

Review of CRT Changes

Prepared at the direction of the CRT Subcommittee of the TGDC

February 28, 2007

This paper has been prepared by the National Institute of Standards and Technology at the direction of the CRT subcommittee of the Technical Guidelines Development Committee (TGDC). It may represent preliminary research findings and does not necessarily represent any policy positions of NIST or the TGDC.

The Technical Guidelines Development Committee is an advisory group to the Election Assistance Commission (EAC), which produces Voluntary Voting System Guidelines (VVSg). Both the TGDC and EAC were established by the Help America Vote Act of 2002. NIST serves as a technical adviser to the TGDC.

Review of CRT Changes

This document summarizes the major primary changes that were made to CRT text since the December TGDC meeting. To keep it short, the incidental and consequential changes needed to harmonize other parts of the text with those primary changes are not listed, nor are numerous editorial changes and nit-fixes.

Volume II, Terminology Standard

Consistent with Resolution #10-06, revised the Glossary to remove the definition of Mean Time Between Failure and add a definition of failure rate as a placeholder until the data necessary to finalize the reliability requirement have been collected.

Defined "election official" as the union of central election officials, election judges, and poll workers.

Adjusted definition of EBM to clarify that the resulting ballot is assumed to be human-readable, and noted that vote-by-phone systems are EBMs.

Defined "candidate" and "choice" to cover everything for which a ballot position could indicate a vote.

Defined "reporting context."

Volume III, Product Standard

Principal Criteria

Added text in satisfaction of TGDC Resolution #09-06 to Volume III, Section 1.2 (Product Standard, Scope and Applicability).

General requirements

Cleaned up requirements linking system and device levels for voting variations.

Benchmarks

Consistent with Resolution #10-06, revised Volume III, Section 5.3.1 (Reliability) to remove the Mean Time Between Failure benchmark and add a failure rate benchmark as a placeholder until the data necessary to finalize the reliability requirement have been collected.

Coding conventions

Modified requirements and discussion text as needed to clarify that a COTS add-on that brings a programming language into compliance with the structured programming requirements is acceptable. The introductory text in Volume III Section 1.4.5 underwent a major revision.

Archivalness of media

Added temperature and humidity specification to Req. III.5.5.1-A, Records last at least 22 months. Unless otherwise directed, this spec is to remain harmonized with the temperature and humidity under which voting systems are required to operate. These are not as harsh as the storage conditions for voting systems.

Tabulation integrity

Added a requirement to clarify that voting systems are required to detect and prevent ballot style mismatches of the sort that have been blamed for tabulation errors, with a reference to the existing L&A testing requirements that should have prevented it happening in the first place.

Added a requirement that paper-based tabulators either (a) correctly count ballots regardless of whether they are fed upside down, right side up, forward, or reversed; or (b) detect and reject ballots that are oriented incorrectly.

Logic model

Added formal definitions for undervote and overvote tallies; eliminated terms associated with ballot activation; simplified the model.

Volume IV, Standards on Data to be Provided

User documentation

Added "functional diagram" as described in U.S. Election Assistance Commission, Testing and Certification Program Manual, Version 1.0, 4.3.2.3, to the top level of the system overview. (The same information was already required in subsequent sections, but not as concisely.)

Required vendors to specify paper for any system that has a printer. The specification is to ensure correct operation, minimize jamming, and satisfy the 22-month archivalness requirement.

Required vendors to document the available algorithms for reconciling write-in double votes. (This implementation-defined behavior is explained in a new introductory section, Volume III Section 1.5.4, Logic for reconciling write-in double votes.)

Test report and Public Information Package

Harmonized requirements with U.S. Election Assistance Commission, Testing and Certification Program Manual, Version 1.0.

Adjusted Req. IV.5.1-L (Test report, shoulds that were not done) to clarify the situation with respect to untestable shoulds. (Sometimes a requirement is a "should" not a "shall" only because no test method could be determined to assess conformity with it, so it makes no sense to require test results to be reported for it.)

Volume V, Testing Standard

Documentation and design reviews

Added requirement for test labs to review COTS manufacturers' specifications to verify that the use of the COTS in the voting system is not a disapproved, out-of-spec or off-label application.

Functional testing

Adjusted requirements to avoid mandating structural testing of portions of third-party logic that are never used in any way by the voting application. (Concerns about the existence of unused code in the first place are a separate, STS issue.)

Replaced reference to California Volume Reliability Testing Protocol with specifications for the volume test to be conducted.

In lieu of closure on the conformity assessment vs. fitness-for-purpose issue that was debated at the December 2006 TGDC meeting without resolution, added discussion text similar to the following after each impacted requirement:

Since the nature of the requirements specified by the vendor-supplied system documentation is unknown, conformity for implementation-specific functionality may be subject to interpretation. Nevertheless, egregious disagreements between the behavior of the system and the behavior specified by the vendor should lead to a defensible adverse finding.

Benchmarks

Revised Volume V, Section 5.3 (test methods for reliability, accuracy, and probability of misfeed) consistent with outcome of December 2006 TGDC meeting.

Made minor clarifications to the definition of report total error rate.