Flash® Accessibility Requirements and Methods (FARM) v2.0

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Revision History

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Use Case 1. Blind or Visually Impaired Users

Requirement 1.1 Reading Order

1.1.1 Reading Order. Provide a logical reading order including all relevant text fields, selectable elements and movieclips.

Method: Perform an Action Analysis and determine Action Sequence.
Method: Assign Reading Order by using the Tab Index field in the Accessibility Panel.
Method: Program Reading Order by using the `.tabindex` property in ActionScript®.
Method: Exclude elements from Reading Order by using the `.silent` property in ActionScript®.
Method: Avoid Invisible Buttons. Buttons and movieclips with button properties, that do not have an 'up' state, are not be recognized by a screen reader.

WCAG 2.0:
1.3.2 Meaningful Sequence
2.4.3 Focus Order
Section 508: § 1194.21 (c)
BPAFD – Control Reading Order

Requirement 1.2 Text Equivalents

1.2.1 Text Equivalents. Provide meaningful written or spoken Text Equivalents (also called Descriptions, or Alt(ernative) Text) for…
  1.2.1.1 Movieclips used as graphics
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  1.2.1.6 Time Based Presentations or Animations
1.2.2 Text Equivalents for Children. Descriptions should be programmed to match the assistive technology used by the target audience:
  1.2.2.1 Self-voicing. Content targeted to early or non-assistive technology users (preK - 1st grade), should make use of self-voicing or system level audio.

Method: Assign Text Equivalents by using the Name field in the Accessibility Panel.
Method: Program Text Equivalents by using the `.name` property in ActionScript.
Method: Include Hidden Text Fields in the Reading Order with Text Equivalents.
Method: Include Text Equivalents in the form of Audio Description (AD) or Textual Description (TD) for time based presentations or animations.
Method: Attach system-level (self-voicing) audio by using the `.onRollOver` property of buttons and movieclips.

WCAG 2.0:
1.1.1 Non-text Content
1.2.3 Audio Description or Media Alternative

1.2.5 Audio Description
1.2.7 Audio Descriptions (Extended)
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BPAFD – Provide Text Equivalents

Requirement 1.3 Differentiation

1.3 Ensure users can differentiate between sounds and objects.
1.3.1 Audio Interference. Ensure that foreground and background audio do not interfere with each other and that background or other audio does not interfere with screen reader audio. Provide control over audio playback.
1.3.2 Soundeffects. Ensure that users can distinguish between different interface sounds and sound effects. Add a sound guide where necessary.
1.3.3 Color. Do not depend on color alone as a visual indicator.
1.3.4 Contrast. Ensure that foreground and background color combinations provide sufficient contrast.
1.3.5 Scale. Ensure that pixel fonts and text smaller than 12pt size can be resized. Do not disable the Context Menu (Right-Click Menu) zoom options in the Flash Player.
1.3.6 Buttons. Ensure that buttons or movieclips with button properties that only have an `onRollOver` event are not read as buttons.

Method: Integrate figure and ground in design. Establish perceptual layers and hierarchy.
Method: Use third party validation software, such as WCAG Contrast Ratios, Contrast Calculator or ColorDoctor by Fujitsu.
Method: Program a mechanism for magnifying by using the `.setTextFormat()` property in ActionScript.

WCAG 2.0
1.3.3 Sensory Characteristics
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1.4.3 Contrast (minimum)
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1.4.8.5 Visual Presentation
Section 508: § 1194.22 (c), §1194.22 (i)
BPAFD – Use Color Wisely, Support Users with Low Vision, Provide Control over Audio Playback.

Requirement 1.4 Context

1.4 Provide contextual information about relationships between elements.
1.4.1 Screen Headings. Each screen has a heading or title or other meaningful description of the screen's content and purpose. The user's location on each screen respective to other screens should be clear.

1.4.2 Organization. Simplify navigation through Progressive Disclosure. For pages with involved structures and more than 20 selectable elements, provide a ‘help’ or ‘about this page’ section at the top of the page, that explains the page structure.
1.4.3 Link Destinations. Clearly identify the target of each link.

Method: Include hidden text fields.
Method: Expand Text Equivalents.

WCAG 2.0:
2.4.2 Page Titles
2.4.4 Link Purpose (In Context)
2.4.6 Heading and Labels
2.4.8 Location
2.4.9 Link Purpose (Link Only)
2.4.10 Section Headings
Section 508: § 1194.22 (i)
BPAFD – Provide Context

Use Case 2. Mobility Impaired Users

Requirement 2.1 Tab Order

2.1.1 Keyboard Access. All functionality of the content is operable through the keyboard alone.
2.1.2 Adjustable Timing. Timing should be adjusted in time based interactions such that keyboard throughput can equal mouse based throughput.
2.1.3 Toggle Buttons. All toggle buttons should maintain focus after selection.
2.1.4 Only Selectable Elements are Tabbable. Movieclips used as graphics or animations that are not selectable should be taken out of the Tab Order.
2.1.5 Control Focus. Focus is controlled in Flash by the `.focusrect` property and indicated by a default yellow focus rectangle called the focusrect. Control or re-set focus to favor the Action Sequence where possible. Note that the focus can be controlled for the Tab Order, but not for the Reading Order.

Method: Assign Tab Order by using the Tab Index field in the Accessibility Panel.
Method: Program Tab Order by using the `.tabindex` property in ActionScript.
Method: Take Elements out of the Tab Order by using the `.tabenabled` property.
Method: Control focus and skip elements in the Tab Order by using the `Selection.setFocus(instanceName)` property in ActionScript.

WCAG 2.0:
2.1.1 Keyboard
2.1.2 Keyboard Trap
2.1.3 Keyboard (No Exception)
2.2.1 Adjustable Timing
2.4.3 Focus Order

3.2.1 On Focus.
Section 508: § 1194.21 (a), §1194.21 (b), §1194.22 (p)
BPAFD – Ensure Keyboard Access

Requirement 2.2 Differentiation

2.2.1 Visible Focus. Selectable elements should have hitareas that are large enough to accommodate the focusrect. It is not recommended to turn the focusrect off. If the yellow focusrect is turned off, all selectable elements should have clear rollover states.

Method: Give focus to elements by using the `Selection.setFocus(instanceName)` property in ActionScript. Extend the hitarea to accommodate the focusRect.

WCAG 2.0: 2.4.7 Focus Visible
Section 508: §1194.21 (c)

Requirement 2.3 Keyboard Shortcuts

2.3.1 Keyboard Shortcuts. Keyboard Shortcuts are recommended when a) there is repeatable and consistent navigation and/or b) there are more than 30 selectable elements on screen.
2.3.2 Single Keys. All Access Keys or Keyboard Shortcuts are activated by single and sequential or mnemonic keystrokes.
2.3.3 Multi-Modal. Keyboard Shortcuts are revealed to both visually impaired, and mobility impaired users.
2.3.4 Interference. No keyboard shortcuts should interfere with system-level operations.
2.3.5 Focus. Give focus to buttons or movieclips with button properties, after having been selected by a keyboard shortcut.

Method: Program Keyboard Shortcuts by using the KeyListener properties in ActionScript.
Method: Use `Selection.setFocus` to give focus to buttons or movieclips with button properties.

Section 508: § 1194.21 (b)
BPAFD – Ensure Keyboard Access

Use Case 3. Deaf or Hearing Impaired Users

Requirement 3.1 Captions

3.1.1 Captions. Provide synchronized captions for all audio and soundeffects, except for button clicks and other functional interface sounds.
3.1.2 Captions for Children. For text-based captions targeted to children, match caption speed and content display to the average Reading Rate of the target audience:

3.1.2.1 Signed Captions. Non- and Early Readers (preK grade). Captions have to be signed.
3.1.2.2 Edited or Paced captions. Early and Transitional Readers (1^{st} – 3^{rd} grade). The content should be segmented, so that there is enough time to read the captions, or the captions should be edited to match reading abilities. Present simplified language and shorter sentences at a slower rate. Primary fonts should be used.
3.1.2.3 Paced Captions. Moderate Readers (4^{th} – 10^{th} grade). Captioning speed should be held between 60 wpm - 180 wpm.
3.1.3 Adaptive Captions. Provide Synchronized Captions in the form of sign language in cases where text-based captions do not satisfy learning objectives (such as in spelling and language lessons).

Method: Place captioning directly on the stage.
Method: Add captioning via XML.
Method: Add captioning via Third Party software.
Method: Add video or animated sign language interpretation.

WCAG 2.0:
1.2.2 Captions
1.2.6 Sign Language (Prerecorded)
Section 508: §1194.22 (b)
BPAFD – Provide Captions

Use Case 4. Cognitive Impaired Users

Requirement 4.1 Eliminate Distractions

4.1 Eliminate distractions of various elements in the content.
4.1.1 Readability. Check for ease of reading and make sure all content has been written at the appropriate target age level.
4.1.2 Avoid Blinking, Flashing and Flickering. Avoid any Blink, Flash or Flicker for any notification purposes. For any other purposes, keep to allowed limit. (See Glossary for definitions).
4.1.3 Settle Animation. Make sure that all animated elements, such as text fields and animations, either settle after three (3) seconds or are provided with playback controls. Text should not be animated other than for transitional purposes, not to exceed three (3) seconds.
4.1.4 Jarring Audio or Soundeffects. No audio or soundeffects should distract from the main content.

Method: Check the reading level with software such as Readability Studio by Oleander Solutions.
Method: Provide full playback control over animations.
Method: Make audio visible and give user control over mute and volume.

WCAG 2.0:

2.2.2 Pause, Stop, Hide.
2.3.1 Three Flashes or Below Threshold
2.3.2 Three Flashes
2.1.3 Unusual Words
3.1.5 Reading Level
Section 508: §1194.21 (k), §1194.22 (j)
BPAFD – Control Animations

Requirement 4.2 Clarity

4.2 Provide clearness in perception and understanding of the content.
4.2.1 Consistency. Provide a consistent structure and navigation.
4.2.2 Simplicity. Simplify navigation and manage complexity. This will benefit all users, especially cognitive impaired and screen reader users.
4.2.3 Perceptual Organization. Ensure that the elements of a screen are structured and that similar elements are grouped together.
4.2.4 Clickability. Provide a consistent button treatment. A lack of Clickability Affordance can cause users to overlook features.

Method. Use Progressive Disclosure to simplify navigation.
Method: Use symmetry to ensure balance, alignment to establish visual relationships and shape the display with negative space.

WCAG 2.0:
2.4.1 Bypass Blocks
3.2.3 Consistent Navigation
3.2.4 Consistent Identification
Section 508: § 1194.22 (o)
BPAFD – Progressive Disclosure

Glossary

Accessibility Panel A self-contained property inspector in the Flash development environment that lets you set accessibility options for Flash objects. An alternative approach is to add accessibility properties using ActionScript.

Access Keys Keyboard shortcuts that are programmed to facilitate access to elements via the keyboard for users with a disability.

ActionScript® Scripting language owned by Adobe® used primarily for development of software for the Adobe Flash Player.

Action Analysis Evaluation procedure in which the sequence of actions a user has to perform to complete a task with an interface is examined and determined.

Audio Description (AD) Additional narration track for blind and visually impaired users that describes what is happening on the screen during natural or programmed pauses in the audio of visual media, videos or animations.

Blink A repeating shift of an object along the same path, i.e. to open and close an eyelid, for more than three (3) successive times in a one second period.

Clickability Affordance Treatment of a button that makes it look clickable. An example would be underlined text in HTML or a shadow treatment in Flash.

Flash A shift of brightness for more than three (3) successive times in a one second period.

Flicker A shift of hue (color) for more than three (3) successive times in a one second period.

Perceptual Grouping Strategy in UI design, where similar elements and functional units are bound together through symmetry and alignment.

Progressive Disclosure Strategy to manage complexity of features in user interfaces, where initially a smaller primary set of features is offered, and a secondary set is offered upon request.

Reading Order Order in which elements on the stage receive focus by assistive technologies for the blind and visually impaired, such as screen readers and Braille displays. The reading order is determined by the .tabindex property. The .silent property can be used to leave elements with a tab index out of the reading order.

Reading Rate Rate of reading measured in words per minute (wpm). The average Reading Rate for comprehension is about 200-400 wpm.

Tab Order Order in which elements on the stage receive focus by using the Tab key to navigate. The tab order is determined by the same .tabindex property as the reading order. The .tabenabled property can be used to leave elements with a tab index out of the tab order.

Text Equivalent Body of words that represent the equivalent of a non-text element, such as movieclips used for animations or images, buttons and components. Text Equivalents can be in written (type) or spoken (audio) form.

Textual Description (TD) Full script for blind and visually impaired users that describes all audio and describes what is happening on the screen of visual media, videos or animations.

Accessible Flash Checklist

Screen: _____

Use Case 1. Blind or Visually Impaired Users

Source	ID#	Success Criterion	Yes/No
Requirement 1.1 Reading Order			
FARM	1.1.1	**Reading Order.** Provide a logical reading order including all relevant text fields, selectable elements and movieclips.	
Equivalent Guidelines			
WCAG2.0	1.3.2	Meaningful Sequence: When the sequence in which content is presented affects its meaning, a correct reading sequence can be programmatically determined. (Level A)	
WCAG2.0	2.4.3	Focus Order: If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability. (Level A)	
SEC508	§ 1194.21 (c)	A well-defined on-screen indication of the current focus shall be provided that moves among interactive interface elements as the input focus changes. The focus shall be programmatically exposed so that assistive technology can track focus and focus changes.	
ADOBE FADG		Enable control over reading order. The default reading order of a movie created with Flash may not follow the same order that the designer would expect based on the visual layout. There are at least three means of controlling reading order. First, the designer or developer can limit the physical size of the stage and keep the layout simple. Second, the designer or developer can develop a secondary control that places a linear version of the content offstage. Third, the reading order can be specified using ActionScript®.	
Requirement 1.2 Text Equivalents			
FARM	1.2.1	**Text Equivalents.** Provide meaningful written or spoken Text Equivalents for… 1.2.1.1 Movieclips used as graphics 1.2.1.2 Movieclips used as animations 1.2.1.3 Movieclips used as rollovers 1.2.1.4 Movieclips used as text (text as art) 1.2.1.5 Buttons and Movieclips with button properties 1.2.1.6 Time Based Presentations or Animations	
FARM	1.2.2	1.2.2 **Text Equivalents for Children.** Descriptions should be programmed to match the assistive technology used by the target audience: 1.2.2.1 Self-voicing. Content targeted to early or non-assistive technology users (preK - 1st grade), should make use of self-voicing or system level audio.	
Equivalent Guidelines			

WCAG2.0	1.1.1	Non-text Content: All non-text content that is presented to the user has a text alternative that serves the equivalent purpose, except for the situations listed below. (Level A) • Controls, Input: If non-text content is a control or accepts user input, then it has a name that describes its purpose. • Time-Based Media: If non-text content is time-based media, then text alternatives at least provide descriptive identification of the non-text content. • Test: If non-text content is a test or exercise that would be invalid if presented in text, then text alternatives at least provide descriptive identification of the non-text content. • Sensory: If non-text content is primarily intended to create a specific sensory experience, then text alternatives at least provide descriptive identification of the non-text content. • CAPTCHA**:** If the purpose of non-text content is to confirm that content is being accessed by a person rather than a computer, then text alternatives that identify and describe the purpose of the non-text content are provided, and alternative forms of CAPTCHA using output modes for different types of sensory perception are provided to accommodate different disabilities. • Decoration, Formatting, Invisible: If non-text content is pure decoration, is used only for visual formatting, or is not presented to users, then it is implemented in a way that it can be ignored by assistive technology.[1] [1] Note: DoodleDoo does not recommend following this guideline. Recent surveys and usability studies point out that users of assistive technologies prefer to have images that describe the mood or feel of a web page described. http://www.webaim.org/projects/screenreadersurvey/	
WCAG2.0	1.2.3	Audio Description or Media Alternative (Prerecorded): An alternative for time-based media or audio description of the prerecorded video content is provided for synchronized media, except when the media is a media alternative for text and is clearly labeled as such. (Level A)	
WCAG2.0	1.2.5	Audio Description (Prerecorded): Audio description is provided for all prerecorded video content in synchronized media. (Level AA)	
WCAG2.0	1.2.7	Extended Audio Description (Prerecorded): Where pauses in foreground audio are insufficient to allow audio descriptions to convey the sense of the video, extended audio description is provided for all prerecorded video content in synchronized media. (Level AAA)	
WCAG2.0	1.2.8	Media Alternative (Prerecorded): An alternative for time-based media is provided for all prerecorded synchronized media and for all prerecorded video-only media. (Level AAA)	
SEC508	§ 1194.22 (a)	A text equivalent for every non-text element shall be provided (e.g., via "alt", "longdesc", or in element content).	
SEC508	§ 1194.22 (b)	Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.	
SEC508	§ 1194.24 (d)	All training and informational video and multimedia productions which support the agency's mission, regardless of format, that contain visual information necessary for the comprehension of the content, shall be audio described.	
ADOBE		Assign Text Equivalents. Provide text equivalents for graphic elements in Flash	

FADG		CS4 Professional. Provide names for graphic icons. Add text equivalents for gesturing animations that highlight an area of the page. When you use a feature such as Break Apart for text, be sure to provide a name or description. When a group of related graphic elements are used to convey a single idea, provide a single text equivalent and make the child objects inaccessible.	
ADOBE FADG		Expose State of Controls. Flash allows an infinite variety of controls. For all controls, it is important to provide the user with feedback on the control as it changes. In the simple example below, notice that once the button is pressed it changes from a play to a pause button. As the state of the button changes, the accessibility information for this button should be updated as well.	
Requirement 1.3 Differentiation | Ensure users can differentiate between sounds and objects.			
FARM	1.3.1	**Audio Interference.** Ensure that foreground and background audio do not interfere with each other and that background or other audio does not interfere with screen reader audio. Provide control over audio playback.	
FARM	1.3.2	**Soundeffects.** Ensure that users can distinguish between different interface sounds and sound effects. Add a sound guide where necessary.	
FARM	1.3.3	**Color.** Do not depend on color alone as a visual indicator.	
FARM	1.3.4	**Contrast.** Ensure that foreground and background color combinations provide sufficient contrast.	
FARM	1.3.5	**Scale.** Ensure that pixel fonts and text smaller than 12pt size can be resized. Do not disable the Context Menu (Right-Click Menu) zoom options in the Flash Player.	
FARM	1.3.1.6	**Rollover Buttons.** Ensure that buttons or movieclips with button properties that only have an onRollOver event are not read as buttons.	
Equivalent Guidelines			
WCAG2.0	1.3.3	Sensory Characteristics: Instructions provided for understanding and operating content do not rely solely on sensory characteristics of components such as shape, size, visual location, orientation, or sound. (Level A)	
WCAG2.0	1.4.1	Use of Color: Color is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element. (Level A)	
WCAG2.0	1.4.3	Contrast (Minimum): The visual presentation of text and images of text has a contrast ratio of at least 4.5:1, except for the following: (Level AA) • Large Text: Large-scale text and images of large-scale text have a contrast ratio of at least 3:1; • Incidental: Text or images of text that are part of an inactive user interface component, that are pure decoration, that are not visible to anyone, or that are part of a picture that contains significant other visual content, have no contrast requirement. • Logotypes: Text that is part of a logo or brand name has no minimum contrast requirement.	
WCAG2.0	1.4.6	Contrast (Enhanced): The visual presentation of text and images of text has a contrast ratio of at least 7:1, except for the following: (Level AAA)	

		• Large Text: Large-scale text and images of large-scale text have a contrast ratio of at least 4.5:1; • Incidental: Text or images of text that are part of an inactive user interface component, that are pure decoration, that are not visible to anyone, or that are part of a picture that contains significant other visual content, have no contrast requirement. • Logotypes: Text that is part of a logo or brand name has no minimum contrast requirement.	
WCAG2.0	1.4.4	Resize text: Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality. (Level AA)	
WCAG2.0	1.4.7	Low or No Background Audio: For prerecorded audio-only content that (1) contains primarily speech in the foreground, (2) is not an audio CAPTCHA or audio logo, and (3) is not vocalization intended to be primarily musical expression such as singing or rapping, at least one of the following is true: (Level AAA) • No Background: The audio does not contain background sounds. • Turn Off: The background sounds can be turned off. • 20 dB: The background sounds are at least 20 decibels lower than the foreground speech content, with the exception of occasional sounds that last for only one or two seconds. *Note:* Per the definition of "decibel," background sound that meets this requirement will be approximately four times quieter than the foreground speech content.	
WCAG2.0	1.4.8	Visual Presentation: For the visual presentation of blocks of text, a mechanism is available to achieve the following: (Level AAA) 5. Text can be resized without assistive technology up to 200 percent in a way that does not require the user to scroll horizontally to read a line of text on a full-screen window.	
SEC508	§ 1194.22 (c)	Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.	
ADOBE FADG		Use color wisely. Flash allows designers to use a wide variety of color combinations. When making color choices for a movie, the designer should not rely on color alone to convey information. For example, it would not be appropriate to provide an instruction that reads, "Click the green button to go forward and the red button to go back." At the same time, it is important to make sure that there is sufficient contrast between foreground and background colors to make content easily readable.	
ADOBE FADG		Enable control over audio playback. Music and audio that plays as the site loads presents a serious challenge to screen reader users. The audio from a movie can interfere with the end user's ability to hear the contents of a movie using a screen reader. As a result, it is important to make sure that the user has control over when music is played. The simplest strategy for handling audio playback is simply to allow the end user to control audio with a play and pause button.	
Requirement 1.4 Context | Provide contextual information about relationships between elements.			

FARM	1.4.1	**Screen Headings.** Each screen has a heading or title or other meaningful description of the screen's content and purpose. The user's location on each screen respective to other screens should be clear.	
FARM	1.4.2	**Organization.** Simplify navigation through Progressive Disclosure. For pages with involved structures and more than 20 selectable elements, provide a 'help' or 'about this page' section at the top of the page, that explains the page structure.	
FARM	1.4.3	**Link Destinations.** Clearly identify the target of each link.	
Equivalent Guidelines			
WCAG2.0	2.4.2	Page Titled: Web pages have titles that describe topic or purpose. (Level A)	
WCAG2.0	2.4.4	Link Purpose (In Context): The purpose of each link can be determined from the link text alone or from the link text together with its programmatically determined link context, except where the purpose of the link would be ambiguous to users in general. (Level A)	
WCAG2.0	2.4.6	Headings and Labels: Headings and labels describe topic or purpose. (Level AA)	
WCAG2.0	2.4.8	Location: Information about the user's location within a set of Web pages is available. (Level AAA)	
WCAG2.0	2.4.9	Link Purpose (Link Only): A mechanism is available to allow the purpose of each link to be identified from link text alone, except where the purpose of the link would be ambiguous to users in general. (Level AAA)	
WCAG2.0	2.4.10	Section Headings: Section headings are used to organize the content. (Level AAA) *Note 1:* "Heading" is used in its general sense and includes titles and other ways to add a heading to different types of content. *Note 2:* This success criterion covers sections within writing, not user interface components. User Interface components are covered under Success Criterion 4.1.2.	
SEC508	§ 1194.22 (i)	Frames shall be titled with text that facilitates frame identification and navigation.	
ADOBE FADG		Expose structure. Movies created with Flash can be complex in terms of layout, structure, and navigation. As a result, it can be very difficult for screen reader users to make sense of such a movie. As sites become more complex, try to add a description for the entire movie to help orient screen reader users to the structure of the site.	

Use Case 2. Mobility Impaired Users

Source	ID#	Success Criterion	Yes/No
Requirement 2.1 Tab Order			
FARM	2.1.1	**Keyboard Access.** All functionality of the content is operable through the keyboard alone.	

FARM	2.1.2	**Adjustable Timing.** Timing should be adjusted in time based interactions such that keyboard throughput can equal mouse based throughput.	
FARM	2.1.3	**Toggle Buttons.** All toggle buttons should maintain focus after selection.	
FARM	2.1.4	**Only Selectable Elements are Tabbable.** Movieclips used as graphics or animations that are not selectable should be taken out of the Tab Order.	
FARM	2.1.5	**Control Focus.** Focus is controlled in Flash by the `.focusrect` property and indicated by a default yellow focus rectangle called the focusrect. Control or re-set focus to favor the Action Sequence where possible. Note that the focus can be controlled for the Tab Order, but not for the Reading Order. Focus should remain on the screen at all times after a selection.	
Equivalent Guidelines			
WCAG2.0	2.1.1	Keyboard: All functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes, except where the underlying function requires input that depends on the path of the user's movement and not just the endpoints. (Level A) *Note 1:* This exception relates to the underlying function, not the input technique. For example, if using handwriting to enter text, the input technique (handwriting) requires path-dependent input but the underlying function (text input) does not. *Note 2:* This does not forbid and should not discourage providing mouse input or other input methods in addition to keyboard operation.	
WCAG2.0	2.1.2	No Keyboard Trap: If keyboard focus can be moved to a component of the page using a keyboard interface, then focus can be moved away from that component using only a keyboard interface, and, if it requires more than unmodified arrow or tab keys or other standard exit methods, the user is advised of the method for moving focus away. (Level A) *Note:* Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion.	
WCAG2.0	2.1.3	Keyboard (No Exception): All functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes. (Level AAA)	
WCAG2.0	2.2.1	Timing Adjustable: For each time limit that is set by the content, at least one of the following is true: (Level A) • Turn off: The user is allowed to turn off the time limit before encountering it; or • Adjust: The user is allowed to adjust the time limit before encountering it over a wide range that is at least ten times the length of the default setting; or • Extend: The user is warned before time expires and given at least 20 seconds to extend the time limit with a simple action (for example, "press the space bar"), and the user is allowed to extend the time limit at least ten times; or • Real-time Exception: The time limit is a required part of a real-time event (for example, an auction), and no alternative to the time limit is possible; or • Essential Exception: The time limit is essential and extending it would invalidate the activity; or	

		• 20 Hour Exception: The time limit is longer than 20 hours.	
WCAG2.0	2.4.3	Focus Order: If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability. (Level A)	
WCAG2.0	3.2.1	On Focus: When any component receives focus, it does not initiate a change of context. (Level A)	
SEC508	§ 1194.21 (a)	When software is designed to run on a system that has a keyboard, product functions shall be executable from a keyboard where the function itself or the result of performing a function can be discerned textually.	
SEC508	§ 1194.21 (b)	Applications shall not disrupt or disable activated features of other products that are identified as accessibility features, where those features are developed and documented according to industry standards. Applications also shall not disrupt or disable activated features of any operating system that are identified as accessibility features where the application programming interface for those accessibility features has been documented by the manufacturer of the operating system and is available to the product developer.	
SEC508	§ 1194.22 (p)	When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.	
ADOBE FADG		Facilitate keyboard access to all controls. When adding buttons and other controls to movies, make sure that users can navigate through your movie effectively using only the keyboard. Keep in mind that applications need to be tested both with and without a screen reader. To facilitate keyboard access, try to keep scripts within frames as opposed to attaching them directly to objects. Also, avoid using empty movie clips as buttons. These "hit areas" are not recognized by screen readers.	
Requirement 2.2 Differentiation			
FARM	2.2.1	**Visible Focus.** Selectable elements should have hitareas that are large enough to accommodate the focusrect. It is not recommended to turn the focusrect off. If the yellow focusrect is turned off, all selectable elements should have clear rollover states.	
Equivalent Guidelines			
WCAG2.0	2.4.7	Focus Visible: Any keyboard operable user interface has a mode of operation where the keyboard focus indicator is visible. (Level AA)	
SEC508	§ 1194.21 (c)	A well-defined on-screen indication of the current focus shall be provided that moves among interactive interface elements as the input focus changes. The focus shall be programmatically exposed so that assistive technology can track focus and focus changes.	
Requirement 2.3 Keyboard Shortcuts			
FARM	2.3.1	**Keyboard Shortcuts.** Keyboard Shortcuts are recommended when a) there is repeatable and consistent navigation and/or b) there are more than 30 selectable elements on screen.	
FARM	2.3.2	**Single Keys.** All Access Keys or Keyboard Shortcuts are activated by single and sequential or mnemonic keystrokes.	
FARM	2.3.3	**Multi-Modal.** Keyboard Shortcuts are revealed to both visually impaired, and mobility impaired users.	

FARM	2.3.4	**Interference.** No keyboard shortcuts should interfere with system-level operations. The Up and Down arrow keys should be reserved for navigation.	
FARM	2.3.5	**Focus.** Give visible focus to buttons or movieclips with button properties, after having been selected by a keyboard shortcut.	
Equivalent Guidelines			
WCAG2.0	2.4.1	Bypass Blocks: A mechanism is available to bypass blocks of content that are repeated on multiple Web pages. (Level A)	
SEC508	§ 1194.22 (o)	A method shall be provided that permits users to skip repetitive navigation links.	
SEC508	§ 1194.21 (b)	Applications shall not disrupt or disable activated features of other products that are identified as accessibility features, where those features are developed and documented according to industry standards. Applications also shall not disrupt or disable activated features of any operating system that are identified as accessibility features where the application programming interface for those accessibility features has been documented by the manufacturer of the operating system and is available to the product developer.	
ADOBE FADG		Facilitate keyboard access to all controls. Add keyboard shortcuts to commonly used buttons to promote access.	

Use Case 3. Deaf or Hearing Impaired Users

Source	ID#	Success Criterion	Yes/No
Requirement 3.1 Captions			
FARM	3.1.1	**Text Captions.** Provide Synchronized Captions for all audio and soundeffects, except for button clicks and other functional interface sounds.	
FARM	3.1.2	**Captioning for Children.** For text-based captions targeted to children, match caption speed and content display to the average Reading Rate of the target audience: 3.1.2.1 **Signed Captions**. Non- and Early Readers (preK grade). Captions have to be signed. 3.1.2.2 **Edited or Paced captions**. Early and Transitional Readers (1^{st} – 3^{rd} grade). The content should be segmented, so that there is enough time to read the captions, or the captions should be edited to match reading abilities. present simplified language and shorter sentences at a slower rate. Primary fonts should be used. 3.1.2.3 **Paced Captions.** Moderate Readers (4^{th} – 10^{th} grade). Captioning speed should be held between 60 wpm - 180 wpm.	
FARM	3.1.3	**Adaptive Captions.** Provide Synchronized Captions in the form of sign language in cases where text-based captions do not satisfy learning objectives (such as in spelling and language lessons).	
Equivalent Guidelines			
WCAG2.0	1.2.2	Captions (Prerecorded): Captions are provided for all prerecorded audio content in synchronized media, except when the media is a media alternative for text and	

		is clearly labeled as such. (Level A)	
WCAG2.0	1.2.6	Sign Language (Prerecorded): Sign language interpretation is provided for all prerecorded audio content in synchronized media. (Level AAA)	
SEC508	§ 1194.22 (b)	Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.	
SEC508	§ 1194.24 (c)	All training and informational video and multimedia productions which support the agency's mission, regardless of format, that contain speech or other audio information necessary for the comprehension of the content, shall be open or closed captioned.	
ADOBE FADG		Provide Captions. Flash CS4 Professional makes delivering audio content simple, and now delivering closed captions for users who are deaf or hard of hearing is easier than ever. Flash CS4 Professional offers a new component to display captions that are either contained in a World Wide Web Consortium (W3C) Timed Text XML file (DFXP) or integrated with the FLV file as cue points.	

Use Case 4. Cognitive Impaired Users

Source	ID#	Success Criterion	Yes/No
Requirement 4.1 Eliminate Distractions | Eliminate distractions of various elements in the content.			
FARM	4.1.1	**Readability.** Check for ease of reading and make sure all content has been written at the appropriate target age level.	
FARM	4.1.2	**Avoid Blinking, Flashing and Flickering.** Avoid any Blink, Flash or Flicker for any notification purposes. For any other purposes, keep to allowed limit. (See Glossary for definitions).	
FARM	4.1.3	**Settle Animation.** Make sure that all animated elements, such as text fields and animations, either settle after three (3) seconds or are provided with playback controls. Text should not be animated other than for transitional purposes, not to exceed three (3) seconds.	
FARM	4.1.4	**Jarring Audio or Soundeffects.** No audio or soundeffects should distract from the main content.	
Equivalent Guidelines			
WCAG2.0	2.2.2	Pause, Stop, Hide: For moving, blinking, scrolling, or auto-updating information, all of the following are true: (Level A) • Moving, blinking, scrolling: For any moving, blinking or scrolling information that (1) starts automatically, (2) lasts more than five seconds, and (3) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it unless the movement, blinking, or scrolling is part of an activity where it is essential; and • Auto-updating: For any auto-updating information that (1) starts automatically and (2) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it or to control the frequency of the update unless the auto-updating is part of an activity where it is essential. *Note 1:* For requirements related to flickering or flashing content, refer to Guideline 2.3.	

		Note 2: Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion. See Conformance Requirement 5: Non-Interference. *Note 3:* Content that is updated periodically by software or that is streamed to the user agent is not required to preserve or present information that is generated or received between the initiation of the pause and resuming presentation, as this may not be technically possible, and in many situations could be misleading to do so. *Note 4:* An animation that occurs as part of a preload phase or similar situation can be considered essential if interaction cannot occur during that phase for all users and if not indicating progress could confuse users or cause them to think that content was frozen or broken.	
WCAG2.0	2.3.1	Three Flashes or Below Threshold: Web pages do not contain anything that flashes more than three times in any one second period, or the flash is below the general flash and red flash thresholds. (Level A) *Note:* Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion.	
WCAG2.0	2.3.2	Three Flashes: Web pages do not contain anything that flashes more than three times in any one second period. (Level AAA)	
WCAG2.0	3.1.3	Unusual Words: A mechanism is available for identifying specific definitions of words or phrases used in an unusual or restricted way, including idioms and jargon. (Level AAA)	
WCAG2.0	3.1.5	Reading Level: When text requires reading ability more advanced than the lower secondary education level after removal of proper names and titles, supplemental content, or a version that does not require reading ability more advanced than the lower secondary education level, is available. (Level AAA)	
SEC508	§ 1194.21 (k)	Software shall not use flashing or blinking text, objects, or other elements having a flash or blink frequency greater than 2 Hz and lower than 55 Hz.	
SEC508	§ 1194.21 (j)	Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.	
ADOBE FADG		Animation. Make looping elements inaccessible. Movies that never stop moving cause screen readers to refresh frequently. Even in cases where the movies are at the bottom of a page, the screen reader can interpret motion as an update to the page and return to the top and start reading again. For this reason, child objects of movie clips or entire movies should be made inaccessible. Allow users to control motion. Try not to present information in your movie that remains on the screen for only a short time. Screen readers may have a difficult time keeping up with quick changes in movies. You can resolve this type of problem by adding Next buttons that control movement.	
Requirement 4.2 Clarity | Provide clearness in perception and understanding of the content.			
FARM	4.2.1	**Consistency.** Provide a consistent structure and navigation.	
FARM	4.2.2	**Simplicity.** Simplify navigation and manage complexity. This will benefit all users, especially cognitive impaired and screen reader users.	

FARM	4.2.3	**Perceptual Organization.** Ensure that the elements of a screen are structured and that similar elements are grouped together.	
FARM	4.2.4	**Clickability.** Provide a consistent button treatment. A lack of Clickability Affordance can cause users to overlook features.	
Equivalent Guidelines			
WCAG2.0	3.2.3	Consistent Navigation: Navigational mechanisms that are repeated on multiple Web pages within a set of Web pages occur in the same relative order each time they are repeated, unless a change is initiated by the user. (Level AA)	
WCAG2.0	3.2.4	Consistent Identification: Components that have the same functionality within a set of Web pages are identified consistently. (Level AA)	
SEC508	§ 1194.21 (e)	When bitmap images are used to identify controls, status indicators, or other programmatic elements, the meaning assigned to those images shall be consistent throughout an application's performance.	
ADOBE FADG		Progressive Disclosure. One of the greatest challenges for screen reader and keyboard users in navigating a complex site is moving from the top of the screen to the content they are trying to access. Sites with numerous controls or links can result in a time - consuming and tedious experience for the user. As result, the best user interface for someone who relies on a screen reader or a keyboard is one that is very narrow, offering a limited number of options at the top and increasingly more as the user drills down.	