Federal Aviation Administration

Web-Based Internet and Intranet Information and Application

Introduction

- **Focus on the Section 508 1194.22 Web Based Internet and Intranet technical standards**
- **Present FAA Web Accessibility information and resources**
- **Provide FAA web masters and web developers with the 1194.22 specific coding techniques**

FAA's Efforts to Ensure Web Accessibility

FAA's commitment to ensuring accessible websites for all employees with disabilities:

- Secretary Mineta's Electronic and Information Technology Policy Statement.

- Daniel Mehan's Memorandum to the Management Board.

Individuals with Disabilities

Visual disabilities

- Blindness (complete loss of sight)
- Low Vision and Color blindness

Hearing disabilities

- Deaf (complete loss of hearing)
- Hard of hearing, High/low frequency hearing loss

Mobility disabilities

- Repetitive Stress Injuries (RSI), Paralysis
- Neurological Disorders, Spinal Cord Injuries, Loss of Limbs or Digits

Web Access Barriers for Individuals are visually impaired

- Complex Science and Math Notation, Images and Image Maps
- Multimedia (Sound & Video), Frames, Forms, Tables
- Navigation, Java Scripts and Programming Code
- Web accessibility conformance is predicated on browser recognition and implementation of transitional HTML 4.01

AT for Visual Impairments

- Screen readers programs and Braille displays
- Screen magnification programs and High (or different) contrast settings (e.g., yellow text on a black background)

Web Access Barriers for Individuals who are hearing impaired

- Multimedia features including sound and video clips
- Error, or information, system or application messages displayed through audible cues

AT for Auditory Impairments

- Assistive technology devices for persons who are deaf or hard of hearing (e.g., hearing aids) do not impact Web design significantly
- Provide textual captioning and visual cues

Web Access Barriers for Individuals who are mobility impaired

- Manipulation of input devices, including the keyboard and mouse
- Difficulty holding down multiple keyboard keys simultaneously

AT for Mobility Impairments

- Alternative and adaptive keyboards and mice
- Breath control devices
- Head pointing/tracking devices
- On screen keyboards and mouse emulation programs
- Voice input/recognition

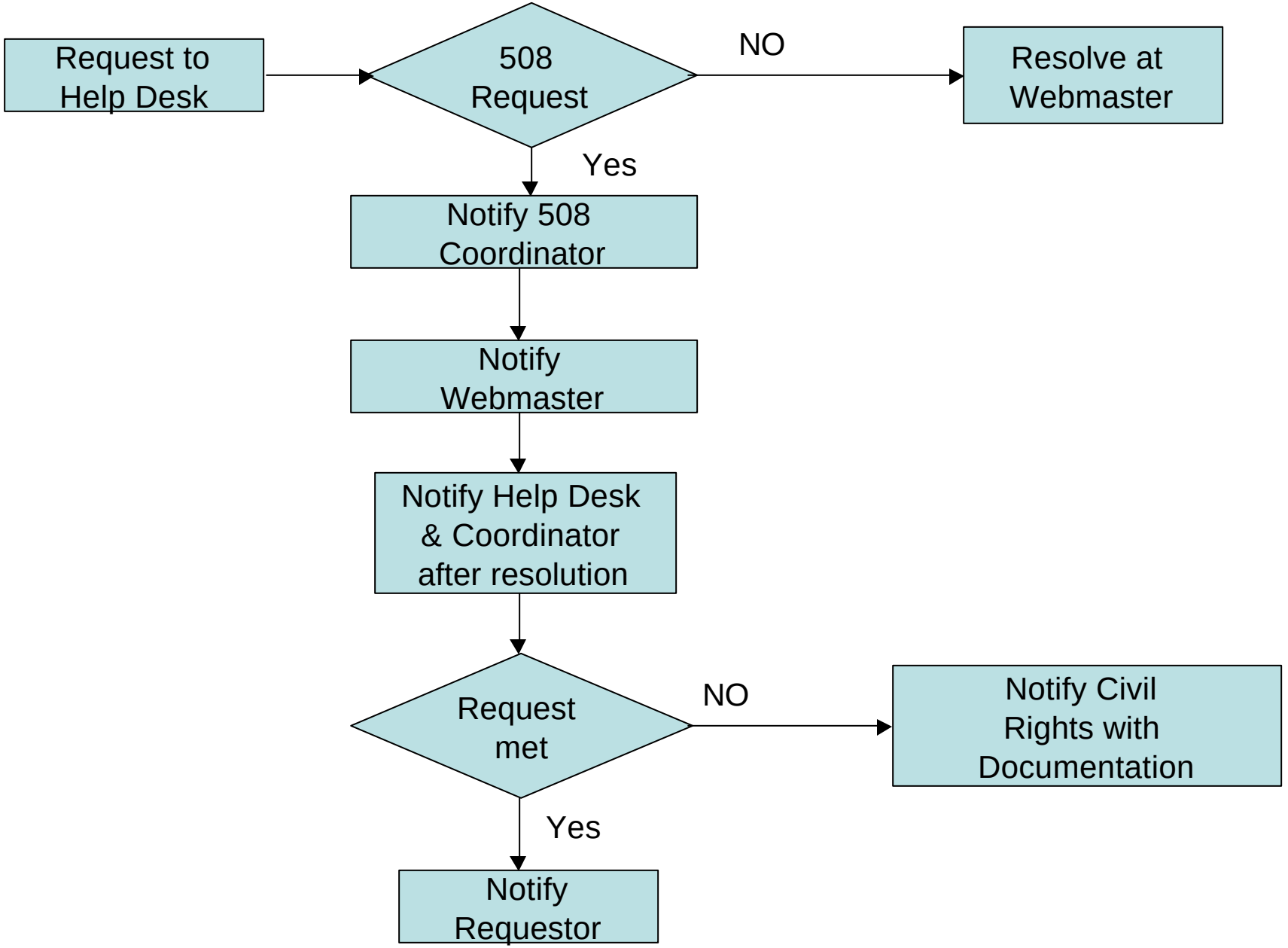
5 Steps to Section 508 Compliance

- Review GSA'S 508Unviverse, **http://www.section508.gov/index.cfm?FuseAction=Content&ID=5**
- Create a central repository for Section 508 information and develop action plan
- Acquire and Apply Technical Knowledge, Guidance And Resources
- Test Your Web Pages
- Provide Feedback to Section 508 Team

Section 508 Web Action Plan

- Locate all websites
- Develop strategy to review web sites in database
- Review remaining web sites in database for 508 compliance
- Conduct web trend analysis for top 20 Internet and Intranet web sites
- Conduct periodic review of FAA.gov to ensure 508 compliance

Section 508 Help Desk
Complaint Procedure for FAA Web Sites
(Process Coordinated with Office of Civil Rights)


Request to Help Desk
508 Request
NO
Resolve at Webmaster
Yes
Notify 508 Coordinator
Notify Webmaster
Notify Help Desk & Coordinator after resolution
Request met
NO
Notify Civil Rights with Documentation
Yes
Notify Requestor

Web-based Intranet and Internet Information and Applications (1194.22)

Web-based Intranet and Internet Information and Applications

- §1194.22(a): Text Descriptions
- §1194.22(b): Captioning & Descriptioning
- §1194.22(c): Color Coding
- §1194.22(d): Style Independence
- §1194.22(e): Redundant Links
- §1194.22(f): Client Side Maps
- §1194.22(g): Table Headers

Web-based Intranet and Internet Information and Applications

- §1194.22(i): Frame Titles
- §1194.22(j): Flicker Rate
- §1194.22(k): Text Alternative
- §1194.22(l): Script Alternative
- §1194.22(m): Software Accessibility
- §1194.22(n): Electronic Forms
- §1194.22(o): Navigation Links
- §1194.22(p): Control of Timed Responses

Background

- Section 508 is technology centric
- Section 508 is not about accessibility or usability, that is W3C
- What is the current HTML standard for designing websites?
  - XHTML and/or HTML 4.01
  - At the very least, you should be coding to HTML 4.01

Background

- How long has HTML 4.01 been available?
  - December 24, 1999
- If you have been coding to HTML 4.01, then Section 508 would not be an issue for your web pages
- If you had been coding to HTML 3.2 then you didn't have to add ALT attributes to your images and objects

1194.22(a): Text Descriptions

Definition

A text equivalent for every non-text element shall be provided (e.g., via "alt", "longdesc", or in element content)

Non-Text Elements

- What is your biggest non-text element in your web page?
  - Images: No
  - Applets: No
  - Tables: No
  - Forms: No
- Your biggest non-text element is:

Non-Text Elements (cont)

- The Web Page
- Why?
  - Your source code is text; the information in the browser is rendered from that code
  - The browser, or the server, renders the source code to a code format (HTML)
  - That code format (HTML) is rendered to a readable format for the user

Non-Text Elements (cont)

- Why is this important?
  - Browsers only understand HTML
  - The Screen or Braille reader only understands the HTML that is produced
    - The Screen or Braille reader requires some additional coding that are included in HTML 4.01 but not in HTML 3.2
    - Screen or Braille readers have their own plug-ins and may require alternative means for equivalent information

Non-Text Elements (cont)

- Conclusion
  - Your biggest non-text element is the web page and it must be rendered to a text equivalent or provide an alternative means of access to the information
  - Sub-paragraphs (a)-(p) describe the elements that need to be addressed and some alternative means of providing equivalent information

Non-Text Elements (cont)

- What are the Non-Text Elements?
  - Images
  - Objects
  - Applets
  - Documents in Proprietary Formats
    - PDF
    - Word, PowerPoint, Excel, etc
    - ZIP

Images

- What should be the equivalent information for the image below?

Images (cont)

- First: ALT attribute is required because it is a non-text element
- Second: Does the image convey information?
  - Yes
- Is this sufficient?
  - Alt="well.gif (832 bytes)"
  - Do you know what is a "well.gif"?

Images (cont)

- How do you describe the information in an image?
  - You use the ALT attribute:
  - Code:
    - <img src="wel.gif" alt="Welcome to FAA.gov">

Images (cont)

- Do I need to describe everything about the image?
  - What is the main information:
    - **Welcome to FAA.gov,**

      that is the minimum
  - Do I need to describe the plane and sky?
    - No, it doesn't convey any additional information

Images (cont)

– The level of description should convey the meaning of the image. Under W3C, you would need to describe everything.

Images (cont)

- Now, what is the description for the image below?

Images (cont)

- How about the name of the image: Well.gif
  - The screenreader will read “graphic well.gif”.
  - Does that convey the information from the image? No, so don’t use the name of the image as the descriptive text.
- How about what the image says “Welcome to FAA.gov”
  - The screenreader will read “graphic Welcome to FAA. gov”. Which tells me, I’m at the FAA web site

Images (cont)

- Do I need to describe the plane and sky?
  - In this case, the answer is “No” because it is not pertinent to the information convey in the image.
- What about images that do not have text in the image?
  - Non-informational images like bullets, spacers, arrow, etc, will be discussed later.

Images (cont)

- Image that does not have text
  - Below is an example of an image without text (not arrows, bullets, spacer, etc)

Images (cont)

- What should be the text?
  - Does the image convey information?
    - If an image is used (other than spacer, bullet, arrows, etc) on a web page, then assume that it is being used to convey some kind of information
    - Ask the content provider for the text description of the image and use that text. If the content provider is not sure, then provide meaningful text

Images (cont)

- The image is being used to convey some kind of information.
  - You could use this: “Three people standing in a hangar either waiting or looking at parked airplanes on the tarmac. The people look to be professionally dressed and two people (one man and one woman) are each carrying a briefcase. The third has carryall on rollers and appears to be a woman. There are two express passenger jets in picture. The sky has a brown tint to it.”

Images (cont)

- The other option: “Three people waiting for an airplane in a hangar”. This conveys the same basic information as the previous description.

– How much is too much or too little text description?
  - Rule of thumb: It shouldn’t be more that 50 –70 characters
  - Ask the image content provider to give you the text or meaning of the image
  - Basically, it gets down to a judgment call and experience

Images (cont)

- Logos or images with text
  - Provide all the pertinent information of the image
  - Example:

Images (cont)

- Is alt="FirstGov" sufficient?
  - If this was your first time seeing the image, do you know what "FirstGov" is?
    - Probably the answer is "No"
  - What does a visual reader see?
    - FIRSTGOV.gov, The U.S. governments official web portal
  - Should this information be share equally with people using assistive technology or who have low vision?

Images (cont)

- Common Issue
  - There is a tendency not to convey all textual information in a image to people using assistive technology.
  - Extend the same courtesy to people using assistive technology as you do the visual users.
- Solution
  - Allow the user to determine what is relevant or not. Provide the relevant information.

Images (cont)

- Quick Review:
- What's wrong with this code?
  - <img src="images/balloon.gif" border="0" width="50" length="50">
- Missing ALT attribute
- Can you guess what is the text description?
  - If you can't, then how can other users?

Images (cont)

- Corrected Code
  - <img src="images/balloon.gif" border="0" width="50" height="50" alt="5 hot air balloons with 1 balloon shaped like a duck and rest with multiple colors">
- Can you visualize the image without actually seeing it?
- Why didn't I describe the colors?

Images (cont)

- People who are blind from birth don't perceive color the way people who are not blind?
  - Outside the physics, describe the color RED.
  - What does red face mean?
    - A person is embarrassed
    - A person is very angry
    - A person just finished exercising

Images (cont)

- Color (outside the physics) is conceptual in its use to describe things. People who are blind live in the same environment and learn the same concepts. Do not decide what is relevant information, describe the image and allow the user to decide what is relevant.
- The reason I use “multiple colors” is that it what be a very long description to describe every hot air balloon and each individual color.

Images (cont)

- Non-Informational images
  - Bullets, Arrows, Spacers, etc
  - Do not require descriptive text
  - Why:
    - If the bullet, arrow, spacer, etc. is not necessary to understand the page content
    - Using W3C Recommendation: **13.8 How to specify alternate text Attribute definitions**
      “. . . (next page)

Images (cont)

- Do not specify irrelevant alternate text when including images intended to format a page, for instance, alt="red ball" would be inappropriate for an image that adds a red ball for decorating a heading or paragraph. In such cases, the alternate text should be the empty string (""). Authors are in any case advised to avoid using images to format pages; style sheets should be used instead.
- Do not specify meaningless alternate text (e.g., "dummy text"). Not only will this frustrate users, it will slow down user agents that must convert text to speech or Braille output. Implementers should consult the section on accessibility for information about how to handle cases of omitted alternate text."

Images (cont)

- How do I code?
  - Alt=“” The “” tells the assistive technology device to skip over the image.
  - Do not use Alt=“[space]”. Now you will have little boxes popping up over your web page and the assistive technology device may say “space”
- When does an Arrow convey content information?

Images (cont)

- When it is not used for visual eye-candy
- Example: You have an article on the web page that says “Five Techniques for Cyber Security”. Instead of doing 1,2,3,4,and 5, you decided to use Arrows to highlight each technique. At this point, the Arrows are now taking the place of 1,2,3,4, and 5. The Arrow’s “ALT” attribute should say, at the very least, alt=“1”, alt=“2”, etc for each technique. If I had put 1,2,3,4 and 5 for each technique and used the Arrows, the Arrows are now visual eye-candy and should have alt=“”.

Images (cont)

- What is the D-Link?
  - The D-Link, [D], is a generic term meaning "descriptive link"
- What is it used for?
  - If an image requires additional description, then this provides a link to a descriptive page
  - For example: A financial graph could be explained in 255 characters but is it usable?

Images (cont)

- Not to a person with a screen or Braille reader. The reason is that the “alt” attribute is a tool tip for web pages. The screen or Braille reader will read all the text without stopping. The ‘descriptive’ page will allow the user to review information by navigating the page.

- How does it work?
  - First, do not put [D], this is generic term. Put a descriptive text as to what the page is about (i.e. FY2001 Info)

Images (cont)

- Second, don't forget that the image still needs an "alt" attribute for two reasons:
  - 1. Describe the image
  - 2. If using a [D] then tell the person where this link is located on the web page

Images (cont)

- Common Errors
  - Multiple or single [D] instead of text description.
    - The screen reader will say “link D”. The user will not understand where “link D” will take the user.
  - Forget to create the descriptive page.
  - Forget to tell the user which link to use.

Applets, Objects, Embedded

- Requires ALT attribute
  - ALT attribute should contain equivalent information
  - If equivalent information cannot be conveyed?
    - Use the ALT attribute to convey where the information is located. DO NOT USE a URL address.

    (i.e. information at http://www.xyz.gov/news/pr/2003/news.htm)
    - Provide text link on the page to the information

    (i.e. information at “news link”)

Applets, Objects, Embed (cont)

- Typical coding
  - <applet alt="Java menu, text links can be found at bottom of page">
- What's wrong with this?
  - Some text readers cannot read the ALT attribute inside the Applet tag.

Applets, Objects, Embed (cont)

- Preferred coding
  - <applet alt="Java menu, text links can be found at bottom of page">
    Java menu, text links can be found at bottom of page
    <param>
  - Place text between Applet and the first Param tag. It does not affect the Applet but is readable by most readers.

5 Simple Rules for Non-Text Elements

- 1. Images that provide content or navigation are required to have descriptive text (via alt attribute)
- 2. Images that do not provide content or navigation (arrow, bullets, spacer, etc) are required to have the alt attribute (alt=“”)

5 Simple Rules for Non-Text Elements (cont)

- 3. Applets, Objects, and Embedded elements require an ALT attribute
- 4. Proprietary formats, (i.e. Word, PDF, Excel, etc), are required to be Section 508 compliant or an alternative format (HTML, TXT, RTF) must be provided.
- 5. D-Links, [D], should be descriptive text links.

1194.22(b): Multimedia Presentations

Definition

- Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.

Multimedia Presentations (cont)

- Issue
  - User with hearing difficulties may not fully understand spoken text in a visual presntation
- Solution
  - The audio portion of a multimedia production must be captioned, as required in provision (a), the captioning must be synchronized with the audio

Multimedia Presentations (cont)

- Audio files
  - Audio files are not a multimedia presentation but a non-text element, 1194.22(a).
  - A transcript must be available
- Slide Show (silent)
  - Is not a multimedia presentation , but does require text alternatives to be associated with the graphics

1194.22(c): Color

Definition

- Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.

Color (cont)

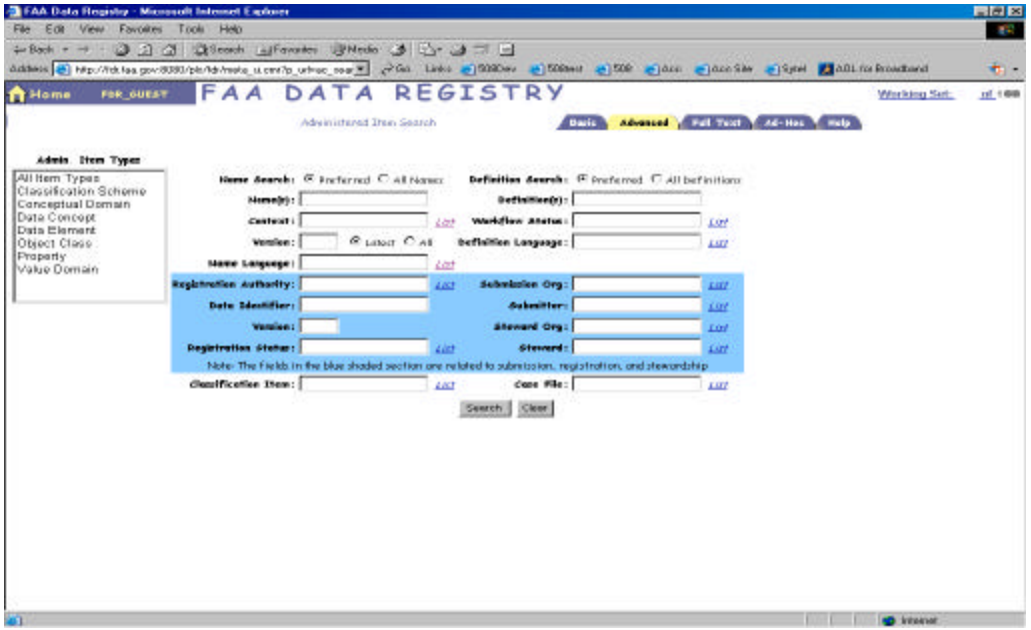
- Issue:
  - When colors are used as the sole method for identifying screen elements or controls, persons who are color blind as well as those people who are blind or have low vision may find the web page unusable.

Color (cont)

- Example 1
  - Form buttons using color to convey an action

Color (cont)

- Example 2:
  - Search Form states:
    - Note: The fields in the blue shaded section are related to submission, registration, and stewardship



Color (cont)

- The provision does not prohibit the use of color to enhance identification of important features.
- Requires that some other method of identification, such as text labels, must be combined with the use of color.
- Avoid using color to indicate emphasized text, and also the use of color to indicate an action.

Color (cont)

- Hyperlinks
  - Visited links are normally red, conveying to the use information that a web page has been visited
    - Not a Section 508 issue because the user has the capability to reconfigure the default color for visited links

1194.22(d): Document Readability

Definition

- Documents shall be organized so they are readable without requiring an associated style sheet.

Document

- Issue
  - Designers set up pages that may override user-defined style sheets
- Reason:
  - Users may create their own style sheets reflecting their specific viewing preferences.

Document (cont)

- Solution
  - the "safest" and most useful form of style sheets are "external" style sheets, in which the style rules are set up in a separate file
  - Example: <link rel=stylesheet type="text / css" href="section508.css>

Document (cont)

- Common issue
  - A user comes to a web page using their own style sheet. When they view the web page their style sheet is ignored.
  - Is this a Section 508 violation?

Document (cont)

- Why is this?
  - More than likely the user is using <p>, <table>, <b>, <ul>, <li>, <ol>, <body>, etc.
  - Web designers use ‘class’ and ‘id’ to write their style sheets
  - ‘Class’ and ‘id’ overwrite the <p>, <table> , etc tags

Document (cont)

- Solution
  - The user must do the following:
    - Using the accessibility features of their browser
    - Turn off font styles and sizes
    - Activate their style sheet and then their style sheet will work
  - The web designer must not set “priority” to ‘important’. It is best not to set any “priority” in a style sheet

1194.22(e)
Server Side Image Maps

Server Side Images (cont)

- Definition
  - Redundant text links shall be provided for each active region of a server-side image map.

Server Side Images (cont)

- Description
  - An image map where locations on the image specify the coordinates within the image. The selection of the link or URL must be deciphered by the computer serving the web page instead of the client.

Server Side Images (cont)

- Issues
  - Browsers and readers cannot indicate to the user the URL that will be followed when a region of the map is activated
  - Textual information is not available to the image.

Server Side Images (cont)

- Solution
  - Redundant text links are necessary to provide access to the page for anyone not able to see or accurately click on the map.
  - Check for ‘ismap' (server-side) as opposed to ‘usemap' (client-side) attributes

1194.22(f)
Client Side Image Maps

Client Side Images (cont)

- Definition
  - Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.

Client Side Images (cont)

- Description
  - An image map, where each "active region" in a picture can be assigned its own "link" (URL) that specifies what web page will be retrieved when that portion of the picture is selected. HTML allows each active region to have its own alternative text.

Client Side Images (cont)

- Issues
  - Textual information is not provided for separate active areas
  - Active areas have provided textual information in the image but the image map itself is missing an ALT attribute.

Client Side Images (cont)

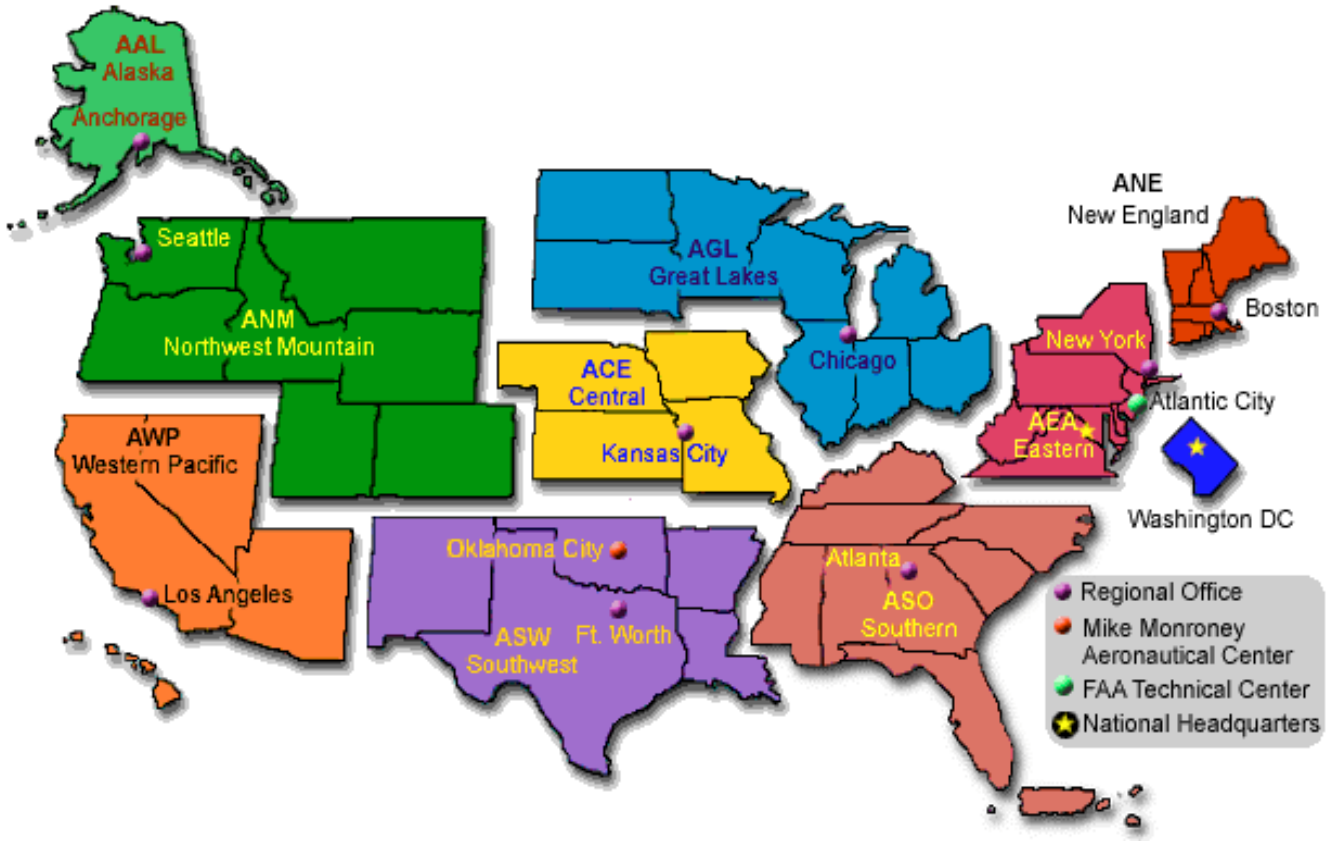
- Solution
  - 4 step process
    - 1. Identify an image using the <img> tag. To identify it as a map, use the "usemap" attribute.
    - 2. The <MAP> tag is a container tag that includes various <AREA> tags that are used to identify specific portions of the image.
    - 3.Use the "ALT" attribute to provide a text description of the area inside each <AREA> tag.
    - 4. Check to make sure the ALT description reflects the map

Client Side Images (cont)

- Code Example:
  - <img src="navbar.gif" alt="map description" border="0" usemap="#Map">
    <map name="Map">
    <area shape="rect" coords="0,2,64,19" href="general.html" alt="information about us" >
    <area shape="rect" coords="65,2,166,20" href="jobs.html" alt="job opportunities" >
    <area shape="rect" coords="167,2,212,19" href="faq.html" alt="Frequently Asked Questions" >
    <area shape="rect" coords="214,2,318,21" href="location.html" alt="How to find us" >
    <area shape="rect" coords="319,2,399,23" href="contact.html" alt="How to contact us" >
    </map>

Client Side Images (cont)

– Example:



Client Side Images (cont)

- Web Page Example (cont)
  - This image meets the technical requirements of Section 508 1194.22(f).
  - ALT attributes all have the name of the region and the abbreviations of the state.

Client Side Images (cont)

- Question: What is the regional office for ASO (Southern) and where it is located?
  - The information in the ALT attributes is the name of the region and the states in that region.
  - As you can determine, the location of the regional office is not available.

Client Side Images (cont)

- Question: Is the web page with the map image Section 508 compliant?
  - You ran a Section 508 Checker and it says you are compliant
  - You mouse over the areas and the ALT attributes pop-up showing that they are visible
  - The rule says to provide an alternative description for Images and Active Areas, which you have done

Client Side Images (cont)

- Answer
  - Like a few things in Section 508 it is not that clear cut.
    - If the information about the regional office and location is somewhere on the web page then it is Section 508 compliant
    - If the information is not on the web page, then it is not compliant and must be corrected

Client Side Images (cont)

- Reason:
  - The web page is a non-text element. This means that all information must be conveyed in equivalent text on the web page.
  - The image might be unusable if all the information in the map is conveyed in the ALT attributes. The additional information could be placed on the web page below the image map.

Client Side Images (cont)

- Common Errors:
  - Forgetting to put the ALT attribute for the image when it is initially declared a “#usemap”
  - Not using the ALT attribute
  - Not providing enough information to make the map equivalent between a visual user and a user with assistive technology

1194.22(g) & (h) Data Tables

Definition

- 1194.22(g): Row and column headers shall be identified for data tables.
- 1194.22(h): Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.

Terms

- Definitions: HTML 4.01 11.2.6
- Table: Defines a table structure
- <TR> Defines a row
- <TH> Defines a table header
- <TD> Defines a table data cell
- <Caption> Title of a table

Terms (cont)

- Summary: summarizes purpose or content of the table
- Scope: specifies the set of data cells for which the current header cell provides header information
  - Row: The current cell provides header information for the rest of the row that contains it
  - Col: The current cell provides header information for the rest of the column that contains it

Table Structure

- Typical table design
  - <table cellpadding="0" cellspacing="0" border="0" width="100%">
    - <tr>
      - <td></td>
      - <td></td>
    - </tr>
  - </table>

Table Structure (cont)

- Was that a data or a layout table?

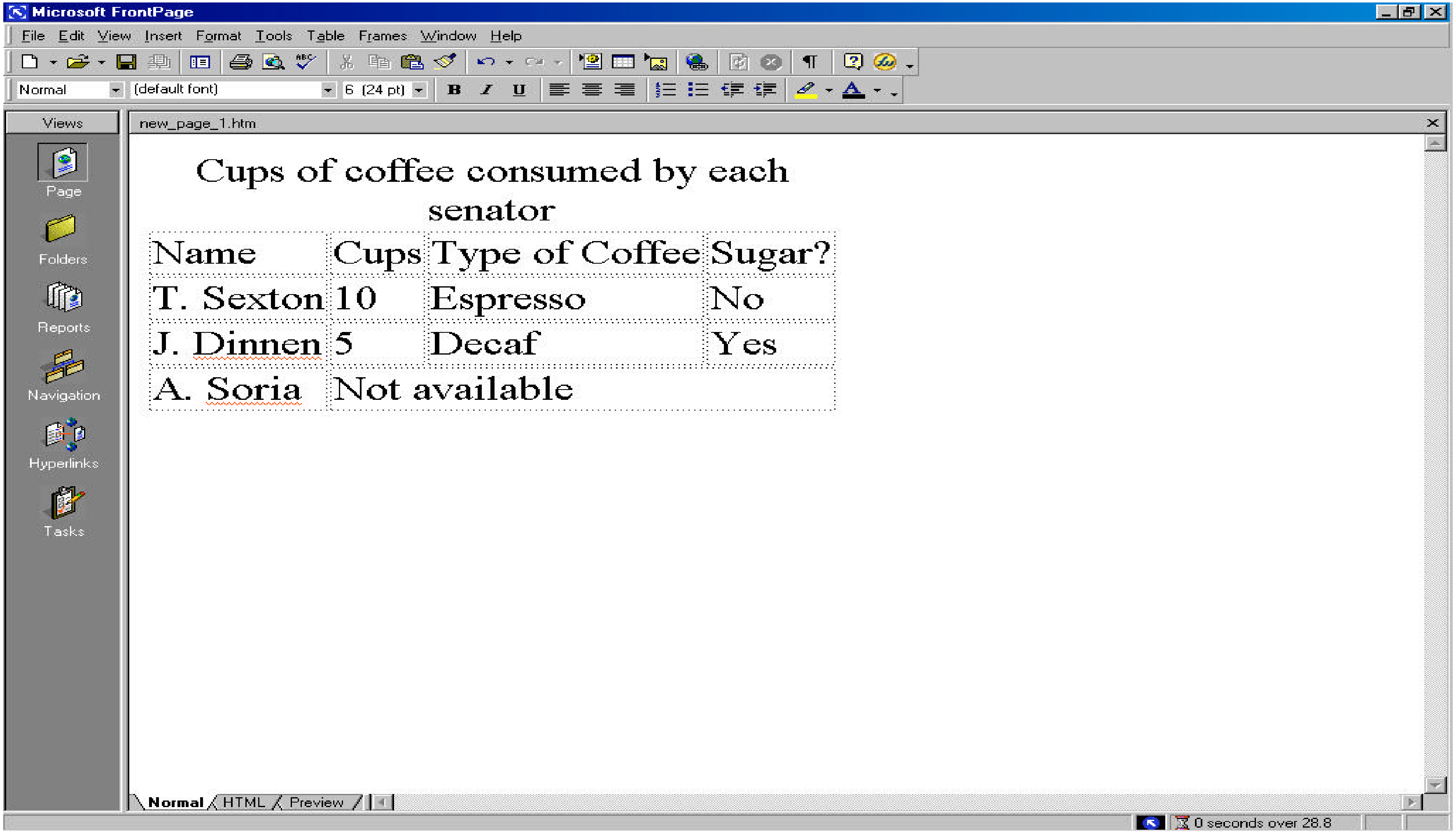
DON’T KNOW

What are the rules? (cont)

- How do you markup tables that are used for layout?

You don’t, the rules only apply to data tables.

Simple Table (cont)



Simple Table (cont)

- Code

Cups of coffee consumed by each senator

```
<TABLE border="1">
  <TR><TD>Name</TD><TD>Cups</TD><TD>Type of Coffee</TD><TD>Sugar?</TD></TR>
  <TR><TD>T. Sexton</TD><TD>10</TD>
  <TD>Espresso</TD><TD>No</TD></TR>
  <TR><TD>J. Dinnen</TD><TD>5</TD>
  <TD>Decaf</TD><TD>Yes</TD></TR>
  <TR><TD>A. Soria</TD><TD colspan="3"> Not available</TD></TR>
</TABLE>
```

Simple Table: How to Code

* What is the first thing that needs to be done?

Identify all table row and column headers (1194.22(g)

* How do you make a table header?

Use the <TH> tag or Scope attribute

Simple Table: How to Code (cont)

- Table Header

Cups of coffee consumed by each senator

```
<TABLE border="1">
    <TR><TH>Name</TH><TH>Cups</TH><TH>Type
        of Coffee</TH><TH>Sugar?</TH></TR>
    <TR><TH>T. Sexton</TH><TD>10</TD>
    <TD>Espresso</TD><TD>No</TD></TR>
    <TR><TH>J. Dinnen</TH><TD>5</TD>
    <TD>Decaf</TD><TD>Yes</TD></TR>
    <TR><TH>A. Soria</TH><TD colspan="3">
    Not available</TD></TR>
</TABLE>
```

Simple Table: How to code (cont)

* Are we Done?

No

* Is there more than one logical level in the table?

* Yes, there are column headers and the first data cell of the row is actually a row header.

Simple Table: How to Code (cont)

- Explanation:
  - A column header defines information below it. The first data cell in the row is the name of an individual. The information on that row defines the information for the individual. This in essence makes it a Header for the row.
  - This definition can apply to parts numbers, job openings, etc.

Simple Table: How to Code (cont)

- Should I use Headers and ID for simple tables as specified by the W3C?

ID=COL1	ID=COL2	ID=COL3	ID=COL4
Headers= COL1	Headers= COL2	Headers= COL3	Headers= COL4
Headers= COL1	Headers= COL2	Headers= COL3	Headers= COL4
Headers= COL1	Headers= COL2	Headers= COL3	Headers= COL4

Simple Table: How to Code (cont)

- Do not use the previous method!
- Why
  - Because there isn't any association to the row headers.
- How should I code for the table?
  - You can use the Scope attribute or the id and headers attribute.

Simple Table: How to Code (cont)

- Headers and ID

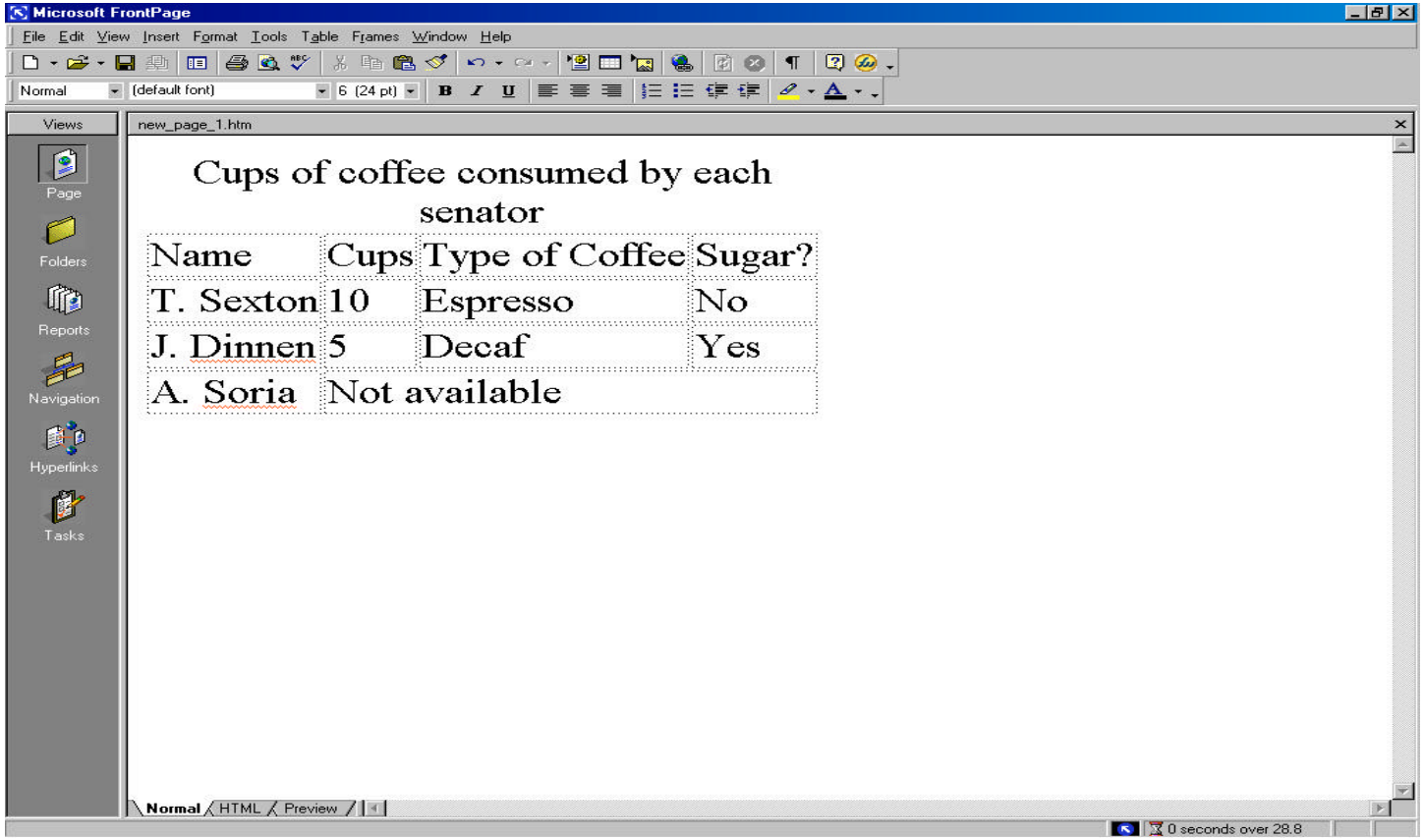
ID =COL1	ID =COL2	ID =COL3	ID=COL4
ID = Row1	Headers= Row1 COL2	Headers= Row1 COL3	Headers= Row1 COL4
ID = Row2	Headers= Row2 COL2	Headers= Row2 COL3	Headers= Row2 COL4
ID = Row3	Headers= Row3 COL2	Headers= Row3 COL3	Headers= Row3 COL4

Simple Table: How to Code (cont)

- Problems with Headers and ID
  - Every table header cell must have an ID
  - Every table data cell must have a “headers” attribute with the associated “ids”
  - Cumbersome to code for small simple tables or complicated for large simple tables.
- Is there another solution?

Simple Table: How to Code (cont)

- Review original table



Simple Table: How to Code (cont)

- Scope Attribute

Scope=COL	Scope=COL	Scope=COL	Scope=COL
Scope=Row			
Scope=Row			
Scope=Row			

Simple Table: How to Code (cont)

- Benefits:
  - Only the table headers require additional coding. Table data cells do not.
  - Table data cells are associated to the headers by the scope attributes (row and col) which define the entire column and row.
  - Easy to code
    - Cut and Paste
    - Easy to create dynamically generated table

Simple Table: How to Code (cont)

- Dynamically generated table (Generic approach)

```
<table border="0">
   <tr>
      <th scope="col">Column Name</th>
      <th scope="col"> Column Name </th>
      <th scope="col"> Column Name </th>
   </tr>
<Loop Query=“Query Name">
   <tr>
      <td scope="row">Field value</td>
      <td>Field value</td>
      <td>Field value</td>
   </tr>
</loop>
</table>
```

Simple Table: Summary

- Which is which

Table

Table

Table

Table

Which one is the data table?

Simple Table: Summary (cont)

- You don’t know the type of table if you are using a screen/Braille reader
- Web developers rarely code layout tables in the correct nested order
- What is the option?

Summary Attribute

Simple Table: Summary (cont)

- Summary Attribute
  - Place inside the <table> tag
  - Layout: state that the table is for layout
  - Data: brief description of what the table is about

Simple Table: Caption

- How about the table title?
  - Usually outside of the table
  - May have other information around the title
  - Could be confusing to the screen/Braille reader
- What can you do?

CAPTION tag

Simple Table: Caption (cont)

- Caption tag is an element of a table
  - Place after the <Table> tag and before the first <TR>
  - Can format in standard ways
- Why should I care?
  - You now have a complete table component

Simple Table: Complete

```
<table summary=“”>
   <caption> </caption>
  <tr>
     <th scope=“col”> </th>
     <th scope=“col”> </th>
   </tr>
    <tr>
     <td scope=“col”> </td>
     <td> </td>
   </tr>
</table>
```

Simple Table: How It Reads

- The screen/Braille reader will read as follows:
  - Table has ‘x’ amount of rows by ‘y’ amount of columns
  - It will then read the summary
  - It will then read the Caption (table title)
  - User now has the choice to jump to the next table, not wasting their time trying to figure out the table

Simple Table: Review

* Layout tables are required to have what type of markup?

Nothing, but should use a Summary attribute if the layout tables are not properly nested to distinguish layout and data tables.

Simple Table: Review (cont)

- * Simple data tables are required to have what type of markup?

Row and column headers, data cell association to headers

Simple Table: Review (cont)

- Why do I want to use Summary and Caption?

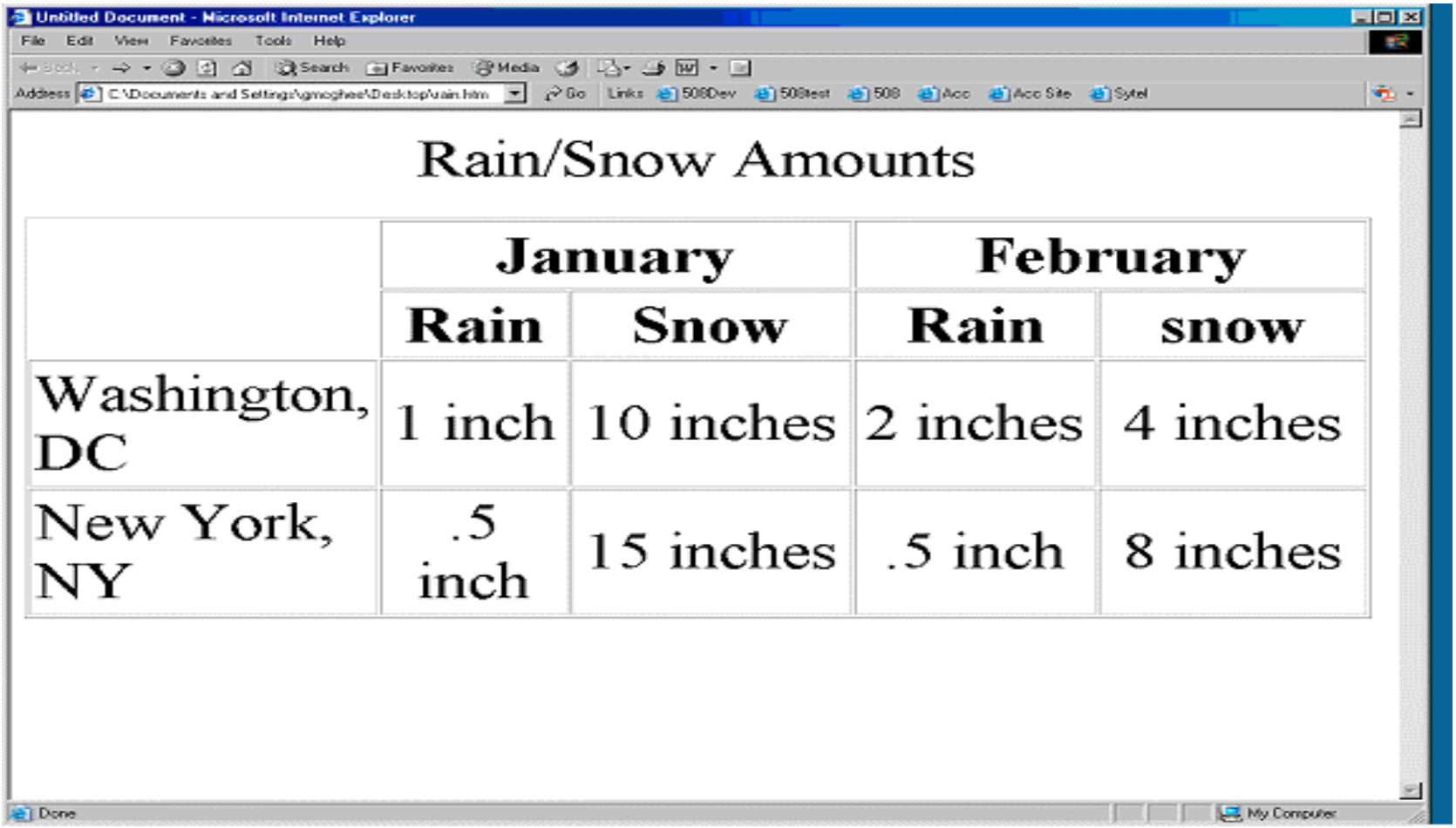
  Easier navigation for people using screen/Braille readers

  Good Customer Service

Complex Table

- Definition:
  - Complex table: A data table that has two or more column headers and/or row headers
  - Id: identifies the header cell for column. From the W3C “Each cell in the same column refers to the same header cell (via the ‘id’ attribute)”
  - Headers: specifies the list of header cells that provide header information for the current data cell

Complex Table (cont)



Rain/Snow Amounts

	January		February	
	Rain	**Snow**	**Rain**	**snow**
Washington, DC	1 inch	10 inches	2 inches	4 inches
New York, NY	.5 inch	15 inches	.5 inch	8 inches

Complex Table (cont)

- Can you use scope?
  - No, scope is for single columns. You may see examples of Scope in a column or row and on top of that column or beside that row another scope. That is incorrect coding.
- Can I use Scope="RowGroup" or "ColGroup"?
  - No, at this time it is not supported by the assistive technology.

Complex Table (cont)

- What do I use?
  - Id and Headers
  - The “id” attribute goes into the row and column headers.
    - The “id” must be unique in that table structure
  - The “headers” attribute goes into the all data cells in the table structure

Complex Table (cont)

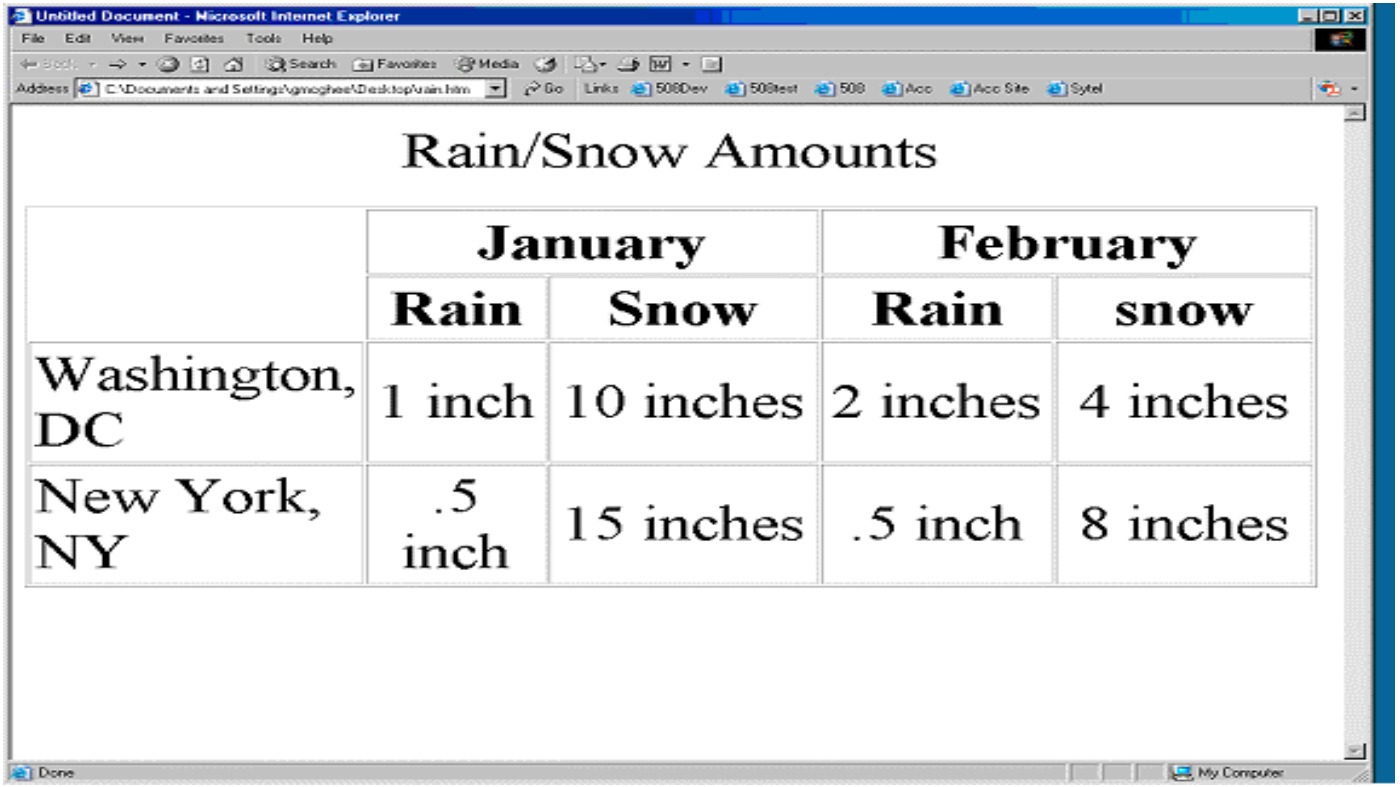
- How does it work?
  - The “id” attribute identifies the data cell.
  - The “headers” attribute identifies all the headers for that particular data cell.
  - The screenreader goes to a data cell and reads the “headers” attribute. Once it has determined the “id” of the headers, it then says the header information for the data cell.

Complex Table (cont)

- Things to be aware:
  - 1. The screenreader normally reads new header information when you change focus to a different row or column
  - 2. If a user gets lost in the table, they can use a key combination that gets ALL the header information for that data cell. That is why it is important that data tables are coded correctly.

Complex Table (cont)

- Review the table:



Complex Table (cont)

- Overall Code View (table below is represented by text code in next 2 slides)

	Id="month1"		Id="month2"	
	Id="rain1"	Id="snow1"	Id="rain2"	Id="snow2"
Id="city1"	Headers="city1 rain1 month1"	Headers="city1 snow1 month1"	Headers="city1 rain2 month2"	Headers="city1 snow2 month2"
Id="city2"	Headers="city2 rain1 month1"	Headers="city2 snow1 month1"	Headers="city2 rain2 month2"	Headers="city2 snow2 month2"

Complex Table (cont)

- Code Example

```
<table width="99%"  border="1" cellspacing="2" cellpadding="3" summary="Rain and snow amounts for Washington DC and New York City">
  <caption>
  <h3>Rain/Snow Amounts</h3>
        </caption>
  <tr>
    <th rowspan="2" width="19%"></th>
    <th colspan="2" id="month1">January</th>
    <th colspan="2" id="month2">February</th>
  </tr>
  <tr>
    <th width="16%" id="rain1"><div align="center">Rain</div></th>
    <th width="23%" id="snow1"><div align="center">Snow</div></th>
    <th width="20%" id="rain2"><div align="center">Rain</div></th>
    <th width="22%" id="snow2"><div align="center">snow</div></th>
  </tr>
```

Complex Table (cont)

- Code Example (cont)

```
<tr>
  <td id="city1">Washington, DC</td>
  <td headers="city1 rain1 month1"><div align="center">1 inch</div></td>
  <td headers="city1 snow1 month1"><div align="center">10 inches</div></td>
  <td headers="city1 rain2 month2"><div align="center">2 inches</div></td>
  <td headers="city1 snow2 month2"><div align="center">4 inches</div></td>
 </tr>
 <tr>
  <td id="city2">New York, NY</td>
  <td headers="city2 rain1 month1"><div align="center">.5 inch</div></td>
  <td headers="city2 snow1 month1"><div align="center">15 inches</div></td>
  <td headers="city2 rain2 month2"><div align="center">.5 inch</div></td>
  <td headers="city2 snow2 month2"><div align="center">8 inches</div></td>
 </tr>
</table>
```

Complex Table (cont)

- General Question:
  - 1194.22(g) says to identify row and column headers. The Access Board says to do this with the <TH> element. Why don't you use <TH> for the row headers?
- Answer:
  - If you review the definitions, which are taken from the W3C, using the "SCOPE" attribute along with "ROW" or "COL" identifies that data cell as a header cell.

Complex Table (cont)

- Common Errors:
  - Leaving out “id” attributes in the header cells
  - Leaving out the “id” names in the “headers” attribute
  - Duplicate “id” names in the header cells
  - “Headers” attributes with wrong “id” names
  - Using the “Scope” attribute

1194.22(I): Frames

Frames

- Definition
  - Frames shall be titled with text that facilitates frame identification and navigation

Frames

- Issue
  - Frames present difficulties for users with disabilities when those frames are not easily identifiable to assistive technology

Frames

- Solution
  - Use the “TITLE" attribute.
- Why
  - When frames are used in a web page, the first page that is loaded must include a <frameset> tag that encloses the basic layout of the frames on the page. Within the <frameset> tag, <frame> tags specify the name, initial contents, and appearance of each separate frame including a description of the <frame> using the “TITLE” attribute.

Frames

- Code Example:

```
<FRAMESET border=0 frameSpacing=0 frameBorder=0 cols=145,*>
    <FRAME title="Side Navigation Menu" name=left
  src="AHR_files/left_side.htm">
    <FRAMESET border=0 frame Spacing=0 rows=140, * frameBorder=0>
      <FRAME title="Top Navigation Menu" name=welcome
  src="AHR_files/welcome.htm" scrolling=no>
      <FRAME title="Main Content Area" name=right
  src="AHR_files/right_side.htm">
    </FRAMESET>
</FRAMESET>
```

Frames

- Common Errors
  - Leaving out the TITLE attribute
  - TITLE text is too vague or not descriptive
    - i.e. For left navigation bar saying “left side” instead of “left side menu navigation bar”

1194.22(j): Flicker Rate

Definition

- Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.

Flicker Rate

- Some individuals with photosensitive epilepsy can have a seizure triggered by displays that flicker, flash, or blink, particularly if the flash has a high intensity and is within certain frequency ranges

Flicker Rate (cont)

- Anyone can be subject to a photo-induced seizure.
- Stress, fatigue, or depression are some factors that can make someone photo-sensitive.

Flicker Rate (cont)

- Example of reaction to flicker
  - The old green screen monitors with the slow refresh rate caused the screen to flicker. This caused some people to have severe headaches and migraines.

Flicker Rate (cont)

- What are the elements that cause this?
  - Animated gifs
  - Applets
  - Objects
  - Marquee
  - Blink
  - Third party plug-ins
  - Applications

Flicker Rate (cont)

- Solution:
  - Avoid elements that cause flashing or flickering that are greater than 2 Hz or less than 55 Hz

1194.22(k): Text-only page

Definition

- A text-only page, with equivalent information or functionality, shall be provided to make a web site comply with the provisions of these standards, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.

Text-only Page

- Consider using a Text-only Page if:
  - An application may generate a web page that cannot be made Section 508 compliant.
  - Some elements on the web page cannot be made Section 508 compliant and require a text-only page (i.e. a JavaScript menu, scrolling news applet, etc)

Text-only Page (cont)

- Text-only page must:
  - contain equivalent information or functionality as the primary page
  - be updated at the same time whenever the primary page changes.
  - Only be used when a page element cannot be made compliant.
  - All other elements must comply

Text-only Page (cont)

- Issues
  - Maintaining equivalent information or functionality as the primary page
  - Assuring that the text-only page are updated at the same time as the primary page
  - A text-only web site is not an alternative method to comply with Section 508

1194.22(l): Scripts

Scripts (cont)

- Definition
  - When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology

Scripts (cont)

- Issues
  - A screen reader will often read the content of the script itself in a meaningless jumble of numbers and letters. Although this jumble is text, it cannot be interpreted or used.

Scripts (cont)

- Example 1: Links
  - Text link
    - the following link invokes a JavaScript function called myFunction:

    Start myFunction

    - This technique does not cause accessibility problems for assistive technology because the link is text

Scripts (cont)

- Example 1: Links (cont)
  - Using Images
    - <img src="myFunction.gif">
    - This coding doesn't allow the assistive technology user to understand what the link is about. The screen reader will say "Link graphic"

Scripts (cont)

- Example 1: Links (cont)
  - Using Images (cont)
    - Coding Option 1: Use the “TITLE” attribute:

      <img src="myFunction.gif">

      This is not fully supported by assisted technology and not recommended. There is a violation of 1194.22(a). The image needs an ALT attribute.

Scripts (cont)

- Example 1: Links (cont)
  - Using Images (cont)
    - Option 2 (Better): Use the “ALT” attribute:

    <img src="myFunction.gif" alt="picture link for starting myFunction">

    Recommended because assistive technology can read the “ALT” attribute and it satisfies 1194.22(a)

Scripts (cont)

- Example 2: Events
  - onMouseOver & onMouseOut
    - Issue: These event handlers can't be accessed by the mouse or keyboard. A screen reader simply bypasses them entirely.
    - Solution: Provide an alternative method of access

Scripts (cont)

- Example 2: Events (cont)
  - onMouseOver & onMouseOut (cont)
    - Example: Displaying a pop-up definition

    Incorrect:

    Definition

    Correct:

    <a href="definition1.htm"
    onMouseOver="show('definition1')">
    Definition

Scripts (cont)

- Example 2: Events (cont)
  - onMouseOver & onMouseOut (cont)
    - The user can now use the mouse, keyboard, and the screen reader will read the link
  - onChange
    - Issue: used for triggering JavaScript functions based on a selection from within a <select> tag
    - Avoid using this event and use the onClick event handler associated with a link or button that is adjacent to a <select> tag

Scripts (cont)

- Example 2: Events (cont)
  - onChange (cont)
    - Reason: An onChange event occurs whenever the object changes. The screenreader and keyboard user comes to the form control and uses the Up and Down Arrow to look through the selections. When the selection changes from the first object to the second object, an onChange event occurs. The user is never able to get pass the first option.

Scripts (cont)

- Example 3: Menus (cont)
  - JavaScript menus are designed so that with one click, the user will be able to get the information they are searching for on the web site.
  - JavaScript menus use multiple windows that open up on the screen for navigation or multiple drop down selections.

Scripts (cont)

- Example 3: Menus (cont)
  - JavaScript menus are primarily a mouse operation using an onMouseOver event. A user using a keyboard or screen reader will not be able to access the menu.
  - Solution:
    - On the first onMouseOver event, for each navigation area, create a hyperlink. This hyperlink will go to an alternative page with hyperlinks to the navigational areas in that menu structure.

Scripts (cont)

- Example 3: Menus
  - Solution (cont)
    - Do not create a link to the site map. Create individual pages with links for each main navigational structure.
    - This will allow the user to use the keyboard or assistive technology to navigate the menu.

Scripts (cont)

- Example 4: Pop-up Windows
  - Do not invoke a window using the JavaScript window function. Use the “window.open” function that calls a browser window.
  - Screen reader and keyboard users cannot access a non-Windows event handler because focus hasn’t been set through the Windows Application Protocol Interface (API).
  - Ensure that there is a method to close the window without using ALT-F4. Depending on the window, use a “Close button” or Windows “close” or “confirmation” buttons.

Scripts (cont)

- Common Errors
  - Using onChange instead of onClick
  - Using onClick without a submit button or image
  - Creating JavaScript menus without alternative navigation
  - Calling window or dialog box without a method to close it.
  - Calling a JavaScript window that does not set focus through the Windows API.

1194.22(m): Applets and Plug-ins

Applets and Plug-ins (cont)

- Definition
  - When a web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with §1194.21(a) through (l)

Applets and Plug-ins (cont)

- Issue:
  - Companies have developed proprietary file formats for transmitting and displaying special content
  - Web browsers can read HTML and display it to the user but cannot display proprietary file formats without the associated plug-in or reader

Applets and Plug-ins (cont)

- Types of Proprietary formats
  - Adobe Acrobat: PDF
  - MS-Word: DOC
  - Excel: XLS
  - PowerPoint: PPT
  - Real Audio: MP3
  - Flash: SWF
  - Etc.

Applets and Plug-ins (cont)

- What to look for?
  - File formats other TXT, RTF, and HTML
  - HTML Tags
    - <OBJECT>
    - <EMBEDDED>
    - <APPLET>
- Solution:
  - On every page where there is a proprietary format, provide a link to the plug-in or reader. You cannot put them in one central location and link to that page.

1194.22(n): Electronic Forms

Electronic Forms (cont)

- Definition
  - When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues

Electronic Forms (cont)

- Issue
  - The interaction between form controls and screen readers can be unpredictable, depending upon the design of the page containing these controls. Accessibility problems occur when web developers separate a form element from its associated label or title.

Electronic Forms (cont)

- Example 1
  - <FORM>
    <TABLE>
    <TR>
    <TD><B>FIRST NAME: </B></TD>
    <TD><INPUT TYPE="TEXT"
    NAME="FIRSTNAME"> </TD>
    </TR>
    </TABLE>
    <INPUT TYPE="SUBMIT" VALUE="SUBMIT">
    </FORM>

Electronic Forms (cont)

- Example 1 (cont)

First Name: 

Visually this looks correct. Reviewing the code you will notice that “First Name” and the textbox are in two separate data cells. An assistive technology device may or may not associate the “First Name” to the textbox.

Electronic Forms (cont)

- Example 2
  - <FORM>
    <TABLE>
    <TR>
    <TD><B>FIRST NAME: </B></TD>
    </TR>
    <TR>
    <TD><INPUT TYPE="TEXT"
    NAME="FIRSTNAME"> </TD>
    </TR>
    </TABLE>
    <INPUT TYPE="SUBMIT" VALUE="SUBMIT">
    </FORM>

Electronic Forms 2 (cont)

- Example (cont)

First Name

This example shows a common way of associating a title with a form field. Visually it looks good but the “First Name” is in a different cell and row.

Electronic Forms (cont)

- Solution
  - <LABEL> (element)
    - Definition: used to specify labels for controls
  - For (attribute)
    - Definition: explicitly associates the label being defined with another control. When present, the value of this attribute must be the same as the value of the “id” attribute of some other control in the same document. When absent, the label being defined is associated with the element's contents.

Electronic Forms (cont)

- Solution (cont)
  - Id (attribute)
    - Definition: This attribute assigns a name to an element. This name must be unique in a document.
  - How it works
    - The “id” gives the form control (input, select, textarea) a name
    - The “for” associates the LABEL to the form control
    - The LABEL specifies a title/label for the form control

Electronic Forms (cont)

- Solution (cont)
  - Let us put it together
    - <label for="fname_txt">First Name<</label>
      <input type="text" name="fname" id="fname-txt">
  - How does it work?
    - The screen/Braille reader gets focus on the textbox
    - Reads the "id" attribute in the textbox and locates the "for' attribute in the <LABEL>
    - Reads the text in the <LABEL></LABEL> element
    - Then reads the type of form control: "First Name Edit"

Electronic Forms (cont)

- Code Example:
  - <form>
    <table>
    <tr>
    <td><label for="fname_txt">First Name:
    </label> </td>
    </tr>
    <tr>
    <td><input type="text" name="fname"
    id="fname=txt"> </td>
    </tr>
    </table>
    <input type="submit" value="submit">
    </form>

Electronic Forms (cont)

- Code Example (cont):
  - How does it look?

First Name: 

  - As you may notice, it looks exactly the same as Example 1. The difference now is the screen/Braille reader can accurately read the associated label to the form control.

Electronic Forms (cont)

- Common Errors
  - Putting a space between words for the “id” and “for” attributes
    - id=“fname txt” for=“fname txt”
    - Spaces are not allowed, use the underscore character
  - “id” and “for” values do not match
    - id=“fname_txt” for=“fnam_txt”

Electronic Forms (cont)

- Common Errors (cont)
  - Missing “id” in form element
  - Missing “for” in <label> element
    - When absent, the label being defined is associated with the element's contents
  - Associating a <label> element with one “for” statement to multiple form controls
  - Missing <label> element

Electronic Forms (cont)

- Common Errors (cont)
  - Coding Errors
    - Example 1

      <label for="label_for_mw2"> </label>

      <input type="text" id="label_for_mw2" name="mw2">
      - Textbox has a label of space. Screen\Braille reader will say "Space Edit"

Electronic Forms (cont)

- Common Errors (cont)
  - Coding Errors (cont)
    - Example 2

      <label >First Name</label>

      <input type="text" name="mw2">
    - The <label> element is only associated to its element content, “First Name”. There is no association to the form control.

Electronic Forms (cont)

- Tip
  - You have a form that looks like this

    Telephone Number: 
  - How do I place <label> elements?
    - You could put them somewhere on the page and make the text the same as the background and very small font size (**Not Recommended**)
    - Or, you could use the TITLE attribute

Electronic Forms (cont)

- Tip (cont)
  - TITLE attribute
    - Offers advisory information about the element for which it is set.
    - Audio user agents may speak the title information in a similar context.
    - At this time, for use only with <input> type elements (text, checkbox, radio)

Electronic Forms (cont)

- Tabindex
  - Definition
    - Specifies the position of the current element in the tabbing order for the current document
  - Use
    - Provide users with mobility issues a way to access form elements without navigating hyperlinks
  - Code:
    - <input type="text' name="first" id="first_txt" tabindex="1">

Electronic Forms (cont)

- Completed Code
  - <form>
    <table>
    <tr>
    <td><label for=“fname_txt”>First Name:
    </label> </td>
    </tr>
    <tr>
    <td><input type=“text" name=“fname“
    id=“fname_txt” tabindex=“1”> </td>
    </tr>
    </table>
    <input type=“submit" value=“submit">
    </form>

1194.22(o): Skip Link

Definition

- A method shall be provided that permits users to skip repetitive navigation links.

Background

- The purpose of the skip link is to allow the user to by-pass repetitive navigational links to the main content of the page.
- For those who use screen readers or other types of assistive technologies, it can be a tedious and time-consuming chore to wait for the assistive technology to work through and announce each of the standard navigational links before getting to the intended location.

Technique 1: Text

- Should be the first link on the page
  - Code:
  - Skip to Main Content
- Main Content Area
  - Code:
  -

Technique 1 (cont)

- Why have it visible?
  - Available to all users including all types of assistive technology pointing devices and users who only use the keyboard.
  - Design consideration on where to place the Skip Link text
  - Text visible on page(s)

Technique 2: Image

- Should be first link on page
  - Code: 1 pixel transparent gif
  - <img src="1pixel.gif" border="0" alt="skip to main content">
- Main content area
  - Code
  -

Technique 2 (cont)

- Why have it invisible?
  - Not visible on web page(s)
  - Doesn't affect visual design of pages
  - Not visual to users with assistive technology pointing devices and users who only use the keyboard.
  - Can only be viewed with graphics turned off

Common Errors

- Error 1: Missing Anchor
  - You have the Bookmark:
    - <img src="1pixel.gif" border="0" alt="skip to main content">
  - Missing the anchor:
    -

Common Errors (cont)

- Error 2: Bookmark
  - Missing Bookmark:
    - <img src="1pixel.gif" border="0" alt="skip to main content">
  - Have the anchor:
    -

Common Errors (cont)

- Error 3: Bookmark
  - Bookmark is not assigned to a value
    -
  - Anchor
    - <a name="content"><a>

Common Errors (cont)

- Error 4: HTML coding error
  - Bookmark:
    -
  - Anchor:
    -
  - Issue:
    - Alt is not a valid HTML attribute for <a href=>

Bad Design Coding

- Error 5: Bad design
  - Bookmark:
    -
    - Text same color as background
  - Anchor:
    -
  - Issue:
    - Screen reader and Braille reader say " this page link space"
    - Not visible to anyone

Bad Design Coding (cont)

- Error 6: Bad design
  - Bookmark:
    - A
    - Text same color as background
  - Anchor:
    -
  - Issue:
    - Not visible unless color turned off
    - Tabbing to link doesn't show TITLE attribute because tooltips are a mouse function

1194.22(o): Timed Response

Timed Response (cont)

- Definition
  - When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required

Timed Response (cont)

- Issues
  - Someone with extremely low vision may be a slower-than-average reader
  - Someone using assistive technology may not be able respond to all questions within the allotted time
  - Many forms, when they "time out" automatically, also delete data that has been entered. The result is that someone with a disability who is slow to enter data cannot complete the form

Timed Response (cont)

- Solution
  - The user shall be alerted via a prompt and given sufficient time to indicate whether additional time is needed
  - How much time?
    - That would based on a discussion about security requirements
    - Timed response tests may require a separate test

General Usability Issues

- Avoid using hyperlinks that say “more”, “click here”, “show more”, etc
  - Reason: “more”, “more”, “more”, “more”, which “more” is the link to more about FAA?
    - Screenreader users can create a link list of all the links on a web page. If there are multiple links with the same name but going to different content, then this becomes very confusing.

General Usability Issues (cont)

- Solution:
  - 1. Use descriptive text, (i.e. “more FAA” instead of “more”)
  - 2. If you really need to use repetitive names then use the “TITLE” attribute in the link.

more

Not all assistive technology supports this but if you can’t do #1 above then this is a better alternative.

General Usability Issues (cont)

- Avoid using “mailto” links
  - Reason
    - Mailto links, e.g., Jsimon@xyz.gov, can be confusing in the way a screenreader speaks (i.e. FAA.gov doesn’t sound like “F A A dot gov”; it sounds like “fah dot gov”)
  - Solution
    - Use the name of the person or entity

      Jay Simon

      The screenreader says “mailto Jay Simon”.

Resource Guide Website List

- FAA
  - Section 508 web site

    http://intranet.faa.gov/aio/508
- Federal Government:
  - Access Board:
    http://www.access-board.gov/508.htm
  - Section 508.gov:
    http://www.section508.gov

Resource Guide Website List

- Non-Government sites:
  - Trace Center: http://trace.wisc.edu/world/web
  - Web AIM Resources: http://www.webaim.org
    - Web AIM Tutorials: http://www.webaim.org/tutorials
    - Web Aim HowTo: http://www.webaim.org/howto