**Test Assertions for VVSG 1.0 Section 3.2.2.1**

**August 24, 2015**

**Requirement 3.2.2**

**VVSG 1.0 Requirement 3.2.2:** The voting process shall be accessible to voters with visual disabilities.

**Note:** This is a high-level requirement that is fulfilled by the lower-level ones.

**Test Assertions**

None.

**Requirement 3.2.2.1**

**VVSG 1.0 Requirement 3.2.2.1:** The accessible voting station shall be accessible to voters with partial vision.

**Note:** This is a high-level requirement that is fulfilled by the lower-level ones.

**Test Assertions**

None.

**Requirement 3.2.2.1a**

**VVSG 1.0 Requirement 3.2.2.1a:** The vendor shall conduct summative usability tests on the voting system using partially sighted individuals. The vendor shall document the testing performed and report the test results using the Common Industry Format. This documentation shall be included in the Technical Data package submitted to the EAC for national certification.

**Test Assertions**

**TA3221a-1:** The manufacturer SHALL conduct realistic summative usability tests on the features of the voting system used by partially sighted individuals during the voting session.

**TA3221a-2:** The summative usability tests SHALL be performed upon a completely functioning product.

**TA3221a-3:** The summative usability tests SHALL use individuals whose visual acuity is less than 20/70 but greater than or equal to 20/200.

**TA3221a-3-1:** The summative usability tests SHALL use individuals who can only read large-print, high contrast text.

**TA3221a-3-2:** The summative usability tests SHALL NOT use individuals who can read normal-sized text, even when wearing glasses or contacts, unless held very close to their face.

**TA3221a-3-3:** The population under test SHALL consist of a mix of voters including, but not limited to, users of different ages, genders, ethnicities, levels of education, voting experience.

**TA3221a-3-4:** The population under test SHALL consist of voters who are eligible to vote in the U.S.

**TA3221a-3-5:** The population under test SHALL NOT consist of voters who are, or have been, a poll worker, a voting machine manufacturer, a voting machine developer, in the marketing or sales of voting systems, or involved in any other position that is part of the voting process.

**TA3221a-3-6:** The population under test SHALL NOT consist of voters who are involved with a usability or market research business/company.

**TA3221a-3-7:** The population under test SHOULD NOT consist of voters who have previously participated in a voting system usability test.

**TA3221a-4:** The manufacturer SHALL report the total number of participants tested and demographics of the participants.

**TA3221a-5:** Manufacturers SHOULD describe their recruiting strategy.

**TA3221a-6:** The manufacturer SHOULD detail any compensation given to participants.

**TA3221a-7:** The manufacturer SHALL describe how the voters were screened and selected.

**TA3221a-8:** The manufacturer SHOULD note any differences between the users profiled as recruits and the users who participated in the actual study.

**TA3221a-9:** The manufacturer SHALL ensure that at least eight partially sighted test participants are able to complete the testing session, without assistance.

**TA3221a-9-1:** The manufacturer SHOULD initially target at least 10 - 12 partially sighted participants, in order to ensure that at least 8 partially sighted individuals are able to complete the testing sessions.

**TA3221a-10:** The manufacturer SHOULD ensure that at least 30 test participants are able to complete the testing session.

**TA3221a-11:** The manufacturer SHOULD include detailed tables of all participant demographics, whether or not they completed the test, as an appendix to the test report.

**TA3221a-12:** The manufacturer SHALL report the test results for all participants, whether or not they completed the test, using the Common Industry Format.

**TA3221a-13:** The manufacturer SHOULD use the Modified CIF Template for manufacturers as a template and guidance for the semantics, content and testing.

**TA3221a-14:** Manufacturers MAY define their own testing protocols for the summative usability tests.

**TA3221a-15:** The Technical Data Package submitted to the EAC for national certification SHALL contain the summative Usability Test Report.

**TA3221a-16:** The summative usability tests SHALL measure and report metrics for efficiency, effectiveness, and satisfaction as defined in the ISO/CIF standard.

**TA3221a-17:** The test ballot used in the summative usability tests, conducted by the manufacturer, SHALL be realistic.

**TA3221a-17-1:** The test ballot used in the summative usability tests SHOULD look like a real ballot, such as the NIST test ballot.

**TA3221a-17-2:** The test ballot used in the summative usability tests SHOULD have 12 contests.

**TA3221a-17-3:** The test ballot used in the summative usability tests SHOULD have 2 ballot questions.

**TA3221a-17-4:** The test ballot used in the summative usability tests SHOULD have 5 propositions.

**TA3221a-17-5:** The test ballot used in the summative usability tests SHOULD have at least one multiple-vote contest.

**TA3221a-17-6:** The test ballot used in the summative usability tests SHOULD have at least one write-in contest.

**TA3221a-18:** The test script used in the summative usability tests, conducted by the manufacturer, SHALL be realistic.

**TA3221a-18-1:** The test script SHALL enable testing of all valid operations for the voter interface under test.

**TA3221a-19:** The testing environment for the summative usability tests, conducted by the manufacturer, SHALL be realistic.

**TA3221a-19-1:** The testing environment SHOULD be set up as it would be in a polling place.

**TA3221a-20:** The summative usability tests conducted by the manufacturer MAY use the NIST medium complexity test ballot.

**TA3221a-21:** The manufacturer SHALL ensure that the summative usability documentation/report is included in the TDP.

**TA3221a-22:** The manufacturer SHALL ensure that the summative usability documentation/report conforms to the formatting and content requirements of the Common Industry Format (CIF).

**Requirement 3.2.2.1b**

**VVSG 1.0 Requirement 3.2.2.1b:** The accessible voting station with an electronic image display shall be capable of showing all information in at least two font sizes (a) 3.0-4.0 mm and (b) 6.3-9.0 mm.

**Test Assertions**

**TA3221b-1:** IF the accessible voting station contains an electronic image display THEN the adjustment of the displayed font size SHALL be under the control of the voter.

**TA3221b-2:** IF the accessible voting station contains an electronic image display THEN the voter SHALL be able to show all information in at least two font sizes.

**TA3221b-2-1:** IF the accessible voting station contains an electronic image display THEN the voter SHALL be able to show all information in font sizes within the range of 3.0-4.0 mm, inclusive, as measured on the screen.

**TA3221b-2-2:** IF the accessible voting station contains an electronic image display THEN the voter SHALL be able to show all information in font sizes within the range of 6.3-9.0 mm, inclusive, as measured on the screen.

**Requirement 3.2.2.1c**

**VVSG 1.0 Requirement 3.2.2.1c:** An accessible voting station with a monochrome-only electronic image display shall be capable of showing all information in high contrast either by default or under the control of the voter or poll worker. High contrast is a figure-to-ground ambient contrast ratio for text and informational graphics of at least 6:1.

**Test Assertions**

**TA3221c-1:** IF an accessible voting station contains a monochrome-only electronic image display THEN the display SHALL be capable of showing all information in a figure-to-ground ambient contrast ratio for text and informational graphics of at least 6:1.

**TA3221c-2:** IF an accessible voting station contains a monochrome-only electronic image display THEN the display SHALL show all information in high contrast either by default, under the control of the voter, or under control of the poll worker.

**Requirement 3.2.2.1d**

**VVSG 1.0 Requirement 3.2.2.1d:** An accessible voting station with a color electronic image display shall allow the voter to adjust the color or the figure-to-ground ambient contrast ratio.

**Test Assertions**

**TA3221d-1:** IF an accessible voting station contains a color electronic image display THEN the display SHALL allow the voter to adjust the color or the display SHALL allow the voter to adjust the figure-to-ground ambient contrast ratio.

**TA3221d-2:** IF an accessible voting station contains a color electronic image display THEN the display SHOULD allow the voter to adjust the color saturation throughout the voting session while preserving the current votes by utilizing at least one of the following two options: 1) black text on white background or 2) white text on black background.

**Requirement 3.2.2.1e**

**VVSG 1.0 Requirement 3.2.2.1e:** Buttons and controls on accessible voting stations shall be distinguishable by both shape and color.

**Test Assertions**

**TA3221e-1:** On accessible voting stations, voters SHALL be able to distinguish on-screen buttons from all other on-screen elements by shape.

**TA3221e-2:** On accessible voting stations, voters SHALL be able to distinguish hardware buttons from all other hardware elements by shape.

**TA3221e-3:** On accessible voting stations, voters SHALL be able to distinguish on-screen buttons from all other on-screen elements by color.

**TA3221e-4:** On accessible voting stations, voters SHALL be able to distinguish hardware buttons from all other hardware elements by color.

**TA3221e-5:** On accessible voting stations, voters SHALL be able to distinguish on-screen controls from all other on-screen elements by shape.

**TA3221e-6:** On accessible voting stations, voters SHALL be able to distinguish hardware controls from all other hardware elements by shape.

**TA3221e-7:** On accessible voting stations, voters SHALL be able to distinguish on-screen controls from all other on-screen elements by color.

**TA3221e-8:** On accessible voting stations, voters SHALL be able to distinguish hardware controls from all other hardware elements by color.

**Requirement 3.2.2.1f**

**VVSG 1.0 Requirement 3.2.2.1f:** An accessible voting station using an electronic image display shall provide synchronized audio output to convey the same information as that which is displayed on the screen.

**Test Assertions**

**TA3221f-1:** IF an accessible voting station uses an electronic image display THEN the voting station SHALL provide audio output.

**TA3221f-2:** The audio output provided SHALL be synchronized in order to convey the same information as that which is displayed on the screen.

**TA3221f-3:** The voting station SHOULD allow the voter to disable the audio output resulting in a video-only presentation.

**TA3221f-4:** The voting station SHOULD allow the voter to disable the video output resulting in an audio-only presentation.

**TA3221f-5:**  The voting station SHOULD allow the voter to switch among the three modes (synchronized audio/video, video-only, or audio-only) throughout the voting session while preserving the current votes.