

Volume I, Section 1

Table of Contents

1	Introduction	1-1
1.1	Objectives and Usage of the Voting System Standards	1-1
1.2	Development History for Initial Standards	1-2
1.3	Update of the Standards	1-3
1.4	Accessibility for Individuals with Disabilities	1-3
1.5	Definitions	1-4
1.5.1	Voting System.....	1-4
1.5.2	Paper-Based Voting System.....	1-5
1.5.3	Direct Record Electronic (DRE) Voting System	1-5
1.5.4	Public Network Direct Record Electronic (DRE) Voting System	1-6
1.5.5	Precinct Count Voting System	1-6
1.5.6	Central Count Voting System	1-6
1.6	Application of the Standards and Test Specifications	1-7
1.6.1	Qualification Tests	1-8
1.6.2	Certification Tests	1-9
1.6.3	Acceptance Tests	1-10
1.7	Conformance Clause	1-11
1.7.1	Scope and Applicability.....	1-11
1.7.2	Conformance Framework	1-12
1.7.2.1	Applicable entities	1-12
1.7.2.2	Relationship among entities	1-13
1.7.2.3	Conformance designations.....	1-14
1.7.3	Normative Language	1-15
1.7.4	Categorizing Requirements	1-15
1.7.5	Extensions	1-16
1.7.6	Implementation Statement.....	1-16
1.8	Outline of Contents	1-17

1

Introduction

1.1 Objectives and Usage of the Voting System Standards

State and local officials today are confronted with increasingly complex voting system technology and an increased risk of voting system failure. Responding to calls for assistance from the states, the United States Congress authorized the Federal Election Commission (FEC) to develop voluntary national voting systems standards for computer-based systems. The resulting FEC Voting System Standards (“the Standards”) seek to aid state and local election officials in ensuring that new voting systems are designed to function accurately and reliably, thus ensuring the system’s integrity. States are free to adopt the Standards in whole or in part. States may also choose to enact stricter performance requirements for systems used in their jurisdictions.

The Standards specify minimum functional requirements, performance characteristics, documentation requirements, and test evaluation criteria. For the most part, the Standards address what a voting system should reliably do, not how system components should be configured to meet these requirements. It is not the intent of the Standards to impede the design and development of new, innovative equipment by vendors. Furthermore, the Standards balance risk and cost by requiring voting systems to have essential, but not excessive, capabilities.

The Standards are not intended to define appropriate election administration practices. However, the total integrity of the election process can only be ensured if implementation of the Standards is coupled with effective election administration practices.

The Standards are intended for use by multiple audiences to support their respective roles in the development, testing, and acquisition of voting systems:

- ◆ Authorities responsible for the analysis and testing of such systems in support of qualification and/or certification of systems for purchase within a designated jurisdiction;
- ◆ State and local agencies evaluating voting systems to be procured within their jurisdictions; and

- ◆ Designers and manufacturers of voting systems.

1.2 Development History for Initial Standards

Much of the groundwork for the Standards' development was laid by a national study conducted in 1975 by the National Bureau of Standards, now known as the National Institute of Standards and Technology (NIST). This study was requested by the FEC's Office of Election Administrator's predecessor, the Office of Federal Elections of the General Accounting Office. The report, "*Effective Use of Computing Technology in Vote-Tallying*," made a number of recommendations bearing directly on the Standards project. After analyzing computer-related election problems encountered in the past, the report concluded that one of the basic causes for these difficulties was the lack of appropriate technical skill at the state and local level for developing or implementing sophisticated and complex standards against which voting system hardware and software could be tested.

Following the release of this report, Congress mandated that the FEC, with the cooperation and assistance of the National Bureau of Standards, study and report on the feasibility of developing "voluntary engineering and procedural performance standards for voting systems used in the United States." (2 U.S.C. §431 Note) The resulting 1983 study cited a substantial number of technical and managerial problems that affected the integrity of the vote counting process. It also asserted the need for a federal agency to develop national performance standards that could be used as a tool by state and local election officials in the testing, certification, and procurement of computer-based voting systems. In 1984, Congress approved initial funding for the Standards.

The FEC held a series of public hearings in developing the initial Standards. State and local election officials, election system vendors, technical consultants, and others reviewed drafts of the proposed criteria. The FEC considered their many comments and made appropriate revisions. Before final issuance, the FEC publicly announced the availability of the latest draft of the Standards in the Federal Register and requested that all interested parties submit final comments. The FEC meticulously reviewed all responses to the notice and incorporated corrections and suitable suggestions. Ultimately, the final product was the result of considerable deliberation, close consultation with election officials, and careful consideration of comments from all interested parties.

In January 1990, the FEC issued the performance standards and testing procedures for punchcard, marksense, and direct recording electronic (DRE) voting systems. The Standards did not cover paper ballot and mechanical lever systems because paper ballots are sufficiently self-explanatory not to require technical standards and mechanical lever systems are no longer manufactured or sold in the United States. The FEC also did not incorporate requirements for mainframe computer hardware because it was reasonable to assume that sufficient engineering and performance criteria

already governed the operation of mainframe computers. However, vote tally software installed on mainframes is covered by the Standards.

1.3 Update of the Standards

Today, over two-thirds of the States have adopted the Standards in whole or in part. As a result, the voting systems marketed today are dramatically improved. Election officials are better assured that the voting systems they procure will work accurately and reliably. Voting system failures are declining and now primarily involve pre-Standard equipment, untested equipment configurations, or the mismanagement of tested equipment. Overall, systems integrity and the election processes have improved markedly.

However, advances in voting technology, legislative changes, and the proliferation of electronic voting systems make an update of the Standards necessary. The industry has been marked by widespread integration of personal computer technology and non-mainframe servers into DRE voting systems.

In addition, voting systems need to be responsive to the Americans with Disabilities Act (ADA) of 1990 and guidelines developed to assist in implementing the ADA.

1.4 Accessibility for Individuals with Disabilities

Voters and election officials who use voting systems represent a broad spectrum of the population, and include individuals with disabilities who may have difficulty using traditional voting systems. In developing accessibility provisions for the Standards, the FEC requested assistance from the Access Board, the federal agency in the forefront of promulgating accessibility provisions. The Access Board submitted technical standards designed to meet the diverse needs of voters with a broad range of disabilities. The FEC has adopted the entirety of the Access Board's recommendations and incorporated them into the Standards. These recommendations comprise the bulk of the accessibility provisions found in Section 2.2.7. Implementing these provisions, however, will not entirely eliminate the need to accommodate the needs of some disabled voters by human interface.

The FEC anticipates that during the lifetime of this version of the Standards increased obligations will be placed upon election officials at every jurisdictional level to provide voting equipment tailored to meet the needs of voters with disabilities. To facilitate jurisdictions in meeting accessibility needs, the Standards mandate that every voting system incorporate some accessible voting capabilities. The Standards also mandate that systems incorporating a DRE component meet specific technological requirements. To do so, it is anticipated that a vendor will have to either configure all

of the system's voting stations to meet the accessibility specifications or will have to design a unique station that conforms to the accessibility requirements and is part of the overall voting system configuration.

Under no circumstances should compliance with requirements for accessibility be viewed as mutually exclusive from compliance with any other provision of the Standards. If a voting system contains a machine uniquely designed to meet the accessibility requirements, such a machine will be tested for compliance with the accessibility requirements, as well as for compliance with all of the DRE standards, in order to ensure that an accessible machine does not unintentionally abrogate the mandates of the Standards.

1.5 Definitions

The Standards contain terms describing function, design, documentation, and testing attributes of equipment and computer programs. Unless otherwise specified, the intended sense of technical terms is that which is commonly used by the information technology industry. In some cases terminology is specific to elections or voting systems, and a glossary of those terms is contained in Appendix A. Nontechnical terms not listed in Appendix A shall be interpreted according to their standard dictionary definitions.

Additionally, the following terms are defined below:

- ◆ Voting system;
- ◆ Paper-based voting system;
- ◆ Direct record electronic (DRE) voting system;
- ◆ Public network direct record electronic (DRE) voting system;
- ◆ Precinct count voting system; and
- ◆ Central count voting system.

1.5.1 Voting System

A voting system is a combination of mechanical, electromechanical, or electronic equipment. It includes the software required to program, control, and support the equipment that is used to define ballots; to cast and count votes; to report and/or display election results; and to maintain and produce all audit trail information. A voting system may also include the transmission of results over telecommunication networks.

Additionally, a voting system includes the associated documentation used to operate the system, maintain the system, identify system components and their versions, test the system during its development and maintenance, maintain records of system errors and defects, and determine specific changes made after system qualification. By definition, this includes all documentation required in Section 9.4.

Traditionally, a voting system has been defined by the mechanism the system uses to cast votes and further categorized by the location where the system tabulates ballots. However, the Standards recognize that as the industry develops unique solutions to various challenges and as voting systems become more responsive to the needs of election officials and voters, the rigid dichotomies between voting system types may be blurred. Innovations that use a fluid understanding of system types can greatly improve the voting system industry, but only if controls are in place to monitor and control integrity through the proper evaluation of the system brought for qualification.

As such, vendors that submit a system that integrates components from more than one traditional system type or a system that includes components not addressed in this Standard shall submit the results of all beta tests of the new system. Vendors also shall submit a proposed test plan to the appropriate independent test authority recognized by the National Association of State Election Directors (NASSED) to conduct national qualification testing of voting systems. The Standards permit vendors to produce or utilize interoperable components of a voting system that are tested within the full voting system configuration.

1.5.2 Paper-Based Voting System

A Paper-Based Voting System, (referred to in the initial Standards as a Punchcard and Marksense [P&M] Voting System) records votes, counts votes, and produces a tabulation of the vote count from votes cast on paper cards or sheets. A punchcard voting system allows a voter to record votes by means of holes punched in designated voting response locations. A marksense voting system allows a voter to record votes by means of marks made by the voter directly on the ballot, usually in voting response locations. Additionally, a paper based system may record votes using other approaches whereby the voter's selections are indicated by marks made on a paper ballot by an electronic input device, as long as such an input device does not independently record, store, or tabulate the voters selections.

1.5.3 Direct Record Electronic (DRE) Voting System

A Direct Record Electronic (DRE) Voting System records votes by means of a ballot display provided with mechanical or electro-optical components that can be activated by the voter; that processes data by means of a computer program; and that records

voting data and ballot images in memory components. It produces a tabulation of the voting data stored in a removable memory component and as printed copy. The system may also provide a means for transmitting individual ballots or vote totals to a central location for consolidating and reporting results from precincts at the central location.

1.5.4 Public Network Direct Record Electronic (DRE) Voting System

A Public Network Direct Record Electronic (DRE) Voting System is an election system that uses electronic ballots and transmits vote data from the polling place to another location over a public network as defined in Section 5.1.2. Vote data may be transmitted as individual ballots as they are cast, periodically as batches of ballots throughout the Election Day, or as one batch at the close of voting. For purposes of the Standards, Public Network DRE Voting Systems are considered a form of DRE Voting System and are subject to the standards applicable to DRE Voting Systems. However, because transmitting vote data over public networks relies on equipment beyond the control of the election authority, the system is subject to additional threats to system integrity and availability. Therefore, additional requirements discussed in Section 5 and 6 apply.

The use of public networks for transmitting vote data must provide the same level of integrity as other forms of voting systems, and must be accomplished in a manner that precludes three risks to the election process: automated casting of fraudulent votes, automated manipulation of vote counts, and disruption of the voting process such that the system is unavailable to voters during the time period authorized for system use.

1.5.5 Precinct Count Voting System

A Precinct Count Voting System is a voting system that tabulates ballots at the polling place. These systems typically tabulate ballots as they are cast and print the results after the close of polling. For DREs, and for some paper-based systems, these systems provide electronic storage of the vote count and may transmit results to a central location over public telecommunication networks.

1.5.6 Central Count Voting System

A Central Count Voting System is a voting system that tabulates ballots from multiple precincts at a central location. Voted ballots are typically placed into secure storage at

the polling place. Stored ballots are transported or transmitted to a central counting place. The systems produce a printed report of the vote count, and may produce a report stored on electronic media.

1.6 Application of the Standards and Test Specifications

The Standards apply to all system hardware, software, telecommunications, and documentation intended for use to:

- ◆ Prepare the voting system for use in an election;
- ◆ Produce the appropriate ballot formats;
- ◆ Test that the voting system and ballot materials have been properly prepared and are ready for use;
- ◆ Record and count votes;
- ◆ Consolidate and report results;
- ◆ Display results on-site or remotely; and
- ◆ Maintain and produce all audit trail information.

In general, the Standards define functional requirements and performance characteristics that can be assessed by a series of defined tests. Standards are mandatory requirements and are designated by use of the term “shall.”

Some voting systems use one or more readily available commercial off-the-shelf (COTS) devices (such as card readers, printers, or personal computers) or software products (such as operating systems, programming language compilers, or database management systems). COTS devices and software are exempted from certain portions of the qualification testing process as defined herein, as long as such products are not modified for use in a voting system.

Generally, voting systems are subject to the following three testing phases prior to being purchased or leased:

- ◆ Qualification tests;
- ◆ State certification tests; and
- ◆ State and/or local acceptance tests.

1.6.1 Qualification Tests

Qualification tests validate that a voting system meets the requirements of the Standards and performs according to the vendor's specifications for the system. Such tests encompass the examination of software; the inspection and evaluation of system documentation; tests of hardware under conditions simulating the intended storage, operation, transportation, and maintenance environments; operational tests to validate system performance and function under normal and abnormal conditions; and examination of the vendor's system development, testing, quality assurance, and configuration management practices. Qualification tests address individual system components or elements, as well as the integrated system as a whole.

Since 1994, qualification tests for voting systems have been performed by Independent Test Authorities (ITAs) certified by the National Association of State Election Directors (NASSED). NASSED has certified an ITA for either the full scope of qualification testing or a distinct subset of the total scope of testing. To date, ITAs have been certified only for distinct subsets of testing. Upon the successful completion of testing by an ITA, the ITA issues a Qualification Test Report to the vendor and NASSED. The qualification test report remains valid for as long as the voting system remains unchanged.

Upon receipt of test reports that address the full scope of testing, NASSED issues a Qualification Number that indicates the system has been tested by certified ITAs for compliance with the Standards and qualifies for the certification process of states that have adopted the Standards. The Qualification Number applies to the system as a whole, and does not apply to individual system components or untested configurations.

After a system has completed qualification testing, further examination of a system is required if modifications are made to hardware, software, or telecommunications, including the installation of software on different hardware. Vendors request review of modifications by the appropriate ITA based on the nature and scope of changes made and the scope of the ITA's role in NASSED qualification. The ITA will determine the extent to which the modified system should be resubmitted for qualification testing and the extent of testing to be conducted.

Generally, a voting system remains qualified under the standards against which it was tested, as long as no modifications not approved by an ITA are made to the system. However, if a new threat to a particular voting system is discovered, it is the prerogative of NASSED to determine which qualified voting systems are vulnerable, whether those systems need to be retested, and the specific tests to be conducted. In addition, when new standards supersede the standards under which the system was qualified, it is the prerogative of NASSED to determine when systems that were qualified under the earlier standards will lose their qualification, unless they are tested to meet current standards.

Among other things, qualification testing complements and evaluates the vendor's developmental testing and beta testing. The ITA is expected to evaluate the completeness of the vendor's developmental test program, including the sufficiency of vendor tests conducted to demonstrate compliance with the Standards as well as the system's performance specifications. The ITA undertakes sample testing of the vendor's test modules and also designs independent system-level tests to supplement and check those designed by the vendor. Although some of the qualification tests are based on those prescribed in the Military Standards, in most cases the test conditions are less stringent, reflecting commercial, rather than military, practice.

1.6.2 Certification Tests

Certification tests are performed by individual states, with or without the assistance of outside consultants, to:

- ◆ Confirm that the voting system presented is the same as the one qualified through the Standards;
- ◆ Test for the proper implementation of state-specific requirements;
- ◆ Establish a baseline for future evaluations or tests of the system, such as acceptance testing or state review after modifications have been made; and
- ◆ Define acceptance tests.

Precise certification test scripts are not included in the Standards, as they must be defined by the state, with its laws, election practices, and needs in mind. However, it is recommended that they not duplicate qualification tests, but instead focus on functional tests and qualitative assessment to ensure that the system operates in a manner that is acceptable under state law. If a voting system is modified after state certification, it is recommended that States reevaluate the system to determine if further certification testing is warranted.

Certification tests performed by individual states typically rely on information contained in documentation provided by the vendor for system design, installation, operations, required facilities and supplies, personnel support and other aspects of the voting system. States and jurisdictions may define information and documentation requirements additional to those defined in the Standards. By design, the Standards, and qualification testing of voting systems for compliance with the Standards, do not address these additional requirements. However, qualification testing addresses all capabilities of a voting system stated by the vendor in the system documentation submitted to an ITA, including additional capabilities that are not required by the Standards.

1.6.3 Acceptance Tests

Acceptance tests are performed at the state or local jurisdiction level upon system delivery by the vendor to:

- ◆ Confirm that the system delivered is the specific system qualified by NASED and, when applicable, certified by the state;
- ◆ Evaluate the degree to which delivered units conform to both the system characteristics specified in the procurement documentation, and those demonstrated in the qualification and certification tests; and
- ◆ Establish a baseline for any future required audits of the system.

Some of the operational tests conducted during qualification may be repeated during acceptance testing.

1 **1.7 Conformance Clause**

2 **1.7.1 Scope and Applicability**

3 The Voluntary Voting System Guidelines (VVSG) define requirements for
4 conformance of voting systems. Conformance is defined in terms of requirements that
5 voting system vendors claiming conformance to these Guidelines shall meet. The
6 VVSG also provides the framework, procedures, and requirements that testing
7 authorities responsible for the qualification of voting systems shall follow in order to
8 qualify a voting system for EAC certification. The requirements and procedures in
9 the VVSG may also be used by States to certify voting systems. To ensure that correct
10 voting system software has been distributed without modification, the VVSG includes
11 requirements for a national software repository. Finally, the VVSG provides guidance
12 in the form of best practices to voting officials. These best practices are not mandated
13 and are not subject to testing by testing authorities to qualify voting systems. They
14 are provided as adjuncts to the technical requirements for voting systems in order to
15 ensure the integrity of the voting process and to assist States in properly setting up,
16 deploying, and operating voting systems.

17 The Voluntary Voting System Guidelines define the minimum requirements for
18 voting systems and the process of testing voting systems. The guidelines are intended
19 for use by:

20

- 21 1. Designers and manufacturers of voting systems,
- 22 2. Testing authorities responsible for the analysis and testing of voting systems
23 in support of qualification of systems for purchase within a designated
24 jurisdiction,
- 25 3. National software repositories, either maintained by the National Institute of
26 Standard and Technology (NIST) or other EAC designated repository,
- 27 4. (Optionally) Voting officials, including election judges, poll workers, ballot
28 designers and officials responsible for the installation, operation, and
29 maintenance of voting machines, and
- 30 5. (Optionally) testing authorities responsible for the State certification of
31 voting systems.

32

33 Minimum requirements specified in these guidelines include:

34

- 35 ● Functional requirements,
- 36 ● Performance characteristics,
- 37 ● Documentation requirements,
- 38 ● Test evaluation criteria, and
- 39 ● Procedural requirements.

1 1.7.2 Conformance Framework

2 This section provides the framework in which conformance is defined. It identifies
3 the entities for which these guidelines apply, the relationship among the various
4 entities and these guidelines, structure of requirements, and the terminology used to
5 indicate conformance.

6

7 1.7.2.1 Applicable entities

8 The requirements, prohibitions, options, and guidance specified in these guidelines
9 apply to voting systems, voting system vendors, testing authorities, and repositories.

10

11 In general, requirements for designers and manufacturers of voting systems in these
12 guidelines apply to all voting systems, unless prefaced with explanatory narrative
13 describing unique applicability. Other terms in these guidelines shall be construed as
14 synonymous with “all voting systems.” They are:

15

- 16 • “all systems,”
- 17 • “systems,”
- 18 • “the system,”
- 19 • “the voting system,” and
- 20 • “each voting system.”

21

22 The term “voting system vendor” imposes documentation or testing requirements on
23 voting systems, via the manufacturer or vendor. Other terms in these guidelines shall
24 be construed as synonymous with “voting system vendor. They are:

25

- 26 • “vendors,”
- 27 • “the vendor,”
- 28 • “manufacturer or vendor,”
- 29 • “voting system designers,” and
- 30 • “implementer.”

31

32 The terms used to designate requirements and procedural guidelines for testing
33 authorities are indicated by referring to Independent Testing Authority (ITA) and
34 EAC accredited testing authority. Under HAVA, ITAs have been replaced by EAC
35 accredited testing authorities. In these guidelines, EAC accredited testing authority
36 and ITA shall be considered equivalent. In addition, the National Association of State

1 Election Directors (NASED) activities specified in these guidelines shall be performed
2 by the Election Assistance Commission (EAC).

3 The term “repository” will be used to designate requirements levied on the national
4 software repository maintained at NIST or any other EAC designated repository. The
5 repository maintained at NIST is called the National Software Reference Library
6 (NSRL).

7 Guidance and best practices for voting officials are indicated by the notation “*Best*
8 *Practices for Voting Officials*” preceding the best practice statement.

9 1.7.2.2 Relationship among entities

10 Although conformance is defined for voting systems, it is the voting system vendor
11 that needs to implement these requirements and provide the necessary documentation
12 with the system. In order to claim conformance to the Voluntary Voting Systems
13 Guidelines, the voting system vendor shall satisfy the minimum requirements
14 specified in the VVSG, including implementation of functionality, prescribed software
15 coding and assurance practices, and preparation of the Technical Data Package (TDP).
16 In order to claim that a voting system is qualified, the voting system vendor shall
17 satisfy the requirements for qualification testing and successfully complete the test
18 campaign with an ITA/testing authority.

19

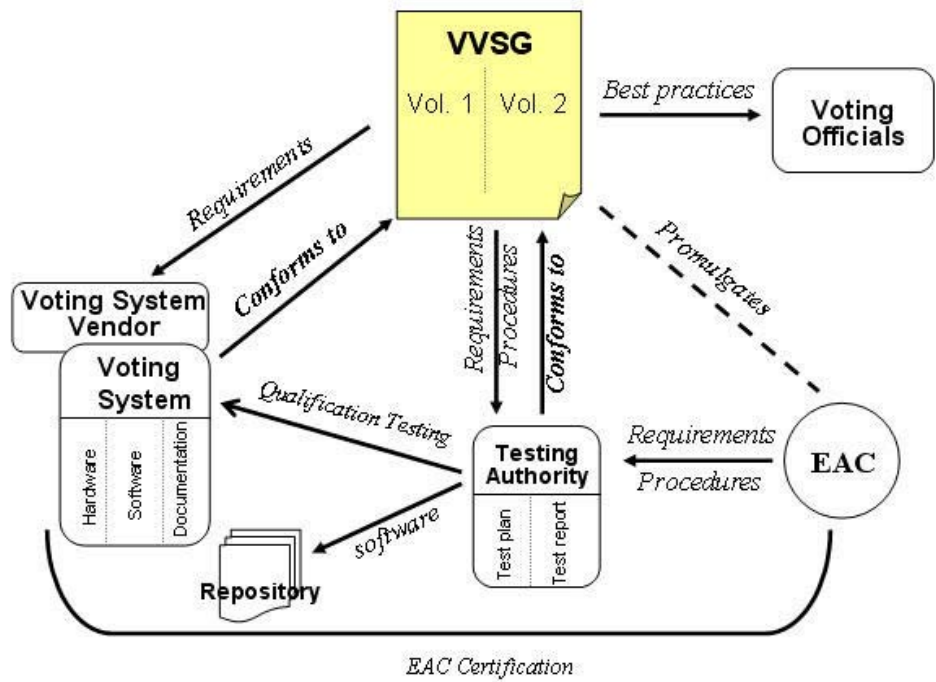
20 An ITA/EAC accredited test authority shall satisfy the requirements for conducting
21 qualification testing. The ITA/EAC accredited test authority may use an operational
22 environment that is derived from the VVSG best practice guidelines for voting
23 officials as part of their testing to ensure that the voting system can be configured and
24 operated in a secure and reliable manner according to the voting system vendor’s
25 documentation and as specified by the VVSG. Additionally, the ITA/EAC accredited
26 test authority shall coordinate and deliver the requisite documentation to the EAC and
27 copies of voting system software to the repository. Note that in the VVSG, these
28 requirements and the relationship between the ITA/EAC accredited test authority and
29 the certification authority is with NASED, not the EAC.

30 The EAC is assuming the responsibility for certification of voting systems from
31 NASED.

32 The VVSG provides guidance denoted as “Best Practices for Voting Officials.” This
33 guidance may be used to allow jurisdictions to incorporate appropriate procedures to
34 help ensure that their voting systems are reliable, accessible, usable, and secure.
35 Furthermore, this guidance may be used in training and incorporated into written
36 procedures for properly conducting the election and operating voting systems.

37

38 Figure 1 provides an illustration of these relationships.



1
2 Figure 1 Relationship between entities

3

4 1.7.2.3 Structure of requirements

5 Sections of this document that augment the VSS-2002, by either replacing VSS-2002
6 sections or adding new sections, are indicated by line numbers, footer information
7 (i.e., New Material, date, etc.) at the bottom of pages with new material, and
8 hierarchically structured requirements. Each requirement is numbered according to a
9 hierarchical scheme in which higher-level requirements (such as “provide accessibility
10 for blind voters”) are supported by lower-level requirements (“provide an audio-tactile
11 interface”). Thus, requirements are contained (i.e., nested) within other requirements.
12 A nested requirement or lower-level requirement is a ‘child’ to its ‘parent’ or higher-
13 level requirement.

14 Some of these requirements are directly testable and some are not. The latter tend to
15 be higher-level and are included because 1) they are testable indirectly insofar as their
16 lower-level, children requirements are testable, and 2) they often provide the structure
17 and rationale for the lower-level requirements. Satisfying the lower-level requirement
18 will result in satisfying its higher-level ‘parent’ requirement.

19 1.7.2.4 Conformance designations

20 A voting system conforms if all the mandatory requirements that apply to the voting
21 system are fulfilled. An implementation statement (see Section 1.7.6) or similar

1 mechanism is used to describe the capabilities, features and optional functions that
2 have been implemented and are subject to conformance and qualification testing.
3 There is no concept of partial conformance, e.g., a voting system is 80% conforming.

4

5 1.7.3 Normative Language

6 The following keywords are used to convey conformance requirements.

- 7 • **Shall** – to indicate a mandatory requirement to be followed (implemented) in
8 order to conform. Synonymous with “is required to.”
- 9 • **Is prohibited** – to indicate a mandatory requirement that indicates something
10 that is not permitted (allowed), in order to conform. Synonymous with “shall
11 not.”
- 12 • **Should, Is encouraged** - to indicate an optional recommended action, one
13 that is particularly suitable, without mentioning or excluding others.
14 Synonymous with “is permitted and recommended.”
- 15 • **May** - to indicate an optional, permissible action. Synonymous with “is
16 permitted.”

17

18 Normative text is directly applicable to achieving conformance to this document.
19 Informative parts of this document include examples, extended explanations, and
20 other matter that contain information necessary for proper understanding of the VVSG
21 and conformance to it. Some sections in the VSSG have narrative text prefixed by the
22 keywords: *Discussion* or *Best Practices for Voting Officials*. This text is informative
23 and has no bearing on conformance.

24

25 1.7.4 Categorizing Requirements

26 In addition to defining a common set of requirements that apply to all voting systems,
27 the VVSG categorizes some requirements into related groups of functionality to
28 address equipment type, ballot tabulation location, and voting system component
29 (e.g., election management system). Hence, not all requirements apply to all voting
30 systems. Specifically, if a category is not applicable to a voting system, then the
31 requirements in that category are not applicable. For example, requirements
32 categorized as “DRE Systems” (as in Volume I, Section 2.4.9) are not applicable to
33 paper-based voting systems and thus are ignored by paper-based systems.

34

35 Among the categories defined in the VVSG are two types of voting systems with
36 respect to mechanisms to cast votes – Paper-Based Voting Systems and Direct Record
37 Electronic (DRE) Voting Systems. Additionally, voting systems are further

1 categorized, in these guidelines, by the locations where ballots are tabulated – Precinct
2 Count Voting Systems, which tabulate ballots at the polling place, and Central Count
3 Voting Systems, which tabulate ballots from multiple precincts at a central location.
4 The VVSG defines specific requirements for systems that fall within these four
5 categories as well as various combinations of these categories.

6

7 Other categories for which requirements are defined include: election management
8 systems (EMS), methods of independent verification, and telecommunication
9 components.

10 1.7.5 Extensions

11 Extensions are additional functions, features, and/or capabilities included in a voting
12 system that are not required by the VVSG. To accommodate the needs of States that
13 may impose additional requirements beyond those listed in these guidelines and to
14 accommodate changes in technology, these guidelines allow extensions. Thus, a
15 voting system may include extensions and still be conformant to the VVSG. The use
16 of extensions shall not contradict nor cause the nonconformance of functionality
17 defined in the VVSG.

18 1.7.6 Implementation Statement

19

20 An implementation statement provides information about a voting system, by
21 documenting the requirements that have been implemented by the voting system. It
22 can also be used to highlight optional features and capabilities supported by the voting
23 system, as well as to document any extensions (i.e., additional functionality beyond
24 what is required in the standard). An implementation statement may take the form of
25 a checklist, to be completed for each voting system for which a claim of conformance
26 to the VVSG or subset of the VVSG is desired.

27

28 An implementation statement provides a concise summary and a quick overview of
29 requirements that have been implemented. The implementation statement may also be
30 used to identify the subset of a test suite that would be applicable to the voting system
31 being tested.

32

33 If an implementation statement is provided, it shall include identifying information
34 about the voting system, including at a minimum versioning and date information.
35 Additionally, a narrative description of the voting system shall be included in the
36 implementation statement.

1

2 **1.8 Outline of Contents**

3 The organization of the Standards has been simplified to facilitate its use. *Volume I,*
4 *Voting System Performance Standards,* is intended for use by the broadest audience,
5 including voting system developers, equipment manufacturers and suppliers,
6 independent test authorities, local agencies that purchase and deploy voting systems,
7 state organizations that certify a system prior to procurement by a local jurisdiction,
8 and public interest organizations that have an interest in voting systems and voting
9 systems standards.

- 10 ◆ Section 2 describes the functional capabilities required of voting systems.
- 11 ◆ Sections 3 through 6 describe specific performance standards for election
12 system hardware, software, telecommunications and security, respectively.
- 13 ◆ Sections 7 and 8 describe practices for quality assurance and configuration
14 management, respectively, to be used by vendors, and required information
15 about vendor practices that will be reviewed in concert with system
16 qualification and certification test processes and system purchase decisions.
- 17 ◆ Section 9 provides an overview of the test and measurement process used by
18 test authorities for qualification and re-qualification of voting systems.
- 19 ◆ Appendix A provides a glossary of important terms used in Volume I.
- 20 ◆ Appendix B lists the publications that were used for guidance in the
21 preparation of the Standards. These publications contain information that is
22 useful in interpreting and complying with the requirements of the Standards.
- 23 ◆ Appendix C addresses issues of usability of voting systems, commonly
24 referred to as “human factors.” This appendix does not represent mandates
25 that voting systems will be tested against, but rather contain recommendations
26 and best practices on usability issues designed to provide vendors and election
27 officials with guidance on designing and procuring systems that are easy and
28 intuitive to use by voters.

29 *Volume II, Voting System Qualification Testing Standards* describes the standards for
30 the technical information submitted by the vendor to support testing; the development
31 of test plans by the ITA for initial system testing and testing of system modifications;
32 the conduct of system qualification tests by the ITA; and the test reports generated by
33 the ITA. This volume complements the content of Volume I and is intended primarily
34 for use by ITAs, state organizations that certify a system, and vendors.