



Voting System Standards

[FEC HOME](#) > [AGENDAS](#) > [12/13/2001 AGENDA](#) > [AGENDA DOCUMENT 01-62](#)

This document is part of Agenda Document Number 01-62 on the agenda for consideration at the December 13, 2001, meeting of the Federal Election Commission.

Volume I, Section 5

Table of Contents

5 Telecommunications	5-1
5.1 Scope	5-1
5.1.1 Types of Components	5-1
5.1.2 Telecommunications Operations and Providers	5-2
5.1.3 Data Transmissions	5-3
5.1.4 Organization of Standards	5-4
5.2 Design, Construction, and Maintenance Requirements	5-4
5.2.1 Accuracy	5-4
5.2.2 Durability	5-4
5.2.3 Reliability	5-4
5.2.4 Maintainability	5-5
5.2.5 Availability	5-5
5.2.6 Integrity	5-5
5.2.7 Confirmation	5-5
5.3 Prohibitions	5-5

5

Telecommunications

5.1 Scope

This section contains the performance, design, and maintenance characteristics of the telecommunications components of voting systems and the acceptable levels of performance against these characteristics. For the purpose of the Standards, telecommunications is defined as the capability to transmit and receive data electronically over a distance within and external to a polling place using hardware and software components.

The requirements in this section represent acceptable levels of combined telecommunications hardware and software function and performance for the transmission of data that is used to operate the system and report official election results. Where applicable, this section specifies minimum values for critical performance and functional attributes involving telecommunications hardware and software components.

This section does not apply to other means of moving data, such as the physical transport of data recorded on paper-based media, or the transport of physical devices, such as memory cards, that store data in electronic form.

5.1.1 Types of Components

This section addresses telecommunications hardware and software across a broad range of technologies including, but not limited to:

- ◆ Dial-up communications technologies:
 - Standard landline;
 - Wireless;
 - Microwave;
 - Very Small Aperture Terminal (VSAT);

- Integrated Services Digital Network (ISDN); and
- Digital Subscriber Line (DSL);
- ◆ High-speed telecommunications lines (public and private):
 - FT-1, T-1, T-3;
 - Frame Relay; and
 - Private line;
- ◆ Cabling technologies:
 - Universal Twisted Pair (UTP) cable (CAT 5 or higher);
 - Ethernet hub/switch; and
 - Wireless connections (Radio Frequency (RF) and Infrared);
- ◆ Communications routers;
- ◆ Modems, including those internal and external to personal computers, computer servers, or other voting system components (whether installed at the polling place or central count location);
- ◆ Modem drivers, dial-up networking software;
- ◆ Channel service units (CSU)/Data service units (DSU) (whether installed at the polling place or central count location); and
- ◆ Dial-up networking applications software.

5.1.2 Telecommunications Operations and Providers

This section applies to voting-related transmissions over public networks, such as those provided by regional telephone companies and long distance carriers. This section also applies to private networks regardless of whether the network is owned and operated by the election jurisdiction.

For systems that transmit official data over public networks, this Section applies to telecommunications components installed and operated at settings supervised by election officials, such as polling places or central offices. These standards apply to:

- ◆ Components acquired by the jurisdiction for the purpose of voting, including components installed at the poll site or a central office (including central site facilities operated by vendors or contractors); and
- ◆ Components acquired by others (such as school systems, libraries, military installations and other public organizations) that are used at settings supervised by election officials, including minimum configuration

components required by the vendor but that the vendor permits to be acquired from third party sources not under the vendor's control (e.g., router or modem card manufacturer or supplier)

5.1.3 Data Transmissions

These requirements apply to the use of telecommunications to transmit data for the preparation of the system for an election, the execution of an election, and the preservation of the system data and audit trails during and following an election. While this section does not assume a specific model of voting system operations and does not assume a specific model for the use of telecommunications to support such operations, it does address:

- ◆ **Voter Authentication:** Coded information that confirms the identity of a voter for security purposes for a system that transmit votes individually over a public network;
- ◆ **Ballot Definition:** Information that describes to a voting machine the content and appearance of the ballots to be used in an election;
- ◆ **Vote Transmission to Central Site:** For systems that transmit votes individually over a public network, the transmission of a single vote to the county (or contractor) for consolidation with other county vote data;
- ◆ **Vote Count:** Information representing the tabulation of votes at any level within the control of the jurisdiction, such as the polling place, precinct, or central count; and
- ◆ **List of Voters:** A listing of the individual voters who have cast ballots in a specific election.

Additional data transmissions used to operate a voting system in the conduct of an election, but not explicitly listed above, are also subject to the standards of this section.

For systems that transmit data using public networks, this section applies to telecommunications hardware and software for transmissions between all combinations of senders and receivers indicated below:

- ◆ Polling places;
- ◆ Precinct count facilities; and
- ◆ Central count facilities (whether operated by the jurisdiction or a contractor).

5.1.4 Organization of Standards

The standards presented in this section are organized into two categories:

- ◆ **Design, Construction, and Maintenance Requirements:** This category represents the operational capability of both telecommunications hardware and software across a broad range of parameters; and
- ◆ **Prohibitions:** This category represents specific data and combinations of data that shall not be transmitted in electronic form using telecommunications.

5.2 Design, Construction, and Maintenance Requirements

Design, construction, and maintenance requirements for telecommunications represent the operational capability of both system hardware and software. These capabilities shall be considered basic to all data transmissions.

5.2.1 Accuracy

The telecommunications components of all voting systems shall meet the accuracy requirements of Section 3.2.1.

5.2.2 Durability

The telecommunications components of all voting systems shall meet the durability requirements of Section 3.4.2.

5.2.3 Reliability

The telecommunications components of all voting systems shall meet the reliability requirements of Section 3.4.3.

5.2.4 Maintainability

The telecommunications components of all voting systems shall meet the maintainability requirements of Section 3.4.4.

5.2.5 Availability

The telecommunications components of all voting systems shall meet the availability requirements of Section 3.4.5.

5.2.6 Integrity

DRE voting systems that use a public network for the casting of ballots shall be designed and configured such that they are not vulnerable to a single point of failure in the connection to the public network causing total loss of voting capabilities at any polling place.

5.2.7 Confirmation

Confirmation occurs when the system notifies the user of the successful or unsuccessful completion of the data transmission, where successful completion is defined as accurate receipt of the transmitted data.

The telecommunications components of a voting system shall:

- a. Notify the user of the successful or unsuccessful completion of the data transmission; and
- b. In the event of unsuccessful transmission, notify the user of the action to be taken.

5.3 Prohibitions

This section prohibits the transmission of specific types of voting-related information via telecommunications. Because of the limits of existing technology to prevent

unauthorized access and use of data the transmission of data using telecommunications if prohibited for the following data types:

- a. Election management database;
- b. Ballot definition programs and databases;
- c. Ballot installation programming;
- d. System programming and software installation;
- e. Pre-election test programs;
- f. Official election results (from the polling place to central office of the jurisdiction); and
- g. Voting device and system audit logs.

The data listed above shall be conveyed from one point to another by physical transport.