brian" and last name "Hancock" clearly legible.

Brian J. Hancock  
Director of Testing and Certification

Attachment: 7.16.08. email from SysTest Laboratories to Election Systems and Software.

**From:** Ron Thomas [mailto:rthomas@Systest.com]  
**Sent:** Wednesday, July 16, 2008 11:11 PM  
**To:** Munguia, Sue; Pearson, Steve  
**Cc:** Darrick Forester; Kelly Swift; Dharma Valdez  
**Subject:** Test Cases - Volume, Performance, Stress, and Recovery

Hi,

Earlier today I sent out test cases that without any test approach are inadequate and lack any type of focus. I will apologize for this, but it was in response to trying to meet a deadline to deliver high level test cases for this project. With that statement made and out of the way, let me define a test approach in this email that we can review as a team in an effort to meet or exceed the feedback we have received from the EAC.

The test approach being defined takes into consideration the following:

- Reduce the amount of time required for Data Creation and Test Execution
- Ensure we meet VSS 2002 Requirements and ensure certification
- Ensure that the equipment meets and exceeds all VSS 2002 Requirements for a positive Voter experience and EAC experience.

Systems or components applicable to tests:

- DS200
- M100
- M650
- iVO
- PCMCIA
- Flash
- PEB
- DAM (host and client)
- Modeming
- Networking
- ERM
- HPM

Risks: The number of equipment that will be required to execute these tests.

#### **Volume:**

As defined in the VSS requirements and based upon conversations with the EAC, the following approach is being used to account for Volume Testing:

6.2.3 - For all systems, the total number of ballots to be processed by each precinct counting device during these tests shall reflect the maximum number of active voting positions and the maximum number of ballot styles that the TDP claims the system can support.

A. 4.3.5 - **Volume tests:** These tests investigate the system's response to processing more than the expected number of ballots/voters per precinct, to processing more than the expected number of precincts, or to any other similar conditions that tend to overload the system's capacity to process, store, and report data;

Based upon the meeting that occurred between the EAC, ES&S and Systest Labs, it was verbally confirmed that using the largest jurisdiction the vendor sells to would meet what the EAC is

looking for in regard to Volume testing. Also during the same meeting, Tom Watson verbally stated that we could use the data definitions from that jurisdiction to execute the testing.

Based upon that information, here is what we gathered from Kevin.

We would use the 2008 Cuyahoga Primary Election.

Languages: English only

Parties: 3 (Including Nonpartisan)

Offices: 532

Text/Referendums: 47

Precincts: 1482

Polling Places: 609

Candidates: 707 (this does not include the response fields from the 47 referendums, i.e. Yes/No)

Ballot Styles: 1482 X 3 = 4446

Ballots/Voters per precinct = 1500 (note that this is the number of ballots printed per precinct)

I would like to discuss the following questions:

What is the maximum number of precinct devices existing per polling place?

How many ballots per device is being processed?

What type of devices are being used?

Can we get election results to use for testing?

Can we build the ERM database to contain a large amount of data and execute reports?

Without actually voting on devices, can we transmit a large volume of data from precinct devices to the ERM? Do we have Media that contains this data?

What other devices or components would contain large amounts of data?

Is there a way to generate election results data that can be used for verification purposes?

This data would need to be validated for accuracy.

Test Approach for Volume:

Since Volume testing identifies how much data can be processed, stored, and maintained on a voting system without degradation in performance, corruption of data, etc, I would like to use the election definition files from Cuyahoga's primary election. We could then use this election definition to burn any necessary media, create ballots, etc. to generate a large volume of data at multiple precinct locations that can then be transmitted / transferred to the ERM system. Since the ERM is considered a database, we will need to print reports while the system contains a large volume of data (in this case, large volume of data is equal to the amount of data that is generated during an election at Cuyahoga County +). We will also verify that transmission of data, storage of data, and generation of reports is not impacted if any components of the system or database contains a large amount of data. The generation of data would have to occur beyond one precinct and surpass the amount of data that would be generated by the Cuyahoga's election to meet and exceed the VSS requirement for Volume. Any case where limitations apply, those initiations must be documented in the limitations document as well as in the test case.

**Stress:**

**A. 4.3.5 - Stress tests: These tests investigate the system's response to transient overload conditions. Polling place devices shall be subjected to ballot processing at the high volume rates at which the equipment can be operated to evaluate software**

**response to hardware-generated interrupts and wait states. Central counting systems shall be subjected to similar overloads, including, for systems that support more than one card reader, continuous processing through all readers simultaneously;**

Test Approach for Stress:

Based upon the feedback contained within the matrix, the DAM Host was highlighted with a test scenario that the EAC would like to see multiple simultaneous connections to the DAM Host transferring data. Using the same configuration, data, etc as we are using for Volume or another test case, we can generate the necessary traffic to max out the DAM Host and the networked 650 to include uploading election definitions to the 650 as well as transferring vote data back to the ERM. Additional focused tests regarding the HPM, Storage Media, and ERM will need to be created to stress these systems/components out. I am still working through documentation to clarify the test case definitions for these and I am hopeful that we can execute these type of tests with minimal effort. These tests are focused on system level and not hardware level types of tests.

**Error Recovery:**

A 4.3.5 - **Recovery tests:** These tests verify the ability of the system to recover from hardware and data errors.

Vol 1: 2.2.3

Test Approach for Error Recovery:

The Electrical Supply test covers 2 of the 3 requirements defined in Vol 1: 2.2.3. I am working with AI on the 3rd requirement.

Additional error recovery tests would include exceeding the total amount of connections to the DAM Host from each device to ensure the device does not corrupt any data and that proper communication of vote data is transmitted after a successful connection. Based upon the number of socket connections that exists between the 650's and the ERM system we may be able to define a test case that would validate error recovery. Execution of the Stress test cases may allow us to validate additional error recovery tests that would not normally be seen.

**Performance:**

I am currently reviewing all the performance requirements defined in the VSS as the word performance is used very loosely in the VSS. I hope to have this completed by COB Friday.

A few other items to note:

The Vendor may submit test results from State Certifications where these type of tests have been executed for review by the EAC. I will locate the requirement and let you know.

The Vendor may submit test cases and test results that cover the tests outlined above to the VSTL for review. Based upon the review and test results, we maybe able to reduce the scope of verification that will be required.

I will work with Darrick to setup a meeting to discuss this email.

Regards,

Ron

Ron Thomas

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