Election Assistance Commission (EAC)
Interim Accreditation
Independent Test Authorities (ITA)

Assessment Report

SysTest Labs, L.C.C.
with
Percept Technology Labs

Conducted: Jul 10-12, 2006
Denver, CO

Assessor: Steven V. Freeman

Introduction

This accreditation assessment was conducted to support an interim program pending implementation of the full EAC Accreditation program in cooperation with the National Voluntary Laboratory Accreditation Program (NVLAP) under NIST Handbook 150-2006, NVLAP Procedures and General Requirements and NIST Handbook 150-22- 2005 NVLAP Voting System Testing (HB 150-22). The interim program is designed to accredit ITAs formerly authorized under the National Association of State Election Directors (NASED) accreditation program to continue voting system testing under an EAC accreditation until such time as the NVLAP/EAC joint accreditation has qualified one or more testing laboratories as Voting System Test Laboratory (VSTL).

Summary of Findings

SysTest Labs with Percept Technology has the basic capability to perform a full range of voting system tests under the Federal Election Commission (FEC) Voting System Standards (VSS-2002). Their qualify management system was written to the earlier NASED Handbook 9201-A, 2001. They are in the process of converting their system to NIST Handbook 150-2006 but currently have a mix between the two. There was evidence through reviews, edits, and approval processes that they are actively engaged in developing and improving their processes and their personnel and top management are fully involved in a quality system and the necessary adaptations to respond to new requirements.

To perform this assessment, an interim checklist was created to implement the requirements of ISO/IEC 17025 as the NVLAP standards and checklists could not be used. This same checklist is being used for all three ITAs to check compliance and a work copy is being delivered to the labs for their reference on meeting unsatisfied requirements.

Deficiencies found in SysTest Labs/Precept assessment are classed as:
* on-going work which is expected to show progress and follow-up at the next assessment review but may not necessarily be fully completed as a continuous process of improvement,
* minor deficiencies whose correction are to available for review to EAC within 120 days or an alternative date set between the lab and EAC.
* major deficiencies which the lab needs to respond to within 30 days with a plan of corrective action and scheduled return visit.

(A successful assessment and recommendation for accreditation by NVLAP as a VSTL may, with EAC approval, may satisfy the requirement for a scheduled return assessment.)

On-going work. All the deficiencies in this category are due to the drafting and rewriting of the new procedures to the ISO/IEC standards. The process of reviewing, rewriting, and approving new procedures is an on-going process and should show evidence of the underlying quality management process is being used. This area also includes the process of adapting new EAC procedures which have not yet been approved.

Minor deficiencies:
1. The internal audits were against specific procedures or issues and did not encompass the review of management qualify processes required under the accreditation guidelines. This is ameliorated by the fact the review and revision on going with the change over to the new Quality System Manual is performing the same function, only lacking the formal record keeping of issues and corrective action plans needed to support the annual management review.

2. There is no record of a formal management review during the past year that could be presented for the assessment. Top management involvement with the change over to the new Quality System Manual, like the internal audits, is performing much of the same function with weekly management reviews but lacks formal record and the overall review of progress over the longer time period of an annual review.

3. There is no formal recording of complaints and reports of non-compliance for review and analysis. Complaints are being handled immediately and through weekly management reviews but there is not the formal record of the complaints that would support analysis of trends or follow-up review through later audits or management reviews.

4. Test methods exist as templates and test scripts but need to be placed under the controlled document system and their validation, where required, documented. The new SLPs planned or in draft are providing the mechanism to do this but do not include the validation component.

5. The copy of the VSS-2002 used was not current and the checklist used to trace completion of requirements derived from that VSS-2002 version was not complete. A new checklist to correct this problem should include adoption of the VVSG-2005 changes where appropriate. Note: this problem exists for all the labs as the checklist involved; was initially created and intended to be used as a common reference; the correction and replacement should involve a similar common document.

Major deficiencies.

1. Several of the labs used as subcontracted labs are not accredited by an IOC/IEC 17025 based accreditation body. This problem is partially a problem within the standards and EAC draft policies themselves as 17025 accreditation is not necessarily the appropriate method for validating labs performing the tests under quality standards (for example, the safety and accessibility standards). However, an accreditation program does exist for the Mil-Std 810 standards but is not held by the subcontracted lab, APT, performing the related tests.

Recommendation

Accreditation should be continued as a full service ITA provisionally based on continued development and follow through on the reported deficiencies, to be reviewed in 120 days or at such time as directed by the EAC. Some issues are dependent on clarification of procedures through the EAC.

(signed)

Steven V. Freeman

Attachments:

A. Laboratory Identification and Contacts.
B. Organization Chart as/of 7/10/06.
C. EAC Interim Checklist Summary of Findings. (In draft)
D. Core Voting System Tech Supplemental Checklist.doc (In draft)

Laboratory Identification and Contacts

Lead Laboratory:

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USA

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Internet: www.systest.com

Key Contacts:	See Organization Structure 10 July 2006 (Attach A)	
President	Brian Phillips	BrianP@Systest.com
Chief Operating Officer	Glenn Truglio	
Director, Qualification Test Services	James Nilius	jnilius@systest.com
Qualify Assurance Director	Jeff Knutson	jknutson@asystest.com
Hardware Manager	Darrick E. Forester	
Source Code Review Manager	Jo Johnson	
Managers, Voting Test Specialists	Jennifer Garcia	
	Jeff Knutson	
Delivery Manager	Lesley Hoppert	

Environmental Hardware Team Partner:

Legal Name: Percept Technology Labs, Inc.
Address: 4888 Pearl East Cir. #110
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Telephone (303) 444-7480
www.percept.com

Key Contacts:

Brian G. Cleveland, President & CEO
John J. Mozeliak, Chief Operating Officer
Al Backlund, Director of Global Compliance Business Unit

Technical Supplement:

Review test lab procedures/standards for the following elements of the VSS 2002 (and VVSG 2005).

Core voting system tests:
_____ 1 Technical Data Package review,
OK/C SLP-VC-07 PCA Documentation Review
        PCA Document Review.
_____   a   Verify that TDP contains required document content and identify vendor's document meeting requirements.
OK   Vendor provides document trace and SysTest uses the trace to complete the PCA Doc
          Develops one for each configuration component and the 12 required documents from the
VSS/VVSG
_____   b   Identification of deliverables: Documents or manuals to be delivered to client for operation, maintenance, and training.
C   Task vendor to provide a list of deliverable documents or manuals.
          Supported in QTR, Section 3. "The TDP User/Owner manuals that would be part of the certified system delivered to a purchaser of the system are as follows:
_____   c   Terms and references.
OK   Entry in QTP/QTR Template to include items needing identification
_____   d   Review of documents for completeness and consistency
OK   SLP-VC-07 5.1.3.
          Documents are examined by subject expert, e.g., Software Specification is reviewed by Source Code team, against VSS requirements in that area.
_____   e   Quality Assurance plan
OK   SLP-VC-07, PCA Doc-
          Performed as part of PCA review.
_____   f   Configuration Management
OK   SLP-VC-07, PCA Doc-Quality Assurance
          Performed as part of PCA review
          Also examined and exercised in the Witnessed Build
_____   g   Review of System release change log
          SLP-VC-07, PCA Doc-Change Notes
_____   h   Review of vendor tests. *Includes but not limited to:*
                 i   Readiness Check
                 ii   Operational Status Check
          SLP-VC-08, FCA
          FCA Doc . Have separate template for Software, Hardware, Hardware/Software
          No sampling of vendor tests (perform test method validation)
_____   i   Review of prior test lab tests
          See comments under PCA on accepting reports from other labs.
          If using other ITA reports on earlier product tests, need to validate and report the justification for acceptance of the report.
                 -----Deliverables----
_____   j   TDP Document Trace matrix directory. Matching the document requirements to the vendor's document names or titles.
OK   See above, In application package, exhibit 1.6
_____   k   Production of formal Test Plan
          SLP-VC-05, Qualification Test Plan (Original qualification or modified system)
          Template QTP included in application package Exhibit 1.10

SysTest produced a Pre-Qualification Test Report (QAM 4.1.2) which summarized the results for the test and verification documentation, System Operation, Software, and Hardware Specification reviews. It provides a method to document and report discrepancies in the TDP/PCA document reviews to be resolved and document resolutions. SysTest has replaced this with the production of actual Test Plan to include the discrepancy report. This discrepancy report is carried through and provided as part of the Qualification Test Report.

____ 2 Source code review,

QAM 4.1.3

QSM 4.1.1.9 This is mainly a reference to identifying and assigning personnel to the source code review

   SLP-VC-11, PCA Source Code Review provides the procedures

SysTest has created a set of 'definitions' for different languages: C, C++, C#, Cobol, Delphi, HTML, Java, Oracle SQL, Perl, Powerbuilder, (MS) SQL, Visual Basic, XML. These 'definitions' are tables for reporting against the VSS/VVSG requirements and are used to identify requirements that may not apply.

____ a   Catalog of source code

The SLP-VC-11 does not describe use of Module-Finder. Needs instructions for use.

____ b   Catalog of compilation environment including COTS components of build

SLP-VC-13 Rev 03, 5.1.2 Verify environment to identify components of the build. If changed components are identified or are revealed, the vendor is required to resolve. SysTest requiring copies of the licensed versions to verify use of valid COTS and to assist in detecting modified components but not listed in procedures. Procedures update to include

____ c   Determination of changes from prior review.

SLP-VC-11, Rev 05. 5.3.1. Working off the vendor supplied change documentation but also performing code differences against the components supplied for the Witnessed Build.

____ d   Review for coding conventions and integrity requirements

SysTest has created a set of 'definitions' for different languages: C, C++, C#, Cobol, Delphi, HTML, Java, Oracle SQL, Perl, Powerbuilder, (MS) SQL, Visual Basic, XML. These 'definitions' are tables for reporting against the VSS/VVSG requirements and are used to identify requirements that may not apply. The Module-Finder utility runs a check against some of the requirements to highlight and identify modules requiring specific attention but all modules are subject to a human review by at least two and sometimes more reviewers. This procedure was witnessed. Needs to be recorded in procedures.

____ e   Review for security.

Need documentation of specific features and practices used to review for security. This is being performed by knowledgeable human reviewers. Specific issues currently under review are unbound arrays, pointers, and dynamic structures. SysTest has also, in the past, detected and reported on 'race track' vulnerabilities. Needed for future development is an active process to recognize and adapt reviews to pick up on new vulnerabilities.

   i   Demonstrate
   -----Deliverables-----

____ f   Report of results

SLP-VC-11 PCA Source Code Review, 5.4.2 This process is basically include the source code review forms into the report following code statistics such as line counts provided by the Module-Finder. It is organized by functionality and language. Detailed module by module reports are not provided in the Qualification report but are available through archived test documentation.

____ g Witnessed build from verified source code and COTS.
SLP-VC-13.
Discussed need to identify modules which were reviewed and which executables are
changed. Changes in executables may occur due to build procedure changes or COTS
library changes rather than reviewed source code changes. Need to review Guideline 3
on Witnessed Build for documentation required with the Witnessed Build. Specifically
missing currently is the report to include observed anomalies from the source code
review.

____ 3 Physical configuration audit,
QAM 3.27 Performing Accuracy and Reliability Testing
QSM (refers to SLP)
SLP-VC-09 PCA Software and Hardware Configuration Audit
SLP-VC-23 Hardware Test Management
PC Configuraton Checklist
  Organization:
    Percept handles test cases against hardware requirements
    Derek handles System configuration and environmental description
    Jennifer handles System configuration-functional
    TC-history provides document change history.
  Includes VSS requirement for each item.

____ a Configuration verification against Configuration Management plan
SLP-VC-09, 5.2.2 Verify the test environment. Verifies the equipment under test,
manuals, and supplies presented for testing match the equipment/documentation reviewed
in TDP. Should include physical inspection of components and parts to see that the
equipment design is as defined in documentation include the APL. After any mitigation,
the equipment is audited to ensure configuration is defined and consistent with
documentation. Need to update SLP to reflect the mitigation audit. Procedures include
pictures and physical descriptions of changes and to confirm any Engineering Changes
(EC) are complete. Also discussed issue of component marking to reflect version control
and identification. May need to include diagrams or pictures where a marking change is
required.

____ b Accessibility standards
SLP-VC-23, 5.2 includes provisions for the Common Standarsd portion of the
Accessibility Checklist (a tab in the PCA checklist). SysTest performs the physical
measurements; Percept performs the other checks.
Minor note: VSS 2002/VVSG 2005 do not specify the table height involving a access
limits for someone in a wheel chair. 28 CFR Ch. I (7-1-94) under Americans Disability
Act, identifies the max height as 34 inches for table mounted or elevated equipment.
Recommended to SysTest to include the reference and use in their test method.

____ c Construction, including safety
SLP-VC-23/VSS Vol I 3.2.8. (Note: Typo in VSS 2002. Section 3.2.8 refers to 29 CFR
where App B references 20 CFR. VVSG 2005 corrects to 29 CFR).
Test is performed in Safety Lab under standard methods for 29 CFR.

____ d Validity of operations provided in deliverable manuals
SLP-VC-23/09. Need to update to include reference to maintainability test case.
Percept, under Maintainability Test Case, reviews maintenance manuals
SysTest, under SLP-VC-12 Preparing Test Cases, 5.1.4 to include testing of the vendor's
manuals. Recommendation to include a statement in the Deliverable section of the report
to recognize these manuals have been reviewed.

___ e   Hardware transportation and storage tests.
SLP-VC-23, Table 1, Environmental Hardware.
Issues to consider is ensuring the equipment tested is the same configuration used in final certification and that the operational status check has been validated. Need to include details for operational status check to ensure full verification of components and design. Will involve changes to several SLP. SysTest has been working with ensuring the operational status test is comprehensive and been revising test cases to allow for more comprehensive check.

___ f   Hardware operational environmental test.
Note: The system integration tests for accuracy and reliability (e.1. and 2. below) are conducted in conjunction with this test and the final criteria include all components used to consolidate polling place and jurisdiction results from individual voting machines.
See below e1 and 2..

___ g   EMC and electrical test suit.
SLP-VC-23, Table 1, Environmental Hardware.
Criterion performs this test with oversight by Percept. Criterion is fully accredited for these test under NVLAP. Issue may occur if the vendor brings in reports from other test labs. Need to add procedures to provide review/acceptance criteria for third party reports based on the following three criteria:
  i   Verify test lab is accredited by MRP body
  ii Verify equipment under test is for same configuration as being certified
  iii Verify that operational status check/operations was applicable to a voting system operation.

___ h   Safety inspection.
SLP-VC-23. See item c above. In addition, consider the issue of the third party reports.
  i   Verify test lab is accredited by MRP body
  ii Verify equipment under test is for same configuration as being certified
  iii Verify that operational status check was appropriate
----Deliverables----

___ i   Reports for the hardware, EMC and electrical, and Safety tests and inspections.
If necessary, provide a statement reporting the results of the verification on the applicability of the reports.
SLP-VC-23, 5.6. Need to add procedures to when requested to accept third party reports to document validation of the report for acceptability.

___ j   Directory of deliverables, including hardware and software setup and both application and COTS installed files. (Part of witnessed build documentation)
Qualification Report Template Rev 1.00, 7.4 Appendix for qualification configuration and as a element in the Witnessed Build package. Need to add specifics about designating COTS components that are necessary for certified configuration.

___ 4 Functional configuration audit,
QAM 4.1.1 through 4.21.8 Qualification Review and Test Documents.
QSM (references into SLP) May need to provide overview of test structures and requirements. Needs to provide a section with the generic voting system requirements provided in QAM 4.1.1 through 4.21.8.
  SLP-VC-08 Vendor Test Review
  SLP-VC-05 Qualification Test Plan
  SLP-VC-15 FCA Test Execution – Functional Integrated System
  SLP-VC-16 FCA Test Execution - Regression
  Form FCA 2002 Document Review

____ a   Functional Requirement matrix against technical specification and manuals
          Form FCA 2002 Vendor Testing and TDP Trace
          Form FCA 2002 Document Review.
____ b   Test Specifications for functional requirements
          Form FCA 2002 Vendor Testing and TDP Trace
          Form FCA 2002 Document Review. Includes vendor tests reviewed.

____ c   Verify functional operation against requirements of Vol I, §2 thru §6 (See
          Requirements Checklist)
          SLP-VC-12 FCA Preparing Test Cases
          Core set of test cases
            Accuracy Test Case
            System Gen01
            System Gen03-Rotation
            System Gen04-Addl Languages
            System Gen02-Straight Party
            System Pri01- Open Primary
            System Pri02 – Closed Primary
            System Pri03 – Blanket Primary
           Security Test cases
             Baseline Test Case
             Telecom Test Case
____ d   Verify functional operation against requirements of vendors technical specification
          and manuals
          Form Supported Functionality Declaration Rev 02 (sales reps provides and vendor
          submits as part of application) used as a basis for developing test cases for these
          additional functionality
____ e   Verify HAVA functional requirements.
          Included in Supported Functionality Declaration to include Provisional, Addl Languages.
          Need to review for other items in 3.01.
                  ---- Deliverables ----
____ f   Provide a Requirement matrix showing which tests performed and requirement
          satisfied.
          Prior version is incomplete. Proposing to use the Hardware & Software FCA Document
          Review of Testing to include reference of actual tested versus accepted earlier tests. May
          require reporting justification for accepting outside/older test reports.
____ g   Report deficiencies encountered and resolutions of deficiencies.
          Note: not all deficiencies will result in a recommendation to not certify.
          SLP-VC-18 Discrepancy report and Test/Review Corrections.
____ 5 System integration tests,
____ a   Accuracy. For non-COTS systems, includes 48 hr environmental operating test.
          SLP-VC-23. Table 1 (Need to add accuracy under Environmental Hardware Test table)
          Earlier had not been doing this test under the 48 hr environment. They have revised
          procedure.
          Need to ensure that the accuracy test includes the transfer of results and accumulation to
          the consolidated reporting.
____ b   Reliability. For non-COTS systems, includes 48 hr environmental operating test.
          SLP-VC-23. Table 1.
          Need to ensure that the reliability test includes the transfer of results and accumulation to
          the consolidated reporting.
____ c   Volume tests, and
____ d   Security tests.

____ e (VVSG 2005) Cryptographic
____ f Telecommunication, as applicable to system design.
____ g System end-to-end of EMS, vote recording, vote tabulation, consolidation, and
         canvass reporting.
         ----Deliverables-----
____ h Report on tests performed and their results.

§ 5.
____ 6 Qualification Test Report
____ a Introduction.
____ b Qualification Test Background (B2)
         i   General Information about the qualification test process. (For outside readers
             not familiar with the ITA testing).
         ii A list and definition of all terms and nomenclature peculiar to the hardware,
             the software, or the test report
____ c System Identification (B3). This is the test hardware and software used in this test.
         i   System name and major subcomponents.
         ii   System Version.
         iii Test support hardware and
         iv   Specific documents (deliverables) from the TDP used to support testing
____ d System Overview (B4). Describes the voting system in terms of
         i   its overall design structure,
         ii   technologies used,
         iii processing capacity claimed by the vendor and
         iv   modes of operation.
         v   (May) include other products that interface with the voting system. *Note:
              Shall include components necessary to consolidate and produce final results
              including telecommunications.*
____ e Qualification Test Results (B5). "This section provides a summary of the results of
         the testing process, and indicates any special considerations that affect the
         conclusions derived from the test results. This summary includes:
         i   Acceptability of the system design and construction based on the
              performance and software source code review.
         ii   The degree to which the hardware and software meet the vendor's
              specifications and the standards, and the acceptability of the vendor's
              technical and user documentation
         iii General findings on maintainability
              (1) Includes notation of specific procedures or activities that are difficult
                  to perform.
         iv   d. Identification and description of any deficiencies that remain uncorrected
              after completion of the qualification test
              (1) that has caused or is judged to be capable of causing the loss or
                  corruption of voting data, providing sufficient detail to support a
                  recommendation to reject the system being tested.
              (2) deficiency in compliance with the security requirements,
              (3) deficiency in compliance with the accuracy requirements,
              (4) deficiency in data retention, and
              (5) deficiency audit requirements are fully described); and
         v   Recommendations to NASED ITA committee for approval or rejection
         vi   Note: Deficiencies that do not result in a loss or corruption of voting data
              shall not necessarily be a cause for rejection.

   ____   f   Appendix Test Operations and Findings (B6)
-    i   Additional details of test results needed to enable understanding of the conclusions. B. b. Organized to reflect the Qualification Test Plan.
-    ii   Summaries of the results of
  - (1) hardware examinations,
  - (2) operating and non-operating hardware tests,
  - (3) software module tests,
  - (4) software function tests, and
  - (5) system-level tests (including
  - (6) security and
  - (7) telecommunications tests, and
  - (8) the results of the Physical and
  - (9) Functional Configuration Audits)

   ____   g   Appendix Test Data Analysis (B7)
-    i   summary records of the test data and
-    ii   the details of the analysis. The analysis includes
  - (1) a comparison of the vendor's hardware and software specifications to the test data, together with
  - (2) any mathematical or statistical procedure used for data reduction and processing.