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**HFES Provides Six Recommendations to Improve Voting Systems by Addressing Challenges That Threaten Elections Integrity**

*New Policy Statement Outlines Recommendations for a More Sustained Democracy by Leveraging Human Factors Science In The Design Of Voting Systems*

**Washington, D.C.—October 25, 2023**—The Human Factors and Ergonomics Society ([HFES](#)) has released a new [Policy Statement on Voting Systems](#) with recommendations to address several pervasive challenges that threaten the integrity of election systems and processes in the United States.

Issues such as ballot length, format, graphic design and the complexity of ballot questions can all affect voter perceptions and errors; however, many best practices are not actively applied in elections. In addition to ballot design, registration materials, poll worker training, and materials that support mail-in voting, all impact voting accuracy.

“Designing ballots and election systems that accurately express a voter’s individual will and intent is as vital to the integrity of the election process as preventing fraud or other malfeasance,” said Michael Byrne, Ph.D., co-author of HFES’ Voting Policy Statement and Professor of Psychological Sciences at Rice University. “Because federal standards for elections are voluntary and not widespread, voting systems and regulations vary widely from state to state and even from county to county. The one element that is consistent is voters are human—and voting systems that fail to consider human capabilities and limitations will be prone to errors. Employing Human Factors science in the design of voting systems can help ensure that voting errors are significantly avoided or reduced, which increases trust in the process and strengthens the integrity of one of the fundamental pillars of a strong and stable democracy.”

The HFES policy statement highlights multiple areas in voting where Human Factors concerns are applicable, including general usability of voting systems, accessibility, overseas voting, ballot counting, ranked choice voting and ballot verification. For example, to accurately reflect voter intent, ballots and systems must be usable. This means meeting standards for usability: effectiveness, efficiency and satisfaction. (1) Effectiveness: for elections to be trustworthy, it is vital that voters’ intent be accurately captured; (2) Efficiency: in order for polling places to run smoothly, voters must be able to complete their ballots in reasonable time; and (3) Satisfaction: voters must not find the voting process too onerous and find the results trustworthy.

Because few election administrators are Human Factors experts, the HFES published the following recommendations to intentionally improve the design and implementation of successful voting systems in the United States.

***Recommendation 1 – Improve Voting System Usability Standards***

In keeping with the designation of election systems as critical infrastructure, voting systems should be required to meet established usability standards (e.g., ISO 9241-210) and follow

industry standards for designing and testing user interfaces (ANSI/HFES 400) by reporting its Human Readiness Level (HRL). The HRL assesses the degree to which a technology or system has considered human usability and performance within the technology development and testing process. In particular, all voting systems should be required to demonstrate achieving at least Level 8 of the HRL standard prior to being put into use. HFES recommends that all states adopt the HRL standards as a certification requirement.

### ***Recommendation 2 – Support the Adoption of the VVSG***

The US EAC Voluntary Voting System Guidelines (VVSG) Version 2.0 provides a set of voting-specific requirements. HFES recommends that all states adopt the VVSG 2.0 as a certification requirement. Local election jurisdictions should be encouraged and financially supported in the replacement of outdated voting systems with equipment that meets this standard.

### ***Recommendation 3 – Support Voting System Usability Research***

More research on different voting machines and processes (as instituted nationwide) is needed to develop improved guidance for ensuring voting integrity. This need should be addressed by creating a voting-specific research area at the National Science Foundation (NSF) with the collaboration and cooperation of the Accountable Institutions and Behavior (AIB) program and/or the NSF Convergence Accelerator Program (Alvarez et al., 2021), or by providing the US EAC with a grant program and specific funds directly supporting work with the National Institute of Standards of Technology (NIST) aimed at addressing shortfalls in human factors research on voting systems. This research should also address challenges associated with ballot verification, supporting audits, improving accessibility and overseas voting, and the development of improved ballot formats for ranked choice voting and new voting approaches and devices.

### ***Recommendation 4 – Develop Election Official Training Resources***

The US EAC should be funded and charged with supporting the development of highly usable and understandable resources for local election officials, including best practices to ensure that usability research results and recommendations are communicated effectively to those who must implement them. Field guides developed by the Center for Civic Design are a good example. This work should include research to ensure effective training programs and approaches.

### ***Recommendation 5 - Hand Counting***

Because human accuracy in hand counting is poor, HFES recommends against the reliance on hand counting of ballots for anything other than smaller election jurisdictions, risk-limiting audits (RLAs), or legally required recounts. Concerns regarding security are legitimate and serious, but they are best addressed by the use of rigorous audits. Risk-limiting audits (Lindeman & Stark, 2012; Morrell, 2019) are the gold standard and ensure the integrity of machine counting. However, as of 2022, only three states (i.e., Colorado, Rhode Island, and Virginia) have RLAs in statute, with four states as optional and eight with various stages of pilot programs (NCSL, 2022). These audits better align with human capabilities than counting large numbers of ballots and should be deployed universally alongside machine counting to verify accuracy. Therefore, HFES also recommends that states adopt RLA programs, especially if jurisdictions in that state require that ballots be tabulated by hand.

***Recommendation 6 – Create a National Center for Voting System Usability Evaluation***

A national Center for Voting System Usability Evaluation should be created that would establish usability standards for voting systems and would provide the capability for voluntary usability certification of voting systems.

To read the full policy statement or learn more about HFES, visit: [hfes.org](https://www.hfes.org).

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**About Human Factors and Ergonomics Society (HFES)**

Founded in 1957, HFES is the world's largest scientific association for human factors/ergonomics professionals. HFES serves the needs of members and the public by promoting and advancing the discovery and exchange of knowledge concerning the characteristics of human beings that are applicable to the design of systems, products, tools, and environments of all kinds. The society's more than 3,000 members work in educational institutions, companies, government and military research centers, and independent consultancies in 58 countries. About 15 percent of members are students. For more information, please visit <https://www.hfes.org/>.