**U.S. ELECTION ASSISTANCE COMMISSION**
633 3rd St. NW, Suite 200
Washington, DC 20001

# EAC Decision on Request for Interpretation

# 2023-02 1.2-C Minimum Ballot Positions

## VVSG 2.0 Principle 1 High Quality Design

### Guideline 1.2:

The requirements for **Guidelines 1.2** cover how a voting system is designed to function correctly under real-world operating conditions. They address:

- **Accuracy** – the need to satisfy integrity constraints for accuracy, to achieve the required end-to-end accuracy benchmark, and the ability to reliably detect marks on the ballot.

### Sections of Standards or Guidelines:

**1.2-C – Minimum Ballot Positions**

A minimum of 10,000,000 ballot positions must be read by the voting system and tabulated accurately.

**Discussion**

The value of 10,000,000 ballot positions is taken from VVSG 1.0 [VVSG2005], however it is used here as the minimum number of ballot positions to test without error. If a larger number of ballot positions is used, there still can be no error.

### Date:

August 7, 2023

### Question(s):

Can the system collectively meet requirement 1.2-C for minimum number of ballot positions, or is each device required to read and tabulate a minimum of 10,000,000 marked or unmarked ballot positions?

If this requirement is to be met collectively by the system, is there a sample minimum for each unique tabulation device?

How will this requirement be applied to modifications to VVSG 2.0 certified systems?

How does this requirement apply to Ballot Marking Devices (BMD) that only read but do not tabulate?

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## EAC Interpretation Discussion:

Voter confidence is rooted in their vote being counted accurately and completely. Principle 1 of VVSG 2.0 supports this with requirements to carry out election processes accurately, completely, and robustly. Section 1.2 works to ensure that voting systems are designed to function correctly under real-world operating conditions.

To avoid being too prescriptive and assigning an arbitrary value regarding the minimum number of ballot positions, the EAC has not identified a sample minimum for each device. This determination must be made by the Voting System Testing Laboratory (VSTL) based on the specifications of the system in test. If a minimum of 10,000,000 marked and unmarked ballot positions are accurately read and tabulated without error by the entirety of the voting system, the requirement is met.

A similar accuracy requirement was also included in VVSG 1.0 volume 1, requirement 4.1.1. The calculation for a minimum acceptable error-free sample size per processing function utilized a probability distribution approach as identified in VVSG 1.0, volume 2, appendix C.5, which states: "For each processing function indicated above, the voting 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 positions." The probability distribution approach provides a solution of 1,549,703 ballot positions that must be read without error for each processing function. The critical difference in VVSG 2.0 is that no error is allowed during the duration of testing, therefore the distribution approach may not be used in the same way.

Requirement 1.2-C applies to both marking devices and tabulation devices, however, the language in 1.2-C is specific that 10,000,000 ballot positions need to be read ***and*** tabulated by the system. There are two types of Ballot Marking Devices (BMD) used in voting systems. One type marks and reads ballots but does not tabulate. Another type, commonly referred to as a hybrid device, can mark, read, and tabulate. When a VSTL is assessing how to apply requirement 1.2-C across a voting system, BMDs need additional consideration. If the BMD in test does not support tabulation functionality, it must still be exercised by reading marked positions. Those positions do not count toward the total number of positions required by 1.2-C unless they are also tabulated on another device within the system.

## Conclusion:

VVSG 2.0 requirement 1.2-C is more stringent than the accuracy requirements in VVSG 1.0 in that there are no errors allowed in a minimum of 10,000,000 ballot positions. These positions must be successfully read and tabulated accurately by the entire voting system.

The EAC has decided against identifying a sample minimum for each tabulation device. The distribution of 10,000,000 ballot positions across a system under test must be determined by the VSTL and approved by the EAC through the test plan for each system under test.

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Regarding modifications to VVSG 2.0 certified systems, a minimum of 10,000,000 ballot positions must still be read and tabulated by the system to be considered compliant. The VSTL will need to determine if modifications warrant accuracy testing and if applicable, how best to distribute ballot positions across the system to ensure confidence in the integrity of the voting system.

BMDs must be exercised when testing the system for requirement 1.2-C. If the BMD does not support tabulation, the ballot positions tested on the BMD must be tabulated on another device to count toward the total number of ballot positions.

**Effective Date:**

As of the date this document is published.