**Test Assertions for VVSG 1.0 Section 3.1.5**

**August 24, 2015**

**Requirement 3.1.5a**

**VVSG 1.0 Requirement 3.1.5a:** No voting machine display screen shall flicker with a frequency between 2 Hz and 55 Hz.

**Test Assertions**

**TA315a-1:** ALL content presented on a voting machine display screen SHALL have a flicker frequency that is either less than 2 Hz, or more than 55 Hz, but NOT between 2 Hz and 55 Hz, as measured.

**Requirement 3.1.5b**

**VVSG 1.0 Requirement 3.1.5b:** Any aspect of the voting machine that is adjustable by the voter or poll worker, including font size, color, contrast, and audio volume, shall automatically reset to a standard default value upon completion of that voter’s session.

**Test Assertions**

**TA315b-1:** There SHALL be no discernible differences in ALL voter configurable aspects at the beginning of ALL voting sessions.

**TA315b-2:** There SHALL be no discernible differences in ALL poll worker configurable aspects that are presented to the voter at the beginning of ALL voting sessions.

**TA315b-3:** IF a voter changes font size during the voting session, THEN at the beginning of the next voting session, the font size SHALL have the original default value.

**TA315b-4:** IF a poll worker changes font size during the voting session, THEN at the beginning of the next voting session, the font size SHALL have the original default value.

**TA315b-5:** IF a voter changes color during a voting session, THEN at the beginning of the next voting session, the color SHALL have the original default value.

**TA315b-6:** IF a poll worker changes color during a voting session, THEN at the beginning of the next voting session, the color SHALL have the original default value.

**TA315b-7:** IF a voter changes contrast during a voting session, THEN at the beginning of the next voting session, the contrast SHALL have the original default value.

**TA315b-8:** IF a poll worker changes contrast during a voting session, THEN at the beginning of the next voting session, the contrast SHALL have the original default value.

**TA315b-9:** IF a voter changes audio volume during a voting session, THEN at the beginning of the next voting session, the audio volume SHALL have the original default value.

**TA315b-10:** IF a poll worker changes audio volume during a voting session, THEN at the beginning of the next voting session, the audio volume SHALL have the original default value.

**Requirement 3.1.5c**

**VVSG 1.0 Requirement 3.1.5c:** If any aspect of a voting machine is adjustable by the voter or poll worker, there shall be a mechanism to reset all such aspects to their default values.

**Test Assertions**

**TA315c-1:** At any time during a voting session, an explicit reset to default mechanism (or mechanisms) SHALL exist for a voter to change ALL voter configurable values back to their original default state.

**TA315c-2**: At any time during a voting session, a capability SHALL exist for a poll worker to change ALL poll worker configurable values back to their original default state.

**Requirement 3.1.5d**

**VVSG 1.0 Requirement 3.1.5d:** All electronic voting machines shall provide a minimum font size of 3.0 mm (measured as the height of a capital letter) for all text.

**Test Assertions**

**TA315d-1:** FOR all text content on a visual electronic display, the measured height of all capital letters in that text content SHALL be at least 3.0 mm.

**Requirement 3.1.5e**

**VVSG 1.0 Requirement 3.1.5e:** All voting machines using paper ballots should make provisions for voters with poor reading vision.

**Test Assertions**

**TA315e-1:** IF a voting system uses paper ballots, THEN the voting system SHOULD provide voters with poor reading vision a means to read the ballot.

**TA315e-2:** IF a voting machine uses paper ballots, THEN the voting machine MAY provide paper ballots in at least two font size ranges, 3.0mm to 4.0mm inclusive and 6.3mm to 9.0 mm inclusive, to allow voters with poor reading vision to read the ballots.

**TA315e-3:** IF a voting machine uses paper ballots, THEN the voting machine MAY provide a magnifying device to allow voters with poor vision a means to read the ballots.

**TA315e-3-1:** IF a voting machine uses paper ballots, THEN the manufacturer MAY provide the magnifier itself as part of the system.

**TA315e-3-2:** IF a voting machine uses paper ballots, THEN the manufacturer MAY provide the make and model number of readily available magnifiers that are compatible with the system.

**Requirement 3.1.5f**

**VVSG 1.0 Requirement 3.1.5f:** The default color coding shall maximize correct perception by voters with color blindness.

**Test Assertions**

**TA315f-1:** A visual voting system’s display MAY use high luminosity contrast in order to be able to recognize visual features.

**TA315f-2:** Color-coded graphics in a visual voting system’s display MAY use shape to improve the voter’s ability to distinguish features.

**TA315f-3:** A visual voting system SHOULD present ordinary information to the voter in black text on a white background.

**TA315f-4:** A visual voting system SHOULD reserve the use of color for special cases (including but not limited to warnings or alerts).

**TA315f-5:** A visual voting system SHOULD not present information to the voter in the form of colored text on a colored background.

**TA315f-6:** FOR all information provided to the voter by a visual voting system, no other than the following four possibilities SHOULD be allowed: (i) white text and colored background, (ii) colored text and white background, (iii) black text and colored background, or (iv) colored text and black background.

**TA315f-7:** FOR a voting system, if any text is colored other than black or white, THEN all of the following SHALL be true: (i) the background SHOULD be black or white, (ii) the text SHOULD be presented in a bold font (minimum 0.6 mm stroke width), (iii) IF the background is black, THEN the text color SHALL be yellow or light cyan, and (iv) IF the background is white, THEN the text color SHOULD be dark enough to maintain a 10:1 contrast.

**TA315f-8:** IF the background is colored other than black or white on a visual voting system, THEN the following SHOULD be true of the presentation: (i) the text color SHALL be black, and (ii) the background color SHALL be yellow or light cyan.

**Requirement 3.1.5g**

**VVSG 1.0 Requirement 3.1.5g:** Color coding shall not be used as the sole means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

**Test Assertions**

**TA315g-1:** A visual voting system SHALL use a non-color mode, in tandem with any implemented color coding, to convey all information to a voter using that system.

**TA315g-2:** A visual voting system MAY use shapes (such as red enclosed in an octagon shape), in tandem with any implemented color coding, to convey information to a voter using that system.

**TA315g-3:** A visual voting system MAY use text styles (such as italic), in tandem with any implemented color coding, to convey information to a voter using that system.

**TA315g-4:** FOR a visual voting system, NO icon or control SHALL BE distinguishable only by color to a voter using that system.

**TA315g-5:** A visual voting system MAY use any other non-color method, in tandem with any implemented color coding, to convey information to a voter using that system.

**Requirement 3.1.5h**

**VVSG 1.0 Requirement 3.1.5h:** All text intended for the voter should be presented in a sans serif font.

**Test Assertions**

**TA315h-1:** FOR a voting system, all text presented to a voter using that system SHOULD use a sans-serif font.

**Requirement 3.1.5i**

**VVSG 1.0 Requirement 3.1.5i:** The minimum figure-to-ground ambient contrast ratio for all text and information graphics (including icons) intended for the voter shall be 3:1.

**Test Assertions**

**TA315i-1:** FOR a voting system with an electronic screen medium, all text and information graphics contained in instructions (built-in or external) on the use of the system, intended for the voter, SHALL have a measured contrast ratio of at least 3:1.

**TA315i-2:** FOR a voting system with an electronic screen medium, all text and information graphics contained in the actual ballot or ballot interface, intended for the voter, SHALL have a measured contrast ratio of at least 3:1.

**TA315i-3:** FOR a voting system with an electronic screen medium, all text and information graphics contained in the review screen, intended for the voter, SHALL have a measured contrast ratio of at least 3:1.

**TA315i-4:** FOR a visual voting system with a “non-electronic” medium, the measured luminance of all foreground text and information graphics (contained in instructions, built-in or external, on the use of the system), intended for the voter, SHALL be at least three times the measured luminance of all corresponding backgrounds.

**TA315i-5:** FOR a visual voting system with a “non-electronic” medium, the measured luminance of all foreground text and information graphics (contained in the actual ballot or ballot interface), intended for the voter, SHALL be at least three times the measured luminance of all corresponding backgrounds.

**TA315i-6:** FOR a visual voting system with a non-electronic medium, the measured luminance of all foreground text and information graphics (contained in the voter verifiable audit records), intended for the voter, SHALL be at least three times the measured luminance of all corresponding backgrounds.