Voting System Standards/Guidelines

Section 222(e) of the Help America Vote Act of 2002 (HAVA) provides that the 2002 Voting System Standards adopted by the Federal Election Commission are deemed to be adopted by the Election Assistance Commission (EAC) as the first set of voluntary voting system guidelines adopted under HAVA.

HAVA establishes a Technical Guidelines Development Committee (TGDC), Chaired by the Director of the National Institute of Standards and Technology (NIST), to assist the EAC in the development of new or updated voluntary voting systems guidelines, and requires the TGDC to provide its first set of recommendations on these guidelines to the Executive Director of the EAC not later than nine months after all of its members have been appointed.

The Executive Director of the EAC is required to submit the guidelines proposed by the TGDC for adoption to:

- the EAC Board of Advisors; and
- the Executive Board of the EAC Standards Board, which is required to review the guidelines and forward its recommendations to the full Standards Board.

The Board of Advisors and the Standards Board are then required to review these guidelines and to submit comments and recommendations to the EAC.

The EAC is required to carry out the final adoption of the voluntary voting systems guidelines by providing for:

- A publication of notice of the proposed guidelines in the Federal Register;
- An opportunity for public comment on the proposed guidelines;
- An opportunity for a public hearing on the record; and
- A publication of the final guidelines in the Federal Register.

The EAC may not vote on the final adoption of a guideline until the expiration of the 90-day period that begins on the date the proposed guidelines are submitted to the Board of Advisors and the Standards Board. A majority vote (3 of the 4 Commissioners) is required to adopt a voluntary voting systems guideline. A voluntary voting systems guideline is not considered to be finally adopted by the EAC unless the EAC votes to approve the final adoption taking into consideration the comments and recommendations submitted by the Board of Advisors and the Standards Board.

Documents labeled [Word] are provided in Microsoft Word file format; Microsoft Word is available from Microsoft.

2002 Voting Systems Standards
(as developed by the Federal Election Commission):

- Overview [Word]
- Volume I, Performance Standards

http://www.eac.gov/election_resources/vss.html

Exhibit 17

4/15/2006
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Hardware Standards

3.1 Scope

This section contains the requirements for the machines and manufactured devices that are part of a voting system. It specifies minimum values for certain performance characteristics; physical characteristics; and design, construction, and maintenance characteristics for the hardware and selected related components of all voting systems, such as:

- Ballot printers;
- Ballot cards and sheets;
- Ballot displays;
- Voting devices, including punching and marking devices and DRE recording devices;
- Voting booths and enclosures;
- Ballot boxes and ballot transfer boxes;
- Ballot readers;
- Computers used to prepare ballots, program elections, consolidate and report votes, and perform other elections management activities;
- Electronic ballot recorders;
- Electronic precinct vote control units;
- Removable electronic data storage media;
- Servers; and
- Printers.

This section applies to the combination of software and hardware to accomplish specific performance and system control requirements. Standards that are specific to software alone are provided in Section 4 of the Standards.
3.1.1 Hardware Sources

The requirements of this section apply generally to all hardware used in voting systems, including:

a. Hardware provided by the voting system vendor and its suppliers;

b. Hardware furnished by an external provider (for example, providers of commercial off-the-shelf (COTS) machines and devices) where the hardware may be used in any way during voting system operation; and

c. Hardware provided by the voting jurisdiction.

3.1.2 Organization of this Section

The standards presented in this section are organized as follows:

- **Performance Requirements**: These requirements address the combined operational capabilities of the voting system’s hardware and software across a broad range of parameters;

- **Physical Requirements**: These requirements address the size, weight and transportability of the voting system; and

- **Design, Construction, and Maintenance Requirements**: These requirements address the reliability and durability of materials, product marking, quality of system workmanship, safety, and other attributes to ensure smooth system operation in the voting environment.

3.2 Performance Requirements

The performance requirements address a broad range of parameters, encompassing:

a. Accuracy requirements, where requirements are specified for distinct processing functions of paper-based and DRE systems;

b. Environmental requirements, where no distinction is made between requirements for paper-based and DRE systems, but requirements for precinct and central count are described;

c. Vote data management requirements, where no differentiation is made between requirements for paper-based and DRE systems;
d. Vote recording requirements, where separate and distinct requirements are delineated for paper-based and DRE systems;

e. Conversion requirements, which apply only to paper-based systems;

f. Processing requirements, where separate and distinct requirements are delineated for paper-based and DRE systems; and

g. Reporting requirements, where no distinction is made between requirements for paper-based and DRE systems, but where differences between precinct and central count systems are readily apparent based on differences of their reporting.

The performance requirements include such attributes as ballot reading and handling requirements; system accuracy; memory stability; and the ability to withstand specified environmental conditions. These characteristics also encompass system-wide requirements for shelter, electrical supply, and compatibility with data networks.

Performance requirements for voting systems represent the combined operational capability of both system hardware and software. Accuracy, as measured by data error rate, and operational failure are treated as distinct attributes in performance testing. All systems shall meet the performance requirements under operating conditions and after storage under non-operating conditions.

3.2.1 Accuracy Requirements

Voting system accuracy addresses the accuracy of data for each of the individual ballot positions that could be selected by a voter, including the positions that are not selected. For a voting system, accuracy is defined as the ability of the system to capture, record, store, consolidate and report the specific selections and absence of selections, made by the voter for each ballot position without error. Required accuracy is defined in terms of an error rate that for testing purposes represents the maximum number of errors allowed while processing a specified volume of data. This rate is set at a sufficiently stringent level such that the likelihood of voting system errors affecting the outcome of an election is exceptionally remote even in the closest of elections.

The error rate is defined using a convention that recognizes differences in how vote data is processed by different types of voting systems. Paper-based and DRE systems have different processing steps. Some differences also exist between precinct count and central count systems. Therefore, the acceptable error rate applies separately and distinctly to each of the following functions:

a. For all paper-based systems:

1) Scanning ballot positions on paper ballots to detect selections for individual candidates and contests;
2) Conversion of selections detected on paper ballots into digital data;

b. For all DRE systems:

1) Recording the voter selections of candidates and contests into voting data storage; and

2) Independently from voting data storage, recording voter selections of candidates and contests into ballot image storage.

c. For precinct-count systems (paper-based and DRE):

Consolidation of vote selection data from multiple precinct-based systems to generate jurisdiction-wide vote counts, including storage and reporting of the consolidated vote data; and

d. For central-count systems (paper-based and DRE):

Consolidation of vote selection data from multiple counting devices to generate jurisdiction-wide vote counts, including storage and reporting of the consolidated vote data.

For testing purposes, the acceptable error rate is defined using two parameters: the desired error rate to be achieved, and the maximum error rate that should be accepted by the test process.

For each processing function indicated above, the system shall achieve a target error rate of no more than one in 10,000,000 ballot positions, with a maximum acceptable error rate in the test process of one in 500,000 ballot positions.

3.2.2 Environmental Requirements

The environmental requirements for voting systems include shelter, space, furnishings and fixtures, supplied energy, environmental control, and external telecommunications services. Environmental conditions applicable to the design and operation of voting systems consist of the following categories:

- Natural environment, including temperature, humidity, and atmospheric pressure;
- Induced environment, including proper and improper operation and handling of the system and its components during the election processes;
- Transportation and storage; and
- Electromagnetic signal environment, including exposure to and generation of radio frequency energy.

All voting systems shall be designed to withstand the environmental conditions contained in the appropriate test procedures of the Standards. These procedures will