TESTIMONY

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To. Election Assistance Commission
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EAC Interim Accreditation Program Assessor
RE. EAC Interim Accreditation Program

Thank you for giving me this opportunity to address the Election Assistance Commission (EAC). I appreciate the opportunity to present to you information about the EAC Interim Accreditation Program which I have been working on since July 2006.

EAC Interim Accreditation Program

Last summer, EAC committed to taking over the voting system laboratory accreditation program which had been administered by the National Association of State Election Directors (NASED). EAC has been working with the National Institute of Science and Technology (NIST) to set up a Voting System Laboratory Accreditation Program (VS LAP) with the participation of a national accreditation body. The National Voluntary Laboratory Accreditation Program (NVLAP) was given the task and had started the process but did not expect to provide a fully accredited laboratory until this year. These labs are to be known as Voting System Test Laboratories (VSTL). This left approximately a six month gap between EAC taken responsibility with no laboratory accredited by EAC for testing voting systems for the November 2006 elections and a short period after. The NASED accredited laboratories (called Independent Test Authority or Agent (ITA)) were completing ongoing testing but could not enter into any new testing after the transition without being re-accredited.

The EAC Interim Accreditation Program was setup to provide a temporary re-accreditation for testing against the Federal Election System 2002 Voting System Standards (VSS-2002) and to include Help American Vote Act (HAVA) Section 301 requirements. The program was to be applied to the experienced NASED accredited laboratories which had been conducting testing for the VSS-2002 and a program in place for conducting such testing. The Interim program added three new elements to the accreditation:

a. The laboratories were to accredited based on the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) 17025:2005.
b. Formalizing a process began by NASED, the formal certification test report produced by the testing laboratories that would used as a basis for voting system certification is to be produced as a single report complying with the VVS-2002,

Vol II, App. B standard and would report on the candidate voting system version's compliance with all the requirements of the VVS-2002 tested, not just the 'Software' or 'Hardware' as previously done.

c. The certification testing was to include testing for compliance with the HAVA requirements as well as the VSS-2002 requirements.

ISO/IEC 17025 Titled: General requirements for the competence of testing and calibration laboratories

The ISO/IEC 17025 (commonly abbreviated to just ISO 17025) is an International Standard prepared by the ISO Committee on Conformity Assessment (CASCO). The standard provides requirements that testing and calibration laboratories are expected to meet "if they wish to demonstrate that they operate a management system, are technically competent, and are able to generate technically valid results." [ISO/IEC 17025:2005(E)]. The standards are designed to be supportive where laboratories are part of larger organizations or offer other services that operate a quality management program which is designed to comply with ISO 9001:2000. The ISO 17025 standards will not qualify a lab to be ISO 9001:2000 compliant but does specify additional technical requirements related to test lab operations which ISO 9001:2000 does not provide. The use of the ISO 17025 standard by accreditation bodies and labs facilitates the opportunity to establish acceptability of results from different accredited labs under formal Memorandum of Agreements, and to support cooperation within accreditation programs and between labs to facilitate exchange of information and to assist in solving problems in the consistency and 'harmony' of standards and procedures.

To break this down in more direct terms of expected results, by using an ISO 17025 based accreditation program, accredited labs will have demonstrated basic quality management programs and technical ability to reliably perform, report, and recover/reproduce tests of the applicable standards. This should support being able to accept and compare reports from different labs and to help work on consistency in testing between labs. The use of the standard does not guarantee correct, valid, or uniform results but does support audit and pro-active corrective actions which can lead to these goals.

Applying the ISO 17025 to the EAC Interim Accreditation

The three labs subject to the Interim Accreditation were originally accredited under the NASED program which used a handbook developed from the predecessor of the ISO 17025 (ISO/IEC Guide 25) and draft copies of an earlier ISO 17025 being developed at the time. The NASED Program Handbook 9201 (Rev A) did not have the same references, detail, and experience as the current ISO 17025 but the basic components were there. NASED accreditation assessments since 2001 have used ISO 17025 as a basis for interpretation and applications of the NASED standards with the intention to replace the NASED requirements with an ISO 17025 based standard. The expectation for the EAC

Interim Accreditation was that the laboratories would not have an exact, detailed match with the ISO 17025 and could not be expected to deliver changes to fully comply with ISO 17025 but should have equivalent elements and compatible processes.

As it turned out, the labs were in a better position to apply the ISO standard than I expected. One lab had already made changes to comply with ISO 17025 in preparation for accreditation as a VSTL and were using it, another held accreditation under ISO 17025 for many of the test methods required under different accreditation programs, and the third was with an ISO 9001 compliant organization and had gone through an audit the year before to bring their procedures in line with the corporate program.

The ISO 17025 is not an accreditation standard and is not to be used directly as a source but only by reference. Accreditation bodies applying it are to create their own reference material but to conform to the language and referencing and to not add any additional general requirements beyond the specific application of the accreditation. The National Voluntary Laboratory Accreditation Program (NVLAP) which I expect will be described elsewhere in this meeting, has a general handbook, Handbook 150, which incorporates ISO 17025 by reference and provides for the application specific requirements in supplemental Handbooks. For the Voting System Test Laboratory accreditation program, the supplement is Handbook 150-22. I had been working with the draft checklist for Handbook 150-22 which included some updates of EAC desired changes and used that draft along with a modified copy of the HB 150 checklist as a work copy and record sheet. In addition to the ISO 17025 based 150 checklist and the voting system application 150-22 draft checklist, I used a technical supplement checklist that listed the core requirement tests and procedures that the laboratories were expected to perform or have test method documentation. The technical checklist was extracted from the Voting System Standard (VSS-2002) and Voluntary Voting System Guidelines (VVSG-2005) sections. I did not have enough time from the point I received the contract and started the first review to create a new checklist document and validate so I used an outline matching the NVLAP checklists (and by reference, ISO 17025). Later, rather than going back and modifying the onsite record of my observations to fill in the outline with actual text from from the standards, I left the observation files as they were or just used the NVLAP checklists with a disclaimer to the labs that this was not sanctioned by NVLAP nor implied that any results were binding on NVLAP.

In a more formal review by an established accreditation body, the assessments are commonly done by two or more assessors, one administrative and one technical. In the EAC Interim Program, I was by myself and could not go through every item of the checklist in detail. The emphasis I made was to check that they had basic procedures required, that they could, where the terminology and organization was not matching the ISO 17025 language, identify and recognize where the particular requirement would be met, and that they had the appropriate

records and documents to show the procedure was beginning followed. Interviews with staff, after reviewing available training records, involved including specific requests that they show me where the procedures were for specific processes and reports and that they could access the standards and procedures required. The HB 150 and HB 150-22 checklists, especially for Clause 4, are heavily redundant and observations on one tended to qualify for the other.

For the actual testing against the VSS-2002 and HAVA requirements, we walked through a typical workflow sequence of the processes the laboratory was expected to follow using the Technical Supplement checklist and asked them to identify and show me test methods they used for each section of requirements in the Technical Supplement checklist. If they had voting systems on-site undergoing testing, I asked to witness or have demonstrated some particular tests, especially the Operational Status Check (VSS-2002, Vol II, Section 4.6.1.5).

Specific Clauses of ISO 17025.

ISO 17025 and the Handbook 150 and 150-22 identify requirements applying the laboratory in two main clauses:

Clause 4: Management Requirements.

These requirements cover:
4.1 Organization
4.2 Management system
4.3 Document control
4.4 Review of requests, tenders and contracts
4.5 Subcontracting of tests and calibrations
4.6 Purchasing services and supplies
4.7 Service to the customer
4.8 Complaints
4.9 Control of nonconforming testing and/or calibration work
4.10 Improvement
4.11 Corrective action
4.12 Preventive action
4.13 Control of records
4.14 Internal audits
4.15 Management reviews

Most of these are fairly straight forward in application, with the major application specific issue to recognize EAC authority and interest above and beyond the customer. 4.4 Review of requests, tenders and contracts introduced a problem of ‘test methods’ that I will discuss later. 4.5 Subcontracting of tests and calibrations involved a major issue with the roles of other labs which is discussed

in a later section. 4.6 Purchasing services and supplies is nearly not-applicable and was discussed but not heavily review.

Clause 5: Technical Requirements.

These requirements cover issues that may affect the reproducibility of test reports and the procedures for performing the tests. These requirements (and some of the sub areas of requirements of interest) are:

5.2 Personnel
5.3 Accommodation and environmental conditions
5.4 Test and calibration methods and method validation

- 5.4.2 Selection of methods
- 5.4.3 Laboratory-developed methods
- 5.4.4 Non-standard methods
- 5.4.5 Validation of methods
- ….

5.5 Equipment
5.6 Measurement traceability
5.7 Sampling
5.8 Handling of test and calibration items
5.9 Assuring the quality of test and calibration results
5.10 Reporting the results

- 5.10.5 Opinions and interpretations
- 5.10.6 Testing and calibration results obtained from subcontractors
- 5.10.8 Format of reports and certificates
- 5.10.9 Amendments to test reports and calibration certificates.

The major emphasis and time were on 5.2 Personnel, 5.4 Test and calibration methods and method validation, and 5.10 Reporting. Measurement traceability and sampling (5.6 and 5.7) are more appropriate to calibration labs and tended to not apply but there are some serious comparable issues such the traceability of requirements and sources of software.

5.2 Personnel centered on training and qualification of personnel assigned to the actual procedures and to determine how competency was determined before they were authorized to perform the specified test method.

5.4 Test and calibration methods and method validation was the most difficult of the sections because the laboratories were not use to the concept of ‘test method’ and documenting their procedures in terms of test methods. The NVLAP Handbook 150 defines (1.5.29) test methods as “Defined technical procedure to determine one or more specified characteristics of a material or product.” The key concept for us is that the test method is pre-defined and

validated to determine a specific requirement or set of requirements. The test method may be

a. (5.4.2) a specified method of testing against an international or national standard such as the test methods defined in the ISO standards for the ElectroMagnetic Compatibility,

b. (5.4.2) a modification of a standard test methods such as the environmental tests for non-operating environment, or

c. (5.4.3) a lab developed method such as a pre-defined set of test elections used to test for straight-party rules

d. (5.4.4) a non-standard method that has to be validated and documented.

I did not expect nor require that a test method had to be called a “test method” but just that the laboratory staff could identify and show me pre-defined documentation for performing the tests against the requirements and that the test method used was validated or, in the case of non-standard method, that the process for creating the method was documented and validated in such a way that it did not invalidate other methods under the VSS-2002/HAVA requirements.

5.10. The ISO 17025 requirements provide that the final test reports provide complete documentation to show what testing was performed and what results were found. In a addition to some minor quality requirements such ensuring that the pages are labeled so they can be identified if separated from the report, the ISO 17025 places a requirement for complete reporting and identifying what testing was performed (by ‘test method’) and sufficient details to allow the test to repeatable.

<u>Technical Supplement.</u>

In the later assessment reports, the Technical Supplement is identified as Clause 6 for additional requirements. It actually is the specific list of testing areas or services required under the VSS-2002 and HAVA which would be expected to have one or more test methods defined. If there was not a test method or procedure defined or the method which was defined did not cover known voting system requirements, the lab was expected to develop or identify a test method and make appropriate changes. Where the lab had clearly defined methods and some record of performance in developing or modifying such methods under their quality review program (such corrective actions, document control, and management reviews), no requirement was made to complete the method prior to accreditation approval. Otherwise, at least some of the more critical test methods are expected for review.

The Technical Supplement provided a list of core requirements which the lab was expected to test or otherwise evaluate. These specifically included both test methods and deliverable reports or results. Not every requirement was inspected due to limitation of time but the main areas and some major test methods sets under the areas which were highlighted were:

1. Technical Data Package Review:

….

b. Documents or manuals deliverable to the customer such as user and maintenance manuals.

….

f. Configuration Management Plan

….

h. Review of vendor tests (including validation of specific tests which were to be used in the certification testing).

….

(as a deliverable report under this area)

j. TDP Document Trace matrix directory.

k. Formal Test Plan.

2. Source code review

….

e. Review for security design concerns. (this included providing a small sample section of source code with known issues).

….

(as a deliverable report under this area).

g. Witnessed build from verified source code and COTS.

3. Physical Configuration Audit

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b. Accessibility standards.

c. Validation of the documents deliverable to the customer to the actual equipment performance.

d. Hardware transportation and storage tests.

e. EMC and electrical test suite.

.f Safety inspection

(as deliverables)

i. the test reports from sub-contracted labs for these tests).

4. Functional Configuration Audits

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b. Functional requirements fo Vol I, Sections 2 through 6.

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e. HAVA functional requirements.

(as deliverables)

f. A Requirement matrix showing which tests were performed and which requirements were satisified.

g. Report deficiencies encountered and their resolutions.

5. System Integration tests

a. Accuracy

b. Reliability
….
d. Security tests
….
f. Telecommunication
g. System end-to-end of the Election Management System, vote recording, vote tabulation, consolidation, and completing canvass reporting.

6. Qualification Test Report (listed required components).

Scope of Accreditation

A major issue in these assessments is the question of the scope of accreditation, the specific tests and services for which the lab receives accreditation. The position used for these assessments is based on expectation that the accredited lab has to provide a complete report. All requirements should be accountable under the report but the reporting lab does not have to perform those tests for which there is a current LAP under an ISO 17025 accrediting body. However, they need to include the other labs test result reports in the final report and they are responsible to ensure the reports are:

a. From a laboratory properly accredited for the test.
b. On models of the voting equipment that are being accredited
c. Operating the equipment as it would be used in an election.

Even for these test methods, the reporting lab may need to include a section on the test method that will provide instructions on the equipment operation script and reporting requirements to supplement the standard test method.

Known tests which fit under this exclusion include:

- Seven IEC 6100 series standards. Vol I, Section 3.2.2 specifies specific ranges and values to be applied for voting systems and Vol II, Section 4.8 specify the test standards with defined methods.
- Six Mil-Std 810D Methods for the non-operating environmental tests.

Less clear are standardized test methods which do not have ISO 17025 accreditation programs such as OSHA safety standards or some telecommunication standards which may have standard test methods but are not specified as required test methods within the VSS-2002/HAVA. For these, the reporting ITA will currently need to develop, define, and/or validate the methods to be used.