



Information and Communication Technology (ICT) Standards and Guidelines

Notice of Proposed Rulemaking
February 2015

36 CFR Parts 1193 and 1194
RIN 3014-AA37

U.S. Access Board

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PREAMBLE

SUMMARY: The Architectural and Transportation Barriers Compliance Board (Access Board or Board), is proposing to revise and update, in a single document, both its standards for electronic and information technology developed, procured, maintained, or used by federal agencies covered by section 508 of the Rehabilitation Act of 1973, and its guidelines for telecommunications equipment and customer premises equipment covered by Section 255 of the Communications Act of 1934. The proposed revisions and updates to the section 508-based standards and section 255-based guidelines are intended to ensure that information and communication technology covered by the respective statutes is accessible to and usable by individuals with disabilities.

DATES: Submit comments by May 28, 2015. **Two hearings will be held on the proposed rule on:**

1. **March 5, 2015, 9:30 to 11:30 a.m., San Diego, CA and**
2. **March 11, 2015, 9:30 to 11:30 a.m., Washington, DC.**

To preregister to testify at either of the hearings, contact Kathy Johnson at (202) 272-0041 (voice), (202) 272-0082 (TTY), or johnson@access-board.gov.

ADDRESSES: Submit comments by any one of the following methods:

- Federal eRulemaking Portal: <http://www.regulations.gov>. Follow the instructions for submitting comments. The Regulations.gov ID for this docket is ATBCB-2015-0002.
- E-mail: docket@access-board.gov. Include docket number ATBCB-2015-0002 in the subject line of the message.
- Fax: 202-272-0081.
- Mail or Hand Delivery/Courier: Office of Technical and Information Services, Access Board, 1331 F Street, NW, Suite 1000, Washington, DC 20004-1111.

All comments, including any personal information provided, will be posted without change to <http://www.regulations.gov> and be available for public viewing.

The hearing locations are:

1. San Diego, CA: Manchester Grand Hyatt Hotel (Mission Beach A & B, 3rd floor), One Market Place, San Diego, CA 92101.
2. Washington, DC: Access Board conference room, 1331 F Street NW., suite 800, Washington, DC 20004.

Witnesses can testify in person at the hearing in San Diego. Witnesses can testify in person or by telephone at the hearing in Washington, DC. Copies of the rule will not be available at the hearings. Call-in information and a communication access real-time translation (CART) web streaming link for the Washington, DC hearing will be posted on the Access Board's website at <http://www.access-board.gov/ictrefresh>. The hearings will be accessible to persons with disabilities. An assistive listening system, communication access real-time

translation, and sign language interpreters will be provided. Persons attending the meetings are requested to refrain from using perfume, cologne, and other fragrances for the comfort of other participants (see <http://www.access-board.gov/the-board/policies/fragrance-free-environment> for more information).

FOR FURTHER INFORMATION CONTACT: Timothy Creagan, Access Board, 1331 F Street, NW, Suite 1000, Washington, DC 20004-1111. Telephone: (202) 272-0016 (voice) or (202) 272-0074 (TTY). E-mail address: 508@access-board.gov.

SUPPLEMENTARY INFORMATION:

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- I. Public Participation and Request for Comments
- II. Executive Summary
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In this preamble, the Architectural and Transportation Barriers Compliance Board is referred to as “Access Board,” “Board,” “we,” or “our.”

I. Public Participation and Request for Comments

The Access Board encourages all persons interested in the rulemaking to submit comments on this proposed rule, as well as the preliminary assessment of its estimated benefits and costs. While the Board invites comment on any aspect of our proposed rule and regulatory assessment, we particularly seek information and data in response to the questions posed throughout this preamble. Instructions for submitting and viewing comments are provided under the “Addresses” heading above. The Board will consider all timely comments and may change the proposed rule based on such comments.

II. Executive Summary

Purpose and Legal Authority

We are proposing to update our existing Electronic and Information Technology Accessibility Standards under section 508 of the Rehabilitation Act of 1973, (“508 Standards”), as well as our Telecommunications Act Accessibility Guidelines under Section 255 of the Communications Act of 1934 (“255 Guidelines”). Since the guidelines and standards were issued in 2000 and 1998 respectively, there has been a technological revolution, accompanied by an ever-expanding use of technology and a proliferation of accessibility standards globally. Technological advances have resulted

in the widespread use of multifunction devices that call into question the ongoing utility of the product-by-product approach used in the Access Board's existing 508 Standards and 255 Guidelines. For example, since the existing 508 Standards were issued in 2000, mobile phones moved from devices with voice-only capability, to so-called "smartphones" offering voice, text, and video communications. Desktop computers are no longer the only information processing hardware: mobile devices and tablets, which have very different input and output characteristics, can typically process vast amounts of electronic information and function like desktop computers or telephones. In recognition of these converging technologies, one of the primary purposes of the proposed rule is to replace the current product-based approach with requirements based on functionality, and, thereby, ensure that accessibility for people with disabilities keeps pace with advances in electronic and information technology.

Additionally, a number of voluntary consensus standards have been developed by standards organizations worldwide over the past decade. Examples of these standards include: the Web Accessibility Initiative's Web Content Accessibility Guidelines (WCAG) 2.0, EN 301 549 V1.1.1 (2014-02), "Accessibility requirements for public procurement of ICT products and services in Europe," and the Human Factors Ergonomics Society's ANSI/HFES 200.2 (2008) ergonomics specifications for the design of accessible software. The harmonization with such international standards and guidelines creates a larger marketplace for accessibility solutions, thereby attracting more offerings and increasing the likelihood of commercial availability of accessible information and communication technology options.

These dramatic changes have led the Access Board to propose revisions to the existing 508 Standards and 255 Guidelines. We are proposing to update the two sets of regulatory provisions jointly to ensure consistency in accessibility across the spectrum of communication and electronic and information technologies and products. The proposed standards and guidelines would support the access needs of individuals with disabilities, while also taking into account the costs to federal agencies and manufacturers of telecommunications equipment of providing accessible electronic information and communication technology.

The term "information and communication technology" (ICT) is used widely throughout this preamble and the proposed rule. Unless otherwise noted, it is intended to broadly encompass electronic and information technology covered by Section 508, as well as telecommunications products, interconnected Voice over Internet Protocol (VoIP) products, and Customer Premises Equipment (CPE) covered by Section 255. Examples of ICT include computers, information kiosks and transaction machines, telecommunications equipment, multifunction office machines, software, websites, and electronic documents.

This proposed rule would eliminate 36 CFR Part 1193 in its entirety, revise 36 CFR 1194, and add three new appendices to Part 1194 containing the Application and Scoping Requirements for the 508 Standards (Appendix A), the Application and Scoping Requirements for the 255 Guidelines (Appendix B), and new Technical Requirements that apply to both Section 508-covered and Section 255-covered ICT. In

this preamble, the Board refers to specific provisions of the proposed new 508 Standards and 255 Guidelines by their proposed new section numbers: E101-103 (508 Chapter 1: Application and Administration); E201-208 (508 Chapter 2: Scoping Requirements); C101-103 (255 Chapter 1: Application and Administration); C201-206 (255 Chapter 2: Scoping Requirements); 301-302 (Chapter 3: Functional Performance Criteria); 401-413 (Chapter 4: Hardware); 501-504 (Chapter 5: Software); and 601-603 (Support Documentation and Services).

Legal Authority for 508 Standards: Section 508 of the Rehabilitation Act of 1973 (hereafter, “Section 508”), as amended, 29 U.S.C. 794d, mandates that federal agencies “develop, procure, maintain, or use” ICT in a manner that ensures federal employees with disabilities have comparable access to and use of such information and data relative to other federal employees, unless doing so would impose an undue burden. The Rehabilitation Act also requires federal agencies to ensure that members of the public with disabilities have comparable access to publicly-available information and services unless doing so would impose an undue burden on the agency. In accordance with section 508(a)(2)(A), the Access Board must publish standards that define electronic and information technology along with the technical and functional performance criteria necessary for accessibility, and periodically review and amend the standards as appropriate. When the Access Board revises its existing 508 Standards (whether to keep up with technological changes or otherwise), the Rehabilitation Act mandates that, within six months, both the Federal Acquisition Regulatory Council (FAR Council) and federal agencies incorporate these revised standards into their respective acquisition regulations and procurement policies and directives. Thus, with respect to procurement-related matters, the Access Board’s 508 Standards are not self-enforcing; rather, these standards become enforceable when adopted by the FAR Council and federal agencies.

Legal Authority for 255 Guidelines: Section 255 of the Communications Act, 47 U.S.C. 255 (hereafter, “Section 255”), requires telecommunications equipment and services to be accessible to and usable by individuals with disabilities, where readily achievable. “Readily achievable” is defined in the statute as “easily accomplishable and able to be carried out without much difficulty or expense.” In determining whether an access feature is readily achievable, the Federal Communications Commission (FCC), which has exclusive authority over enforcement under Section 255, has directed telecommunications equipment manufacturers and service providers to weigh the nature and cost of that feature against the individual company’s overall financial resources, taking into account such factors as the type, size, and nature of its business operation. Under Section 255, the Access Board is required to develop guidelines for the accessibility of telecommunications equipment and customer premises equipment in conjunction with the FCC and to review and update the guidelines periodically. The FCC is responsible for enforcing Section 255 and issuing implementing regulations; it is not bound to adopt the Access Board’s guidelines as its own or to use them as minimum requirements.

Summary of Key Provisions

A. Proposed 508 Standards

The proposed standards replace the current product-based approach with a functionality-based approach. The proposed technical requirements, which are organized along the lines of ICT functionality, provide standards to ensure that covered hardware, software, electronic content, and support documentation and services are accessible to people with disabilities. In addition, the proposed standards include functional performance criteria, which are outcome-based provisions for cases in which the proposed technical requirements do not address one or more features of ICT.

The four major changes in the proposed 508 Standards are:

- Broad application of WCAG 2.0: The proposed rule would incorporate by reference the Web Content Accessibility Guidelines (WCAG) 2.0, a voluntary consensus standard developed by ICT industry representatives and other experts. It would also make WCAG 2.0 Success Criteria applicable not only to content on the “World Wide Web” (hereafter, Web), but also to non-Web electronic documents and software (e.g., word processing documents, portable document format files, and project management software). By applying a single set of requirements to websites, electronic documents, and software, this proposed provision would adapt the 508 Standards to reflect the newer multifunction technologies (e.g., smartphones that have telecommunications functions, video cameras, and computer-like data processing capabilities) and address the accessibility challenges that these technologies pose for individuals with disabilities.
- Delineation of covered electronic “content”: The proposed rule would also specify that all types of public facing content, as well as eight enumerated categories of non-public facing content that communicate agency official business, would have to be accessible, with “content” encompassing all forms of electronic information and data. The existing standards require federal agencies to make electronic information and data accessible, but do not delineate clearly the scope of covered information and data; as a result, document accessibility has been inconsistent across federal agencies. By focusing on public facing content and certain types of agency official communications that are not public facing, the proposed rule would bring needed clarity to the scope of electronic content covered by the 508 Standards and, thereby, help federal agencies make electronic content accessible more consistently.
- Expanded interoperability requirements: The existing standards require ICT to be compatible with assistive technology – that is, hardware or software that increases or maintains functional capabilities of individuals with disabilities (e.g., screen magnifiers or refreshable braille displays). But, because this requirement has given rise to ambiguity in application, the proposed rule would provide more specificity about how operating systems, software development toolkits, and

software applications should interact with assistive technology. These proposed requirements would allow assistive technology users to take full advantage of the functionalities that ICT products provide.

- Requirement for RTT functionality: The proposed standards would require real-time text (RTT) functionality wherever an ICT product provides real-time, two-way voice communication. RTT is defined in the proposed rule as text that is transmitted character by character as it is being typed. An RTT recipient can read a message while it is being written, without waiting for the message to be completed; this is different from other message technologies such as “short messaging service”, or SMS, which transmit the entire message only after typing is complete. This proposed requirement would have an impact on federal agencies as well as ICT providers, federal employees, and members of the public.

B. Proposed 255 Guidelines

Given the trend toward convergence of technologies and ICT networks, the Access Board is updating the 255 Guidelines at the same time that it is updating the 508 Standards. The existing guidelines include detailed requirements for the accessibility, usability, and compatibility of telecommunications equipment and customer premises equipment. For example, the guidelines require input, output, display, control, and mechanical functions to be accessible to individuals with disabilities. The compatibility requirements focus on the need for standard connectors, compatibility of controls with prosthetics, and TTY compatibility. The guidelines define “usable” as providing access to information about how to use a product, and direct that instructions, product information, documentation, and technical support for users with disabilities be functionally equivalent to that provided to individuals without disabilities. The proposed guidelines include many non-substantive revisions to the existing requirements for clarity along with a few important new provisions. Two notable proposed additions to the proposed 255 Guidelines are:

- Requirement for RTT functionality: Just as the proposed 508 Standards would require federal agencies to offer RTT functionality in certain ICT, the proposed 255 Guidelines would require the manufacturers of telecommunications equipment to provide RTT functionality wherever a telecommunications product provides real-time, two-way voice communication. This proposed requirement would allow people who are deaf or hard of hearing to have faster and more natural conversations than the current text-messaging functionality.
- Application of WCAG 2.0 to electronic documents: The proposed 255 Guidelines would preserve the current requirement that when a document is provided in a non-electronic format, alternate formats (such as large-print or braille) usable by individuals with vision impairments need to be provided. The proposed guidelines also would require documentation in electronic formats—including Web-based self-service support and electronic documents—to conform to all Level A and AA Success Criteria in WCAG 2.0 or ISO 14289-1 (PDF/UA-1). This

proposal for accessible electronic support documentation is derived from the existing guidelines, but would newly require compliance with WCAG 2.0 or PDF/UA-1. This proposal is intended to address the problem that many online product (or support) documents for telecommunications equipment are inaccessible to individuals with visual impairments.

Summary of Preliminary Regulatory Analysis

Consistent with the obligation that federal agencies under Executive Orders 12866 and 13563 propose and adopt regulations only upon a reasoned determination that benefits justify costs, the proposed rule has been evaluated from a benefit-cost perspective in a preliminary regulatory impact analysis (Preliminary RIA) prepared by the Board's consulting economic firm. The focus of the Preliminary RIA is to define and, where possible, quantify and monetize the potential economic benefits and costs of the proposed 508 Standards and 255 Guidelines. We summarize its methodology and results below; a complete copy of this regulatory assessment is available on the Access Board's website (www.access-board.gov), as well the federal government's online rulemaking portal (www.regulations.gov).

To estimate likely incremental compliance costs attributable to the proposed rule, the Preliminary RIA estimates, quantifies, and monetizes costs in the following broad areas: (1) costs to federal agencies and contractors related to policy development, employee training, development of accessible ICT, evaluation of ICT, and creation or remediation electronic documents; and (2) costs to manufacturers of telecommunications equipment and customer premises equipment of ensuring that their respective websites and electronic support documentation conform to accessibility standards, including WCAG 2.0.

On the benefits side, the Preliminary RIA estimates likely incremental benefits by monetizing the value of three categories of benefits expected to accrue from the proposed 508 Standards: (a) increased productivity of federal employees with certain disabilities who are expected to benefit from improved ICT accessibility; (b) time saved by members of the public with certain disabilities when using more accessible federal websites; and (c) reduced phone calls to federal agencies as members of the public with certain disabilities shift their inquiries and transactions online due to improved accessibility of federal websites. The Preliminary RIA, for analytical purposes, defines the beneficiary population as persons with vision, hearing, and speech disabilities, as well as those with manipulation, reach, or strength limitations. The Preliminary RIA does not formally quantify or monetize benefits accruing from the proposed 255 Guidelines due to insufficient data and methodological constraints.

Table 1 below summarizes the results from the Preliminary RIA with respect to the likely monetized benefits and costs, on an annualized basis, from the proposed 508 Standards and 255 Guidelines. All monetized benefits and costs are incremental to the applicable baseline, and were estimated for a 10-year time horizon using discount rates of 7 and 3 percent.

**Table 1 - Annualized Value of Monetized Benefits and Costs under the Proposed Rule, 2015-2024
(in 2015 dollars)**

	7% Discount Rate (in millions)	3% Discount Rate (in millions)
Monetized incremental benefits to federal agencies, members of the public with vision disabilities (under proposed 508 Standards)	\$69.1	\$67.5
Monetized incremental costs to federal agencies (under proposed 508 Standards)	\$155.0	\$146.8
Monetized incremental costs to telecommunications equipment manufacturers (under proposed 255 Guidelines)	\$10.6	\$9.8

While the Preliminary RIA monetizes likely incremental benefits and costs attributable to the proposed rule, this represents only part of the regulatory picture. Today, though ICT is now woven into the very fabric of everyday life, millions of Americans with disabilities often find themselves unable to use—or use effectively—computers, mobile devices, federal agency websites, or electronic content. The Board’s existing standards and guidelines are greatly in need of a “refresh” to keep up with technological changes over the past fifteen years. The Board expects this proposed rule to be a major step toward ensuring that ICT is accessible to and usable by individuals with disabilities—both in the federal workplace and society generally. Indeed, much—if not most—of the significant benefits expected to accrue from the proposed rule are difficult if not impossible to quantify, including: greater social equality, human dignity, and fairness. Each of these values is explicitly recognized by Executive Order 13563 as important qualitative considerations in regulatory analyses.

Moreover, American companies that manufacture telecommunications equipment and ICT-related products would likely derive significant benefits from the harmonized accessibility standards. Given the relative lack of existing national and globally-recognized standards for accessibility of mobile technologies, telecommunications equipment manufacturers would greatly benefit from harmonization of the 255 guidelines with consensus standards. Similar benefits would likely accrue more generally to all ICT-related products as a result of harmonization.

It is also equally important to note that some potentially substantial incremental costs arising from the proposed rule are not evaluated in the Preliminary RIA, either because such costs could not be quantified or monetized (due to lack of data or for other methodological reasons) or are inherently qualitative. The impact of the proposed 255 Guidelines on telecommunications equipment manufacturers is, as the Preliminary RIA notes, particularly difficult to quantify due to lack of cost data and a dynamic

telecommunications marketplace. As a consequence, for example, the Preliminary RIA thus neither quantifies nor monetizes potential compliance costs related to the proposed requirement that ICT providing real-time, two-way voice communication support RTT functionality.

The Access Board welcomes comments on all aspects of the Preliminary RIA to improve the assumptions, methodology, and estimates of the incremental benefits and costs of the proposed rule. The full Preliminary RIA posted on the Board's website poses numerous regulatory assessment-related questions or areas for public comment, and interested parties are encouraged to review that document and provide responsive data and other information. In addition, the Board sets forth below—in the section providing a more in-depth discussion of the Preliminary RIA—several additional questions on which it seeks input. See Section VIII.A.6 (Regulatory Process Matters – Preliminary Regulatory Impact Analysis – Conclusion).

III. Statutory Background

Section 508 of the Rehabilitation Act of 1973, as amended (hereafter, “Section 508”), calls for the Access Board to issue and publish standards setting forth the technical and functional performance criteria necessary to implement the Act's accessibility requirements for electronic and information technology. The statute also provides that the Board shall periodically review and, as appropriate, amend the standards to reflect technological advances or changes in electronic and information technology. This proposed rule uses the term “508 Standards” to refer to the standards called for by the Rehabilitation Act.

Section 255 of the Communications Act of 1934, as amended (hereafter, “Section 255”), tasks the Access Board with the development of guidelines for accessibility of telecommunications equipment and customer premises equipment, and provides that the Board shall review and update the guidelines periodically. Note that reference is made here to “Section 255 of the Communications Act”, rather than the commonly used reference to “Section 255 of the Telecommunications Act of 1996” because the Telecommunications Act does not itself contain a section 255. Instead, the Telecommunications Act amended the Communications Act by adding a new section 255 to it. Therefore, for the sake of simplicity and accuracy, this proposed rule uses the term “255 Guidelines” to refer to the guidelines called for by the amended Communications Act.

As noted in the Summary above, this proposed rule seeks to revise and update both the 508 Standards and 255 Guidelines in a single rulemaking. The Access Board is taking this approach because we feel that the two sets of requirements, by virtue of their subject matter, are inextricably linked from a regulatory and policy perspective.

IV. Rulemaking History

A. Existing 508 Standards and 255 Guidelines (1998-2000)

We issued the 255 Guidelines in 1998, 63 FR 5608 (Feb. 3, 1998), and these are available on our website at www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-telecommunications-act-guidelines/section-255-guidelines. The Board's 508 Standards, issued in 2000, 65 FR 80500 (Dec. 21, 2000), are available at www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards. They were codified in 36 CFR Part 1193 and 36 CFR Part 1194, respectively. In this preamble, all citations to 36 CFR Part 1193 refer to the existing 255 Guidelines in force since 1998, while all citations to 36 CFR Part 1194 refer to the existing 508 Standards in force since 2000.

The existing 508 Standards require federal agencies to ensure that persons with disabilities—namely, federal employees with disabilities and members of the public with disabilities—have comparable access to, and use of, electronic and information technology (regardless of the type of medium) absent a showing of undue burden. See 36 CFR Part 1194. Among other things, these standards: define key terms (such as “electronic and information technology” and “undue burden”); establish technical requirements and functional performance criteria for covered information and technologies; require agencies to document undue burden determinations when procuring covered products; and mandate accessibility of support documentation and services. Generally speaking, the existing 508 Standards take a product-based regulatory approach in that technical requirements for electronic and information technology are grouped by product type: software applications and operating systems; Web-based intranet and Internet information and applications; telecommunications products; self-contained, closed products; and desktop and portable computers.

The existing 255 Guidelines require manufacturers of telecommunications equipment and customer premises equipment to ensure that new and substantially upgraded existing equipment is accessible to, and usable by, individuals with disabilities when readily achievable. See 36 CFR Part 1193. The existing guidelines, as with the 508 Standards, define key terms (such as “telecommunications equipment” and “readily achievable”) and establish technical requirements for covered equipment, software, and support documentation. These guidelines also require manufacturers of covered equipment to consider inclusion of individuals with disabilities in their respective processes for product design, testing, trials, or market research.

B. Advisory Committee and Final Report (2006-2008)

In the years following our initial promulgation of the 508 Standards and 255 Guidelines, technology continued to evolve at a rapid pace. Pursuant to our statutory mandate, the Board deemed it necessary and appropriate to review and update the 508 Standards and 255 Guidelines in order to make them consistent with one another and reflective of

technological changes. The Board formed the Telecommunications and Electronic and Information Technology Advisory Committee (hereafter, “Advisory Committee”) in 2006 to review the existing 508 Standards and 255 Guidelines and recommend amendments. The Advisory Committee’s forty-one members comprised a broad cross-section of stakeholders representing industry, disability groups, and government agencies. The Advisory Committee also included representatives from the European Commission, Canada, Australia, and Japan. The Advisory Committee recognized the importance of standardization across markets worldwide and coordinated its work with standard-setting bodies in the U.S. and abroad, such as the World Wide Web Consortium (W3C®), and with the European Commission. The Advisory Committee addressed a range of issues, including new or convergent technologies, market forces, and international harmonization.

On April 3, 2008, the Advisory Committee presented us with its report (hereafter, “TEITAC Report”) recommending amendments to the 508 Standards and 255 Guidelines. The TEITAC Report is available at www.access-board.gov/teitac-report.

C. First Advance Notice of Proposed Rulemaking (2010)

1. General

Based on the TEITAC Report, the Board developed an Advance Notice of Proposed Rulemaking in 2010 (2010 ANPRM) to update the 508 Standards as well as the 255 Guidelines. On the recommendation of the Advisory Committee, the Board used the phrase “Information and Communication Technology” (ICT) to collectively refer to the products addressed by the rules. A complete discussion of this proposed change is found in Section VI.B (Section-by-Section Analysis – 508 Standards: Application and Scoping – E103), and Section VI.C (Section-by-Section Analysis – 255 Guidelines: Application and Scoping – C103). The 2010 ANPRM was published in the Federal Register, 75 FR 13457 (March 22, 2010), and is available at www.access-board.gov/ict2010anprm.

2. Structure

The 2010 ANPRM began with two separate introductory chapters. “508 Chapter 1: Application and Administration,” contained provisions preceded by the letter “E,” and included scoping, application, and definition provisions particular to the 508 Standards. “255 Chapter 1: Application and Administration,” contained provisions preceded by the letter “C,” and included similar provisions particular to the 255 Guidelines. The 2010 ANPRM also included, in Chapter 2, a common set of functional performance criteria for the 508 Standards and the 255 Guidelines that required ICT to provide access to all functionality in at least one of each of ten specified modes. Chapter 3 contained technical requirements applicable to features of ICT found across a variety of platforms, formats, and media.

Chapters 4, 5, and 6 all contained technical requirements that were closely adapted from the Web Content Accessibility Guidelines (WCAG) 2.0 Success Criteria but rephrased as mandatory requirements. Chapter 4 addressed platforms, applications, interactive content, and applications. Chapter 5 covered access to electronic documents and common interactive elements found in content, and Chapter 6 addressed access to audio and visual content, as well as players of such content.

Chapter 7 addressed hardware aspects of ICT, such as standard connections and reach ranges. Chapter 8 addressed ICT with audio output functionality when that output is necessary to inform, alert, or transmit information or data. Chapter 9 addressed ICT supporting real-time simultaneous conversation in audio, text, or video formats and Chapter 10 covered product support documentation and services.

3. Hearings and General Comments

The Access Board held two public hearings on the 2010 ANPRM—March 2010 (San Diego, CA) and July 2010 (Washington, DC). We also received 384 written comments during the comment period. Comments came from industry, federal and state governments, foreign and domestic companies specializing in information technology, disability advocacy groups, manufacturers of hardware and software, trade associations, institutions of higher education, research and trade organizations, accessibility consultants, assistive technology industry and related organizations, and individuals.

In general, commenters agreed with our approach to addressing the accessibility of ICT through functionality rather than discrete product types. Commenters also expressed strong support for our efforts to update the 508 Standards and 255 Guidelines, as well as our decision to follow the Advisory Committee's recommendation to require harmonization with WCAG 2.0. However, many commenters expressed concern that the 2010 ANPRM was not user-friendly, e.g., that it was too long (at close to 100 pages), organized in a confusing manner, and suffered from some internal inconsistencies. For example, commenters noted confusion by virtue of the fact that some chapters focused on functional features of accessibility while others addressed specific types of technology, or that the meaning of "ICT" seemed to vary depending on the context of the specific chapter.

D. Second Advance Notice of Proposed Rulemaking (2011 ANPRM)

1. General

Upon reviewing the extensive and detailed comments on the 2010 ANPRM, the Board realized the need to reorganize the structure of the proposed rule. More importantly, we needed to obtain further public comment on major issues and harmonize with the European Commission's ICT standardization efforts that were already underway at that time. Accordingly, the Board issued a second ANPRM (2011 ANPRM) that, as discussed in detail below, differed significantly from the 2010 ANPRM in terms of both

structure and content. The 2011 ANPRM was published in the Federal Register, 76 FR 76640 (Dec. 8, 2011), and is also available at [www.access-board.gov/ ict2011anprm](http://www.access-board.gov/ict2011anprm).

2. Structure

In response to public comments on the 2010 ANPRM that the length and organization of the document made it unwieldy, the Board consolidated and streamlined provisions into six chapters (from ten), consolidated advisories, and reduced the page count from close to 100 to less than 50. The Board also removed scoping and application language from the chapters containing technical provisions and relocated them to new chapters applicable to Section 508 (508 Chapters 1 and 2) and Section 255 (255 Chapters 1 and 2) respectively. We revised the overall structure of the functional performance criteria so that the provisions had parallel structure, and grouped technical requirements for similar functions together in the same chapter. To address inconsistencies in the 2010 ANPRM, where some chapters focused on features of products and others addressed specific types of products, the Board standardized its approach by removing references to types of products while focusing instead on specific features of products. We also removed specific proposed requirements relating to Web and non-Web content, documents and user applications, and referenced WCAG 2.0 instead.

3. Hearings and General Comments

Hearings were held in January 2012 in Washington, DC and in March 2012 in San Diego, CA. Additionally, ninety-one written comments were received in response to the 2011 ANPRM. Comments came from industry, federal and state governments, foreign and domestic companies specializing in information technology, disability advocacy groups, manufacturers of hardware and software, trade associations and trade organizations, institutions of higher education and research, accessibility consultants, assistive technology industry and related organizations, and individual stakeholders who did not identify with any of these groups.

In general, commenters continued to agree with our approach to address ICT accessibility by focusing on features, rather than discrete product types. Commenters supported the conciseness of the proposed provisions in the 2011 ANPRM, and asked for further streamlining where possible. Comments addressed a variety of other topics, which are discussed below in Section IV.E. (Rulemaking History – 2010 and 2011 ANPRMs: Significant Issues), and Section V (Major Issues).

E. 2010 and 2011 ANPRMs: Significant Issues

In this section, the Board collectively reviews the principle issues from the 2010 ANPRM and 2011 ANPRM in consolidated fashion.

1. Evolving Approach to Covered Electronic Content

Nearly two decades have passed since promulgation of the existing 508 Standards. Since that time, the types of—and uses for—electronic documents and other content have grown tremendously. This growth, coupled with the fact that the existing standards do not clearly spell out the scope of covered electronic content, led to inconsistencies in accessibility of electronic data and information across federal agencies. One of the goals of this rulemaking is thus to provide updated standards for electronic content that clearly delineate the accessibility requirements applicable to electronic content.

In the 2010 ANPRM, the Board proposed that, when federal agencies communicate using electronic content, that content would be required to comply with the revised 508 Standards when “(a) an official communication by the agency or a representative of the agency to federal employees which contains information necessary for them to perform their job functions; or (b) an official communication by an agency or a representative of the agency to a member of the public, which is necessary for them to conduct official business with the agency as defined by the agency’s mission.” Many commenters disagreed with this approach because, in their view, all agency communications would fall into one of the two categories, and therefore no content would be exempt. In addition, commenters feared that our approach would require each employee to be capable of creating accessible content for all of his or her own individual communications. According to the commenters, this, in turn, would require costly training without necessarily resulting in greater accessibility.

We responded to these concerns in the 2011 ANPRM by proposing that electronic content need be made accessible only if it both communicated official agency business to a federal employee or a member of the public and fell into one of nine specified categories: (1) content that is public facing; (2) content that is broadly disseminated throughout an agency, including templates; (3) letters adjudicating any cause within the agency’s jurisdiction; (4) internal or external program and policy announcements; (5) notices of benefits, program eligibility, and employment opportunities and decisions; (6) forms, questionnaires, and surveys; (7) emergency notifications; (8) formal acknowledgements and receipts; and (9) educational and training materials. This included all formats of official communications by agencies, including Web pages, postings on social media, and email. Our intent was to clarify what information and data would be required to be accessible without placing an undue burden on government communications and operations.

Commenters to the 2011 ANPRM generally supported this approach. However, one commenter expressed concern that limiting coverage of electronic content to certain specific categories could lead to a non-inclusive work environment for employees and that agencies would make accessible only that content covered by the 508 Standards to the exclusion of anything else. Some commenters recommended that the Board associate templates with forms in one category and differentiate that category from the category containing questionnaires and surveys. Several commenters—including federal agencies—found the language in the provision on content that was “broadly

disseminated” to be vague and overbroad, and requested that this provision be either revised or withdrawn.

Another key issue addressed in the Board’s advance notices of proposed rulemaking was the scope of exceptions to covered content. In the 2010 ANPRM, the Board proposed an exception for content stored solely for archival purposes or retained solely to preserve the exact image of the original hard copy. We retained that exception in the 2011 ANPRM, but added a second exception for “works in progress and drafts that are not public facing and that are intended for limited internal distribution.”

Commenters to the 2011 ANPRM raised many questions as to how those exceptions would apply. For example, some commenters expressed confusion about the exception for archival materials. Many commenters viewed “archival” as referring to content preserved in agencies’ internal information technology content management systems, rather than public records preservation generally, and asked us to clarify what the Board meant by the term. Other commenters expressed concern that otherwise accessible materials might be rendered inaccessible during the archiving process.

In addition to making significant revisions in the 2011 ANPRM to covered content under the proposed 508 Standards, the Board also amended our approach to content subject to the 255 Guidelines. We proposed that “electronic content integral to the use of ICT” covered by the 255 Guidelines must conform to Level A and Level AA Success Criteria and Conformance Requirements specified for Web pages in WCAG 2.0, as incorporated by reference in C102 (Referenced Standards). The Board received no comments on this provision in the 2011 ANPRM.

In this proposed rule, the Board clarifies areas of confusion and makes various other changes to the scope of covered electronic content. We discuss our approach in further detail in Section V.A (Major Issues – Electronic Content), Section VI.B (Section-by-Section Analysis – 508 Standards: Application and Scoping - E205), and Section VI.C (Section-by-Section Analysis – Technical Requirements - C203).

2. Treatment of WCAG 2.0

The Access Board and the World Wide Web Consortium (W3C)—the leading international standards organization for the World Wide Web—share a rich history of collaboration on guidelines for website accessibility. The existing 508 Standards and WCAG 1.0 were under development around the same time period in the late 1990s; WCAG 1.0 was finalized in May 1999, and the existing 508 Standards shortly thereafter in December 2000. The existing 508 Standards, § 1194.22—which addresses “Web-based Intranet and Internet Information and Applications”—has two endnotes, the first of which notes the Board’s view that eleven out of our sixteen provisions of the standards are consistent with Web Content Accessibility Guidelines (WCAG) 1.0 Priority 1 Checkpoints. The remaining five provisions in that section do not have close analogs to WCAG 1.0 Priority 1 checkpoints, but they strongly influenced the development of the next iteration of WCAG, WCAG 2.0.

As part of the 508 Standards refresh, the Advisory Committee recommended—and the Access Board agreed—that closer harmonization with WCAG 2.0 was necessary to promote greater accessibility. Consequently, in the 2010 ANPRM, the Board proposed to include most Level A and Level AA WCAG 2.0 Success Criteria. However, rather than using the text of relevant portions of WCAG 2.0 verbatim, the Board restated those Success Criteria in mandatory language thought to be better suited for a regulatory environment. Comments to the 2010 ANPRM identified three major problems with that approach. First, many expressed concern that rephrasing WCAG 2.0's Success Criteria would introduce discrepancies in, and fragmentation of, the 508 Standards. Second, other commenters feared that rephrasing of success criteria, rather than incorporating WCAG 2.0 by reference, would make dynamic linkages in the online version of WCAG 2.0 to important supplementary information less available to the reader. These commenters emphasized the usefulness of the online in-context hypertext links to robust guidance materials as aids for understanding and applying the WCAG 2.0 Success Criteria. Lastly, commenters found our division of provisions (including the many rephrased WCAG Success Criteria) into those respectively oriented towards either documents or software to be somewhat arbitrary and counterproductive.

In response to these comments, the Access Board substantially revised the approach to WCAG 2.0 in the 2011 ANPRM. We proposed to require all covered content to conform to WCAG 2.0, which would be incorporated by reference in the proposed 508 Standards.

Commenters generally voiced strong support for the Board's decision to incorporate by reference WCAG 2.0 and apply it to all types of covered ICT, rather than simply seeking harmonization between WCAG 2.0 and the proposed rule. While commenters expressed concern as to how closely WCAG 2.0 would apply to some types of content, they generally supported the concept of expanding the application of WCAG 2.0 to all types of Web and non-Web ICT. A few commenters, including representatives of the software industry, also suggested that the rule allow for compliance with any subsequent and, as yet unpublished, revisions to WCAG 2.0 by the W3C.

Some commenters, on the other hand, requested that the Board return to its previous approach in the 2010 ANPRM, rather than incorporate WCAG 2.0 by reference. Most of these commenters believed that this approach would make the Board's rule easier to use because the necessary text would be contained in a single document. Some of these commenters also asserted that the structure of WCAG 2.0 is confusing and makes it difficult to separate the normative and non-normative portions.

In this NPRM, the Board is retaining the Level A and Level AA Success Criteria and Conformance Requirements in WCAG 2.0 for all ICT subject to Sections 508 and 255, including documents and software. The Board also proposes, as in the 2011 ANPRM, to incorporate WCAG 2.0 by reference, rather than restating its requirements in the proposed rule. Incorporating the WCAG Success Criteria verbatim in the rule would be unhelpful because they are best understood within the context of the original source materials. WCAG 2.0 incorporates context-sensitive hypertext links to supporting advisory materials. The two core linked resources are Understanding WCAG 2.0 and

Techniques for WCAG 2.0. The first provides background information, including discussion of the intention behind each of the success criteria. The second provides model sample code for conformance. The linked expository documents, which is publicly available online free of charge, comprise a rich and informative source of detailed technical assistance and are updated regularly by standing working committees. These linked resources are not themselves requirements and agencies adopting WCAG 2.0 are not bound by them.

The Board cannot accept the suggestion of software industry representatives that the proposed rule permit compliance with any follow-on versions of WCAG 2.0. Federal agencies cannot “dynamically” incorporate by reference future editions of consensus standards.¹ Such action is legally prohibited since it would, among other things, unlawfully delegate the government’s regulatory authority to standards development organizations, as well as bypass rulemaking requirements (which would typically include a public notice-and-comment period). Federal agencies are required to identify the particular version of consensus standards incorporated by reference in a regulation. When an updated edition of a consensus standard is published, the agency must revise its regulation if it seeks to incorporate any of the new material. Nevertheless, the Access Board plans to remain abreast of updates to voluntary consensus standards bearing on ICT, and will consider incorporating them into future rulemakings, as appropriate.

We discuss incorporation of WCAG 2.0 in further detail below in Section V.B (Major Issues – WCAG 2.0 Incorporation by Reference), Section VI.B (Section-by-Section Analysis – 508 Standards: Application and Scoping – E205 and E207.2), and Section VI.C (Section-by-Section Analysis – 255 Guidelines: Application and Scoping - C203 and C205.2).

3. Relationship between Functional Performance Criteria and Technical Provisions

Over the years, agencies and other stakeholders had expressed confusion concerning the interaction between the technical requirements and functional performance criteria in the existing 508 Standards. To address this confusion, in the 2010 ANPRM, the Board proposed language to clarify that ICT may be deemed accessible if satisfying all applicable technical requirements, irrespective of whether the functional performance criteria had been met. In other words, the Board proposed that the technical requirements took precedence over the functional performance criteria in the sense that agencies should look first to applicable technical provisions, and only turn to the functional performance criteria when such requirements did not fully address the technology at issue. Commenters objected to this approach, citing the concern that ICT

¹ See, e.g., 1 C.F.R. § 51.1(f) (2014) (“Incorporation by reference of a publication is limited to the edition of the publication that is approved [by the Office of Federal Register]. Future amendments or revisions of the publication are not included.”); Office of Mgmt. & Budget, Exec. Office of the President, OMB Circular A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities (1998); see also Nat’l Archives & Records Admin., Federal Register Document Drafting Handbook, Ch. 6 (April 2014 Revision).

procurements satisfying only the technical requirements would not necessarily ensure sufficient access to individuals with disabilities.

We responded to this concern by proposing in the 2011 ANPRM that ICT be required to conform to the functional performance criteria in every case, even when technical provisions were met. We also proposed to use the functional performance criteria (as did the 2010 ANPRM) to evaluate equivalent facilitation. That is, a covered entity would have the option of applying the concept of equivalent facilitation in order to achieve conformance with the intent of the technical requirements, provided that the alternative afforded individuals with disabilities substantially equivalent or greater accessibility and usability than would result from compliance with the technical requirements.

Some commenters, such as those representing federal agencies, the disability community, and other interested parties applauded this approach. Other commenters representing industry objected, noting that functional performance criteria are subjective and cannot be tested objectively. Industry commenters stated that they could not guarantee that the functional performance criteria had been met unless they controlled all the components of the end-to-end solution.

In this NPRM, the Board is not proposing that the functional performance criteria apply in every case. However, the Board does propose application of the functional performance criteria (with some modifications) to determine equivalent facilitation (E101.2 and C101.2), and to assess accessibility when technical provisions do not address one or more features of ICT. The Board discusses this issue in further detail below in Section V.C (Major Issues - Functional Performance Criteria), Section VI.B (Section-by-Section Analysis - 508 Standards: Application and Scoping - E203 and E204), and Section VI.C (Section-by-Section Analysis – 255 Guidelines: Application and Scoping - C202).

4. Coverage of Real-Time Text

As noted previously, the existing 508 Standards and 255 Guidelines were promulgated nearly fifteen years ago. At that time, TTYs were the most commonly available text-based system for communicating within a voice communication system. Since then, technology has greatly advanced to the point where, in addition to TTYs, multiple text-based means of communication are available in the marketplace. One such emerging means of communication is real-time text technology. RTT technology provides the ability to communicate using text messages that are transmitted in near real-time as each character is typed, rather than as a block of text after the entire message is completed. RTT is important as an equivalent alternative to voice communications for persons who are deaf, or who have limited hearing or speech impairments. It allows the recipient to read the sender's text as soon as it is entered, thus making RTT more conversational and interactive, in a manner similar to a telephone conversation. This

also makes RTT particularly useful in an emergency situation when speed and accuracy of a message—or even a partial message—are critical.²

The Advisory Committee examined real-time text technology and recommended that the Board update the 508 Standards and 255 Guidelines to include specifications for RTT. More specifically, the Advisory Committee recommended that, when hardware or software provides real-time voice conversation functionality, it must provide at least one means of RTT communication. See TEITAC Report, Part 6, Subpt. C, Rec. 6-A. With respect to interoperability (i.e., operating outside a closed network), the Committee had two recommendations. First, the Advisory Committee recommended use of the TIA 825-A (Baudot) standard when ICT interfaces with the publicly switched telephone network (PSTN). Second, when ICT interoperated with VoIP products or systems using Session Initiation Protocol (SIP), the Advisory Committee did not recommend a specific standard, noting that there were several possible standards at that time (April 2008), such as RFC 4103, TIA 1001, and MSRP (RFC 4975). *Id.*

In keeping with the Advisory Committee's recommendation, the Board proposed in the 2010 ANPRM, to require ICT providing real-time voice communication to support RTT functionality. The Board also proposed prescriptive standards for RTT (e.g., transmission delay, error rates), as well as interoperability requirements. For interoperability with PSTN, the Board proposed (as did the Advisory Committee) use of the TIA 825-A (Baudot) standard. For ICT interoperating with VoIP products or systems using SIP, the Board did not propose a specific standard; instead, the Board proposed that such products or systems support transmission of RTT conforming to a "commonly used cross-manufacturer, non-proprietary standard." The Board considered referencing RFC 4103, but elected not to do so because, at that time, it was not thought to be a referenceable standard.

Commenters responding to the RTT-related proposals in the 2010 ANPRM generally supported RTT, but offered mixed views on the Board's proposed technical specifications. Commenters representing people with disabilities strongly supported inclusion of RTT functionality requirements in the proposed rule. They emphasized, among other things, that RTT represented a major advance by allowing persons with hearing- or speech-related disabilities to communicate through real-time text on mainstream devices, rather than having to use special and expensive devices (such as TTYs). They were critical, however, of the Board's decision not to incorporate a specific VoIP-related interoperability standard. Commenters representing people with disabilities (and also academia) urged the Board to adopt RFC 4103 for RTT

² Pursuant to the Twenty-First Century Communications and Video Accessibility Act of 2010, the FCC formed an Emergency Access Advisory Committee. In January 2012, the committee issued an "Emergency Access Advisory Committee (EAAC) Report and Recommendations." In the report, the committee discussed a number of policy and technical recommendations. These recommendations cover both interim and future action in Emergency Communications (see http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-312161A1.doc). In Appendix C to the report, the committee recommended that terminals offering real-time text conversation support ITU-T Recommendation T.140 and that text conversation be provided according to RFC 4103.

interoperating with VoIP using SIP, and provided information to support its use as a referenceable standard. Commenters from industry, on the other hand, encouraged the Board to take a cautious approach to RTT. They believed that, while RTT technology held promise as a major improvement in text communication (particularly in emergency situations), it was not sufficiently mature at that time to warrant adoption of a particular interoperability standard—including RFC 4103—for Internet-based calls. Commenters also objected to the proposed character and transmission delay rates as being overly prescriptive, thus potentially restricting the development of future technologies. (No commenters took issue with the Board's proposal to incorporate TIA 825-A as the standard for interoperability with PSTN.)

Based on these comments, in the 2011 ANPRM, the Board proposed to retain the references to the TIA 825-A standard for TTY signals on the PSTN, and to add a requirement for conformance with the RFC 4103 standard for VoIP products or systems using SIP. We did not retain the provisions specifying character and transmission delay rates. Overall, commenters largely supported the Board's revisions to RTT-related requirements in the 2011 ANPRM. However, several commenters representing industry and a local government agency asserted that RTT was not sufficiently mature or deployed widely enough to be useful. Some commenters also identified other standards aside from RFC 4103 that were currently in use (e.g., XMPP and XEP-0301) and could serve to facilitate RTT for Internet-based calls.

In this NPRM, the Board proposes to require that, where ICT provides real-time, two-way voice communication, such ICT must also support RTT functionality. Proposed 410.6 would require features capable of text generation to be compatible with real-time voice communication used on a network. ICT would be required to interoperate either within its own closed system or outside a network. For example, a closed communication system, such as within a federal agency, would be required to interoperate with either the publicly switched telephone network (PSTN) or Voice over Internet Protocol (VoIP) products or systems to support the transmission of real-time text. The Board believes that RTT is sufficiently mature as a technology (and has sufficiently proliferated in the current ICT marketplace) to warrant coverage in the proposed rule. For example, real-time instant messaging programs—such as Yahoo!® Messenger and AOL Instant Messenger's "Real-Time IM"—have, in the past, used proprietary protocols that were very similar to SIP.

Where federal agencies provide their employees with smartphones or similar technology, this NPRM would require such ICT to have the potential to communicate using RTT. The Board does not, however, thereby intend to require that all phone users (with or without disabilities) communicate using RTT in all circumstances. Similar to several other proposed accessibility features in the proposed rule, RTT must only be enabled and used when needed to ensure comparable access and use of ICT by persons with hearing disabilities. For example, federal managers will need to make clear that, when deaf or hard-of-hearing employees with agency-provided smartphones use RTT, coworkers without disabilities using agency smartphones will also need the RTT feature on their respective phones enabled. Such an approach ensures that communications among deaf and hearing coworkers are equally effective as voice

conversations among employees who do not have hearing impairments. Employees who do not need to communicate using RTT would otherwise be able to disable or ignore this feature.

The Board does not suggest that other forms of electronic communication—text or email, for example—would not be used by deaf employees and their colleagues. However, RTT offers many of the same benefits as voice communication. For example, a deaf attorney may need to seek the advice of his supervisor or colleagues during a break in a sensitive negotiation. Given the urgency and time-sensitive nature of the communications between employees, the deaf employee may request that his colleagues make themselves available during the negotiation by enabling RTT on their phones.

The Board did not consider proposing that agencies be permitted to provide RTT-enabled phones to employees only upon request. We did not consider this approach for two significant reasons. First, making accessible ICT available only upon request would run counter to Section 508's basic premise that information and data must be accessible to all employees without special treatment or the necessity for individualized treatment. Permitting issuance of RTT-enabled smartphones only when requested or deemed needed would be no different than permitting agencies to procure inaccessible ICT, such as a copy machine, where they have not identified a need for the accessible features among current staff. Second, while a proposal permitting agencies to issue non-RTT smartphones absent a special request for RTT features might modestly reduce an agency's ICT costs (to the extent, if any, that the purchase cost of RTT-enabled smartphones exceeds the cost of smartphones without this feature) and allow agencies to take user preferences regarding RTT into account, such an alternative would erode the proposed rule's benefits because employees with disabilities who need RTT would not be able to communicate with coworkers who are using government-issued, non-RTT smartphones.

Question 1. To realize the full potential benefits of the Section 508 proposal to require RTT functionality wherever an ICT product provides real-time, two-way voice communication, federal managers would need to direct their employees to keep the RTT features on their phones enabled when needed to accommodate employees with disabilities who use RTT, and federal employees would need to follow such directives. How would keeping RTT enabled on an "as needed" basis affect federal employees' use of texting? For example, would it cause them to substitute texting with other methods of communication? How can the Board analyze and quantify such effects?

Question 2. The benefits of the RTT proposal under Section 255 are dependent upon the extent RTT features would be enabled and used by the public. The public would not be required to use or keep the RTT features on their phones enabled. Is there available information regarding the extent the public would use RTT features if they were available on their phones? Would use of RTT be different for people with and without disabilities?

In terms of RTT standards, the Board is proposing to require that ICT interoperating with VoIP products using SIP must support the transmission of RTT that conforms to RFC 4103 (RTP Payload for Text Conversion (2005)). In the Major Issues section, the Board also seeks comment on whether additional standards for real-time text, which are in the process of being finalized (such as XEP-0301), should be referenced. See Section V.D, Question 8. We discuss RTT-related issues in further detail below in Section V.D (Major Issues – Real-Time Text), and Section VI.D (Section-by-Section Analysis – Technical Requirements and Functional Performance Criteria – section 410.6).

5. Interoperability Requirements for Assistive Technology

Assistive technology (AT) is hardware or software used to increase, maintain, or improve the functional capabilities of individuals with disabilities. Examples of assistive technology commonly used with computers include: screen readers, screen magnification software, specialized keyboards, refreshable braille displays, and voice recognition software. Assistive technology provides access beyond that offered by so-called “mainstream” hardware or software.

Compatibility with assistive technology is a foundational concept common to the existing 508 Standards and 255 Guidelines. ICT and assistive technologies must generally work together to provide users with necessary interface functions and features. The existing 508 Standards include general requirements for ICT to be compatible with assistive technology. Section 1194.21(b) requires that applications 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. Additionally, this section requires that applications not disrupt or disable activated features of any operating systems that are identified as accessibility features. Section 1194.21(b) is directed only to applications, and does not require assistive technology to be compatible with other assistive technology. Section 1194.21(d), moreover, obligates mainstream software to provide “sufficient information” about its user interface elements to assistive technology.

The existing 255 Guidelines, though taking a slightly different tact, also require mainstream products to be compatible with assistive technologies. Under these guidelines, telecommunications equipment must be compatible with “peripheral devices and specialized premises equipment commonly used by individuals with disabilities to achieve accessibility.” 36 CFR 1193.51. Compatibility is specified by provisions requiring: external access to controls and information needed for product operation, connection points for external audio processing devices, compatibility of controls with prosthetic devices, and TTY connectability and compatibility.

The existing 508 Standards and 255 Guidelines are, however, equally silent concerning whether (or how) their requirements apply to assistive technology. That is, while these standards and guidelines require ICT to interoperate with assistive technology, they do not directly regulate assistive technology. Over the years, this silence in the 508 Standards has led to confusion. We have thus viewed coverage of assistive technology

as a key issue throughout the process of updating the 508 Standards and 255 Guidelines.

The Advisory Committee, when addressing assistive technology, offered several perspectives. First, to improve ICT-AT compatibility, the committee recommended updated—and more comprehensive—technical standards that require mainstream computer operating systems and software with user interfaces to “expose” (i.e., make available at the underlying program level) accessibility information that facilitates use of assistive technology. For example, screen reading and voice recognition software may be used to emulate, respectively, the physical click of a mouse button or the keystrokes from a hardware keyboard. These ICT interoperability requirements were carefully crafted among the various stakeholders on the committee, as well as harmonized with an international consensus standard for software accessibility (ISO 9241-171 Ergonomics of human-system interaction - Part 171: Guidance on software accessibility (2008)). See TEITAC Report, Part 6, Subpt. C, Recs. 3-V & 3-U. Second, the committee debated—though could not reach consensus on—a recommendation obligating assistive technology to use (as applicable) the standardized set of accessibility information provided by mainstream operating systems and software, rather than taking customized approaches. See TEITAC Report, Part 7, Subpt. C, Rec. 3-VV.

In the 2010 and 2011 ANPRMs, which drew heavily from the TEITAC Report, the Board took similar approaches to assistive technology. These ANPRMs largely adopted the committee’s recommended set of updated technical standards governing the program-level accessibility information mainstream operating systems and software must make available to assistive technology. The Board also proposed to require assistive technology to use this accessibility information to achieve interoperability. Commenters generally applauded the Board’s proposed refresh of the interoperability requirements for mainstream operating systems and software, and viewed these requirements as a big step forward. Assistive technology vendors and trade organizations, however, uniformly objected to the imposition of requirements on assistive technology. They expressed a need to be wholly unconstrained to best serve consumers. They also expressed concern that accessibility services varied widely from platform to platform, and were often insufficient to support necessary features of their assistive technology products. All other commenter groups—including individuals with disabilities and the mainstream IT industry—advocated maintaining the minimal requirements for assistive technology included in the ANPRMs.

In this NPRM, the Board proposes to retain, with minimal changes, the technical interoperability requirements for mainstream operating systems and software from the prior ANPRMs. The Board also found commenters’ arguments for inclusion of minimal requirements for assistive technology to be compelling. Accordingly, the Board has also retained the proposal requiring assistive technology to use the basic set of accessibility information provided by operating systems and software to achieve interoperability. We discuss these issues in further detail below in Section V.E (Major Issues – Assistive Technology), and Section VI.D (Section-by-Section Analysis – Functional Performance Criteria and Technical Requirements – 502 and 401).

6. Modifications to the Functional Performance Criterion for Limited Vision

In order to ensure that ICT meets the needs of a wider range of users, the Board proposed in the 2010 ANPRM to revise the functional performance criterion for limited vision. The existing criterion specifies that ICT providing a visual mode of operation must furnish at least one accessible mode that accommodates visual acuity up to 20/70. The Board proposed to increase the covered acuity range to 20/200 (or a field of vision less than 20 degrees)—which is a common legal definition of blindness—to afford more individuals with disabilities the option of a visual mode of operation. Organizations representing persons with disabilities disagreed with the visual acuity proposed requirement, stating that it did not sufficiently address the needs of users with severe low vision. Industry groups suggested that the proposed visual acuity criterion contradicted several technical requirements. These commenters also indicated that our approach did not address features that could improve accessibility for persons with low vision, and were critical of the limitation that only one feature had to be provided for each mode of operation.

In response to these comments, in the 2011 ANPRM, the Access Board dispensed with specified measurements of visual acuity and relied instead on a functional approach reflective of the needs of users with low vision. We proposed that, when ICT provides a visual mode of operation, it must also provide at least one mode of operation that magnifies, one mode that reduces the field of vision, and one mode that allows user control of contrast. These modes would need to be supplied directly in the same ICT or through compatible assistive technology. Commenters to the 2011 ANPRM strongly approved of our approach to functional performance criteria for limited vision.

Accordingly, the Board proposes to retain this approach to functional performance criteria for limited vision in this proposed rule. We discuss the issue in further detail in Section VI.B (Section-by-Section Analysis – Section 508 Application and Scoping - E203), Section VI.C (Section-by-Section Analysis – 255 Guidelines Application and Scoping - C201.3), and Section VI.D (Section-by-Section Analysis – Functional Performance Criteria and Technical Requirements – 302.2).

7. Definition and Coverage of Technology with “Closed Functionality”

In its TEITAC Report, the Advisory Committee recommended that the Board make a nomenclature change to “closed functionality” from the existing term “self-contained, closed products” to better reflect a regulatory approach to ICT based on functionality, rather than type of product. The Advisory Committee observed that, due to technological changes since the promulgation of the existing standards and guidelines, some formerly “closed” product types were now open, while some formerly open product types were now closed—frequently by policy, rather than technological constraint. See TEITAC Report, Part 4, section 4.2. It suggested that when the functionality of a technology product is closed for any reason, including policy or technical limitations, then such product should be treated as having closed functionality.

In the 2010 ANPRM, the Board followed the Advisory Committee's recommendation and proposed to substitute the term "closed functionality" for "self-contained, closed products," as used in the existing 508 Standards. See 36 CFR 1194.4. While both terms refer to ICT with characteristics that limit its functionality, the term "closed functionality"—in the Board's view—better describes situations where the ICT is locked down by policy, rather than design. This may occur, for example, when an agency provides computers with core configurations that cannot be changed or adjusted by a user. We proposed permitting ICT to have closed functionality; however, such ICT still would need to be accessible to and usable by individuals with disabilities without assistive technology. Commenters did not object to the new terminology of "closed functionality" but asked for more detail and clarity in the applicable standards.

In the 2011 ANPRM, the Access Board proposed specific requirements for ICT with closed functionality to ensure accessibility to individuals with disabilities, which included a provision requiring ICT with closed functionality to be speech-output enabled. The term "speech-output enabled" means that the ICT can transmit speech output. These proposed requirements were derived from the Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines (ADA and ABA Accessibility Guidelines), 36 CFR Part 1191, Appendix D, section 707.5 Speech Output.

Commenters to the 2011 ANPRM generally supported our proposed requirement for "closed functionality," and the Board proposes to retain it in this proposed rule. We discuss the issue further in detail below in Section VI.D (Section-by-Section Analysis – Functional Performance Criteria and Technical Requirements - section 402).

8. Revisions to Exceptions under 508 Standards

In the 2010 ANPRM, the Board reorganized the exceptions in the existing 508 Standards and recommended deleting three others that were unnecessary or had led to confusion. The three exceptions proposed for deletion were: § 1194.3(c) (assistive technology at federal employees' workstations); § 1194.3(d) (access to agency-owned ICT in public locations); and § 1194.3(f) (ICT equipment in maintenance spaces or closets). By proposing deletion of these three exceptions, the Board intended only administrative changes to clarify the 508 Standards; there was no intent to narrow their scope or application.

First, with respect to § 1194.3(c), which provides that assistive technology need not be supplied at all federal employees' workstations, the Board proposed its deletion because, in essence, it provided an exception where none was needed, and thus led to confusion. There is no general rule in the existing 508 Standards that agencies provide assistive technology at all employee workstations; rather, these standards merely require compatibility with assistive technology when ICT is not directly accessible.

Second, the Board proposed deletion of § 1194.3(d) because it conveys the impression that the 508 Standards govern the locations where ICT must be made available to the public. The 508 Standards do not, in any way, control where ICT is located. Therefore, the exception was unnecessary.

Third, the Board proposed to delete the exception in 1194.3(f) for ICT equipment located in maintenance spaces or closets frequented only by service personnel for “maintenance, repair, and occasional monitoring of equipment.” We reasoned that, since maintenance spaces or closets are already exempted from accessibility requirements under section F203.6 of the Architectural Barriers Act (ABA) Standards, there was no need for a similar exception in the 508 Standards.

Commenters’ views on the proposed deletion of these three exceptions were mixed. On the one hand, most commenters supported removal of the exceptions pertaining to employee workstations and public availability of agency-owned ICT. On the other hand, however, many commenters objected to our proposed removal of the exception for ICT located in maintenance spaces since there are still many functions—particularly with respect to maintenance, repair, and monitoring—that, in the commenters’ view, could only be performed in maintenance spaces. In response to these comments, the Board has retained the exception for maintenance spaces in this NPRM, but proposes to limit its application to situations in which the controls for ICT functions are located in spaces that are frequented only by service personnel. This is consistent with the ADA and ABA Accessibility Guidelines, which exempt such spaces from accessibility requirements. However, where the functions of ICT located in maintenance spaces can be controlled remotely, this exception would not apply to such remote functions. These remote functions would still need to comply with applicable 508 Standards.

Lastly, in the 2010 ANPRM, the Access Board proposed to revise and relocate the exception in § 1194.3(b), which exempts ICT acquired by a contractor that is “incidental to a contract” from compliance with 508 Standards. Specifically, the Board proposed deleting the phrase “incidental to a contract” and relocating the exception to a new section relating to federal contracts. We did so in an effort to streamline and clarify the text of this exception. Commenters criticized this approach as confusing, particularly since the phrase “incidental to a contract” is a well-established term within the federal procurement community—a group that would likely be significantly impacted by the provision. Consequently, in the 2011 ANPRM, the Board proposed to restore the exception in § 1194.3(b) to its original language. We retain this approach in this NRPM, and thereby propose to exempt ICT acquired by a federal contractor that is “incidental to a contract” from compliance with the 508 Standards.

We discuss exception issues in further detail below in Section VI.B (Section-by-Section - 508 Standards: Application and Scoping - E202.3 and E202.4).

9. Broadening of Documentation Requirement for Undue Burden Exception

Section 1194.2 (a) (2) of the existing 508 Standards requires agencies to provide supporting documentation when determining that procurement of a compliant product would impose an undue burden. In the 2010 ANPRM, the Access Board proposed to broaden the undue burden documentation requirement so that it applied not only to ICT procurement, but also to other situations in which the 508 Standards applied—namely, the development, maintenance, or use of ICT. We did not receive any comments directly related to this approach, but did receive a few comments requesting clarification

of the factors to be addressed in the determination of undue burden. In the 2011 ANPRM, the Board retained the broadened scope of the undue burden documentation requirement, but clarified the factors to be applied in the undue burden calculus. We proposed that an agency would be required to consider the extent to which conformance would impose significant difficulty or expense in light of the resources available to the program or component for which the ICT is being procured, developed, maintained or used. Commenters generally supported this approach.

In this NPRM, in proposed E202.5.2, the Board retains the undue burden documentation requirement as proposed in the 2011 ANPRM. This proposed provision is discussed in detail below in Section VI.B (Section-by-Section Analysis - 508 Standards: Application and Scoping - E202.5.2).

F. Harmonization with European Activities

1. History

In 2006, as noted above, the Access Board convened a Telecommunications and Electronic and Information Technology Advisory Committee to review and update the existing standards and guidelines. The Advisory Committee met from 2006 to 2008. Four of the forty-one members of the Advisory Committee were international stakeholders: the European Commission, Canada, Australia, and Japan. Among other issues, the Advisory Committee addressed harmonization of standards across markets and worked closely with standard-setting bodies in the United States and abroad. The Advisory Committee issued its final report in 2008.

While the Access Board was in the process of updating its existing 508 Standards and 255 Guidelines, a similar process began in Europe to create the first European set of ICT accessibility standards. As a result of the 2005 EU-US Economic Initiative, the Access Board and the European Commission began to work closely on the issue of Information and Communications Technology standards (See: http://trade.ec.europa.eu/doclib/docs/2006/june/tradoc_127643.pdf).

In 2005, the European Commission released Mandate 376, "Standardisation Mandate to CEN, CENELEC, and ETSI in Support of European Accessibility Requirements for Public Procurement of Products and Services in the ICT Domain" (http://www.icts.org/Working_Groups/DATSCG/Documents/M376.pdf). The Mandate required the three European standards organizations—European Committee for Standardization (CEN), European Committee for Electrotechnical Standardization (CENELEC) and European Telecommunications Standards Institute (ETSI)—to: inventory European and international accessibility requirements; provide an assessment of suitable testing and conformity schemes; and, develop a European accessibility standard for ICT products and services along with guidance and support material for public procurements including an online toolkit.

In 2010, the Board released an ANPRM based on the 2008 TEITAC Report. We then published a second ANPRM in 2011 and took notice of the standardization work going on in Europe at the time, stating:

[T]he Board is interested in harmonizing with standards efforts around the world in a timely way. Accordingly, the Board is now releasing this second Advance Notice of Proposed Rulemaking (2011 ANPRM) to seek further public comment on specific questions and to harmonize with contemporaneous standardization efforts underway by the European Commission.

In February 2013, the European Commission published its draft standard EN 301 549 V1.0.0 (2013-02), “Accessibility requirements for public procurement of ICT products and services in Europe”

(http://www.etsi.org/deliver/etsi_en/301500_301599/301549/01.00.00_20/en_301549v010000c.pdf). The vote on the standard was completed in February 2014. The European Standard has been formally adopted by all three European standards organizations – CEN, CENELEC, and ETSI. The standards are now available to the target audience, government officials, who may use the standards as technical specifications or award criteria in public procurements of ICT products and services. The standard harmonizes and facilitates the public procurement of accessible ICT products and services within Europe. More information is available at: <http://www.mandate376.eu/>

2. Comparison of Proposed Rule with EN 301 549 Standard

a. General Comparison: Approach, Terminology and Organization

In this NPRM, the Board makes several proposals that are similar to those in the most recently published EN 301 549. Both the proposed rule and EN 301 549 address the functions of technology, rather than categories of technologies. Similarly, both offer technical requirements and functional performance criteria for accessible ICT. For example, our use of the phrase “information and communication technology” (ICT) in this NPRM, as a replacement of the existing term “electronic and information technology,” originates in the common usage of ICT throughout Europe and the rest of the world. Moreover, both documents are organized in similar ways, in that they both have initial scoping and definitions chapters, followed by separate chapters containing technical requirements and functional performance criteria.

Organizationally, the documents differ in several respects. These general differences are outlined in Table 2 below:

Table 2 - Formatting differences between the NPRM and EN 301 549

Differences	ICT NPRM (2014)	EN 301 549 V1.1.1 (2014-02)
Number of chapters Note: EN 301 549 breaks out several sections as separate chapters which are combined in the ICT NPRM	6	13
	Chapter 1 – Application and Administration	Chapter 2 – References Chapter 3 – Definitions and Abbreviations
	Chapter 2 – Scoping Requirements	Chapter 1– Scope Chapter 10 – Documents
	Chapter 3 – Functional Performance Criteria	Chapter 4 – Functional Performance Criteria
	Chapter 4 – Hardware	Chapter 5 – Generic Requirements (Biometrics, volume control, receipts and tickets, closed functionality, assistive technology) Chapter 6 – ICT with two way voice communications Chapter 7 – ICT with video capabilities Chapter 8 – Hardware
	Chapter 5 – Software	Chapter 9 – Web content Chapter 11 – Non-Web software
	Chapter 6 – Support Documentation and Services	Chapter 12 – Documentation and support services
Unique chapters	No comparable chapter	13 – Relay and Emergency Services
	<ul style="list-style-type: none"> Incorporated by reference (Sections E207.2 and C205.2) 	Annex A – Copy of WCAG 2.0
	<ul style="list-style-type: none"> Similar comparisons are found in the TEITAC Report 	Annex B – Charts showing relationships between requirements and functional performance criteria
	<ul style="list-style-type: none"> Not within the scope of Section 508 or Section 255; Section 508 compliance is determined by each federal agency 	Annex C – Determination of Compliance

Differences	ICT NPRM (2014)	EN 301 549 V1.1.1 (2014-02)
	<ul style="list-style-type: none"> Not within the scope of Section 508 or Section 255 Most similar to “303 Changes in Level” from the 2010 ADA Standards for Accessible Design 	Section 8.3.2 Clear floor space Section 8.3.2.1 Change in level Section 8.3.2.2 Operating area
Differing treatment of similar concepts	Section 410.6 Real-Time Text Functionality Discussed more fully	Section 6.3 Real-time text (RTT) functionality Discussed more fully
	410.8 Video Communication Discussed more fully	6.6 Video Communication Discussed more fully

b. Specific Examples: Differing Treatment of Similar Concepts

Real-Time Text Functionality

In this NPRM, the Board proposes that where ICT provides real-time voice communication, it must also support real-time text (RTT) functionality, as described in 410.6. Most significantly, the Board proposes to require that where ICT interoperates with Voice over Internet Protocol (VoIP) products using Session Initiation Protocol (SIP), it must support the transmission of RTT that conforms to RFC 4103 (RTP Payload for Text Conversion (2005)). In the Major Issues section, the Board asks whether additional standards for real-time text, which are in the process of being finalized (such as XEP-0301), should also be referenced. See Section V.D, Question 8. The proposed rule limits the approach to RTT by proposing to only incorporate by reference a maximum of two standards for RTT interoperating with VoIP.

In contrast, EN 301 549 allows the use of multiple standards for RTT. In addition to referencing RFC 4103 (section 6.3.3(b)), it permits the use of four other standards and an unspecified “common specification” for RTT exchange. The only criterion in the common specification is that it must indicate a method for indicating loss or corruption of characters. For a further discussion of RTT functionality, see Section V.D (Major Issues - Real-Time Text) below.

We are not proposing to adopt the other four standards referenced by EN 301 549 because they are not applicable to the type of technology used in the United States. Just as mobile phones are not directly compatible between the United States and Europe (i.e., CDMA phone systems versus GSM (Global System Mobile)), portions of the four standards referenced in EN 301 549 are simply not relevant in the U.S. market, and there are no indications that they will have domestic relevance in the near future.

The standards referenced by EN 301 549 address more than just real-time text functionality. Some are quite broad and address several communications features,

such as video speed and accuracy. One example of such a standard is ETSI TS 126 114 (Universal Mobile Telecommunications System (UMTS)) which covers voice, video, and data transmission rates and speeds. This standard supports an approach to communication known as “total communication.” We are not proposing to adopt this approach. In the 2010 ANPRM, the Board proposed transmission accuracy rates and speeds for video, text and voice data, based on recommendations from the Advisory Committee. In response, we received numerous comments questioning the accuracy of the proposed rates, the sources for the proposals and the research underlying the proposed rates. Consequently, the Board removed those proposals in the 2011 ANPRM.

Question 3. We are seeking further information on the benefits and costs associated with adopting standards that address total communications, including voice, video, and data transmission rates and speeds. We seek recommendations for specific standards that the Board might reference to address total communication.

Video Communication

In this NPRM, the Board proposes that where ICT provides two-way voice communication that includes real-time video functionality, the quality of the video must be sufficient to support communication using sign language (section 410.8). The provision specifies a desired outcome and does not provide specific technical requirements. This approach resulted from public comments in response to our proposal in the 2010 ANPRM. Public commenters noted there were no existing standards supporting the technical requirements the Board had proposed concerning resolution, frame rates, and processing speed. In the 2011 ANPRM, the Board elected to remove those proposed technical requirements in favor of simply requiring the quality of the video to be sufficient to support communications using sign language. We received no comments on this approach, and retain it here in this NPRM.

EN 301 549, on the other hand, takes a different tact. In “6.6 Video Communication,” the standard specifies numeric measurements for such features as resolution (6.6.2), frame rates (6.6.3) and alternatives to video-based services (6.7). This approach is similar to our proposal in the 2010 ANPRM, which, as noted, the Board dropped due to significant negative comments.

In general, the approaches taken in EN 301 549 and this NPRM are similar and complimentary. The Access Board’s proposed rule contains less detail in some proposed provisions, as discussed above. We elected to pursue this course in response to public comments and our desire to make use of a number of voluntary consensus standards by incorporating them by reference. This approach will result in better harmonization of accessibility standards worldwide.

V. Major Issues

The five major issues addressed in this NPRM are: (a) scope of covered electronic content; (b) incorporation by reference of WCAG 2.0; (c) relationship between functional

performance criteria and technical requirements; (d) coverage of real-time text; and (e) interoperability requirements for assistive technology. Each of these areas is discussed below.

A. Electronic Content

In this NPRM, the Board aims to bring needed clarity to the scope of electronic content subject to accessibility requirements in the 508 Standards. Based on the language of the Rehabilitation Act, § 1194.1 of the existing standards speaks of federal agencies ensuring that federal employees and members of the public with disabilities have comparable “access to and the use of [electronic] information and data.” Given its breadth, federal agencies have—not altogether surprisingly—had difficulty applying this mandate. The existing requirement does not adequately address what is meant by comparable access to information and data. Consequently, there has been confusion over whether and how such electronic content must be made accessible. Agencies have been reluctant to apply the existing 508 Standards to electronic information and data, except for Web pages.

The proposed rule would address these deficiencies in the existing 508 Standards by clearly delineating the scope of covered electronic content, as well as specifying concrete, testable, technical requirements to ensure the accessibility of such content. The Board proposes that all covered electronic content would be required to conform to WCAG 2.0 Level A and Level AA Success Criteria and Conformance Requirements specified for Web pages or, where applicable, ISO 14289-1 (PDF/UA-1).

Covered electronic content would, under the proposed rule, include two discrete groups of content. First, the Board proposes in E205.2 that all public-facing content—which encompasses electronic information and data made available by agencies to members of the general public—must satisfy applicable accessibility requirements in the proposed rule (i.e., WCAG 2.0 Level A and Level AA Success Criteria or PDF/UA-1). This would include, for example, agency websites (and documents posted thereon), blog posts, and social media sites. Coverage of this broad category of agency-sponsored content is important because persons with disabilities should have equal access to electronic information and data made available to the public generally. This is an essential right established by the Rehabilitation Act.³

The central principle underlying the accessibility requirement for public-facing content is the notion that federal agencies must ensure equal access to electronic information that they themselves directly make available to the general public by posting on a public fora. So, for example, if a federal agency posts a PDF version of a recent settlement agreement on its website as part of a press release, that document would need to comply with PDF/UA-1. Or, if an agency posts a video created by an advocacy organization on the agency’s website (or, alternatively, on a social media site hosted by

³ An analogous provision in proposed C203.1 would require telecommunications equipment manufacturers to make content integral to the use of ICT conform to WCAG 2.0 or PDF/UA-1.

a third party), the agency would also be required to ensure that that electronic information complied with accessibility requirements in proposed E205.2 for public-facing content. On the other hand, if a federal agency is the plaintiff in a lawsuit and serves an electronic version of a legal brief on a corporate defendant, the agency's legal brief would not be considered public-facing content even if the corporation subsequently posts a copy of the agency's document on its own website.

Second, with respect to electronic content that is not public facing, the Board aims to limit the scope of covered content to eight discrete categories of agency official communications that are most likely to affect a significant number of federal employees or the general public. Proposed E205.3 would require an agency's non-public facing electronic content to meet the accessibility requirements in the proposed rule (i.e., WCAG 2.0 Level A and Level AA Success Criteria or PDF/UA-1) when such content (a) constitutes agency official business, and (b) falls within one or more of eight categories of communication. Coverage would extend to all forms of content constituting official communications by agencies, including Web pages, postings on social media, emails, and electronic documents. The Board believes that this approach strikes an appropriate balance in ensuring the accessibility of essential electronic content for persons with disabilities, while also tempering agency compliance obligations. This approach also compliments the requirements of sections 501 and 504 of the Rehabilitation Act, which require agencies to provide reasonable accommodations as necessary to address the disability-related needs of employees and the public respectively.

Specifically, proposed E205.3 sets forth the following eight categories of non-public facing agency official communications that must satisfy the accessibility requirements in the proposed 508 Standards: (1) emergency notifications (e.g., an evacuation announcement in response to fires or other emergencies); (2) initial or final decisions adjudicating administrative claims or proceedings; (3) internal or external program or policy announcements (i.e., information promulgated by an agency relating to programs it offers or policy areas it deals with); (4) notices of benefits, program eligibility, employment opportunities or personnel actions; (5) formal acknowledgements or receipts (i.e., official replies by an agency that recognize the receipt of a communication); (6) questionnaires or surveys; (7) templates or forms; and (8) educational or training materials.

By limiting the scope of covered electronic content to these proposed eight categories of official communications, the Board intends to encourage agencies to do more to ensure that individuals with disabilities have comparable access to, and use of, electronic information and data. The Board does not intend this proposed approach to disturb or override the independent legal obligations of agencies—whether arising under sections 501 or 504 of the Rehabilitation Act or other statutes—to provide accessible communications as a reasonable accommodation or other required accommodations. For example, draft electronic documents exchanged by federal employees as part of an agency working group would not be covered by proposed E205.3, but might still be required to be accessible by Section 501 when needed by a federal employee with a disability to perform his or her job.

Question 4. Are the eight proposed categories of non-public facing content sufficiently clear? Do they ensure a sufficient level of accessibility without imposing an unnecessary burden on agencies? If not, the Board encourages commenters to suggest revisions to these categories that would improve clarity or strike a more appropriate balance.

Notably absent from the proposed eight categories of non-public facing content is a type of content—namely, content “broadly disseminated throughout an agency”—that was included in the 2011 ANPRM. Several federal agencies and other commenters found this language to be vague and overbroad, and called for its revision or withdrawal. The Board acknowledges that the “broadly disseminated” category could, in practice, prove challenging to apply and lead to inconsistent implementation across agencies that the proposed 508 Standards are designed to address. Accordingly, the Board has not included “broadly disseminated” content as a category in the proposed rule. The Board nonetheless welcomes comment on this issue, and may include a “widely disseminated”-style category in the final rule should there prove to be a workable definition or metric to assess compliance.

Question 5. Should a category for “widely disseminated” electronic content be included among the categories of non-public facing official communications by agencies that must meet the accessibility requirements in the 508 Standards? Why or why not? If such a category were to be included in the final rule, what metrics might be used to determine whether a communication is broadly disseminated throughout an agency?

Lastly, with respect to exceptions, the Board proposes in this NPRM an exception in E205.3 for non-public facing records maintained by the National Archives and Records Administration (NARA) for archival purposes under federal recordkeeping requirements. As proposed, such content—even if otherwise meeting the conditions in proposed E205.3 for electronic content that must be made accessible (i.e., non-public facing agency official communications that fall within one or more of the eight enumerated categories)—would not be required to comply with the proposed 508 Standards so long as it remained non-public facing. The Board anticipates that the only content covered by this exception would be non-public facing archival materials administered or maintained by NARA in compliance with federal recordkeeping requirements, such as the Federal Records Act (codified at 44 U.S.C. Chapters 21, 29 and 33). It bears noting that NARA is not generally responsible for remediating inaccessible materials submitted to NARA by other agencies unless such materials are made publicly available by, for example, being posted on NARA’s website.

Though the 2011 ANPRM included an express exception for draft materials, no such exception is included in either proposed E205.2 (Public Facing) or E205.3 (Agency Official Communications) for two main reasons. First, public-facing content—such as that covered by proposed E205.2—should be equally accessible to all members of the public regardless of whether it is in draft or final form. For example, a draft policy published for comment on an agency website should be accessible so that all affected individuals may provide feedback. Secondly, drafts, by their very nature, would typically fall outside the scope of the eight categories of content constituting agency official

communications subject to proposed E205.3. Only final electronic documents that are ready for distribution would qualify as the type of content identified in proposed categories 1 through 8 of this provision. For example, a draft memorandum by an agency component announcing a new telework policy would not constitute a “policy announcement” (Category 3) subject to proposed E205.3 until it is finalized and ready to be transmitted to its intended audience of component employees.

B. WCAG 2.0 Incorporation by Reference

As noted above, the Board proposes in this NPRM to incorporate by reference WCAG 2.0. In the following sections, the Board discusses the rationale for, and certain issues related to, incorporation of this consensus standard.

1. Rationale for Incorporation by Reference

We have four principal reasons for incorporation by reference of WCAG 2.0. They are as follows:

First, our approach is consistent with that taken by other international standards organizations dealing with this issue. Standards developed in Australia, New Zealand, and Canada already directly reference WCAG 2.0. Moreover, WCAG 2.0 serves as the basis for Web accessibility standards in Germany (under “BITV 2”), France (under “RGAA 2.2.1”) and Japan (under “JIS X 83141”) and has so far generated eight formal authorized translations. In addition, the European Commission references WCAG 2.0 in EN 301 549.

Second, incorporation by reference of WCAG 2.0 is consistent with section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note), as well as Office of Management and Budget (OMB) Circular A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities (1998), which direct agencies to use voluntary consensus standards in lieu of government-unique standards except where inconsistent with law or otherwise impractical. See http://www.whitehouse.gov/omb/circulars_a119.⁴

Third, our approach is consistent with that being taken by another federal agency addressing a similar topic, namely the Department of Transportation’s recent final rule addressing, among other things, the accessibility of air carrier and ticket agent websites.

⁴ OMB is in the process of updating Circular A-119. See Request for Comments on a Proposed Revision of OMB Circular No. A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities, 79 FR 8207 (proposed Feb. 11, 2014). In its request for comment, OMB stated: “The revised Circular would maintain a strong preference for using voluntary consensus standards in Federal regulation and procurement. It would also acknowledge, however, that there may be some standards not developed using a consensus-driven process that are in use in the market—particularly in the information technology space—and that may be relevant (and necessary) in meeting agency missions and priorities.”

See Nondiscrimination on the Basis of Disability in Air Travel, 78 FR 67882 (Nov. 12, 2013).

Fourth, incorporation of WCAG 2.0 directly serves the best interests of Americans with disabilities because it will help accelerate the spread of Web accessibility. The accessibility of the Web is essential to enable the participation of individuals with disabilities in today's information society.

2. Justification for Applying WCAG 2.0 to Non-Web ICT

The Access Board is proposing to require not only Web content to conform to the Level A and Level AA Success Criteria and Conformance Requirements in WCAG 2.0—an approach with which commenters to the 2010 and 2011 ANPRMs unanimously agreed—but also software and non-Web documents. Several commenters to the 2011 ANRPM were critical of this approach, and questioned the propriety of applying WCAG 2.0 to non-Web ICT. For the reasons noted below, the Board believes that applying WCAG 2.0 outside the web browser environment not only ensures greater accessibility for persons with disabilities, but also minimizes the incremental burden on regulated entities by simplifying compliance through incorporation of a technologically-neutral consensus standard.

Because WCAG 2.0 was written to be technology neutral, the language and phrasing of the Success Criteria can be applied to any technology found on the Web. Since most file types are found on the Web and much software is now Web-enabled, it is reasonable to utilize WCAG 2.0 to evaluate off-line documents and software interfaces with straightforward substitution of terms to address this new application. This approach has the potential to significantly simplify accessibility conformance and assessment.

We find support for our approach from two other sources, namely the European Commission's Standardization Mandate M 376 (M376) of March 2012 and the World Wide Web Consortium's WCAG2ICT Task Force ("Task Force"). The W3C formed the Task Force in June 2012 in part to address reservations, expressed by some of the commenters to our 2011 ANPRM, about applying the criteria for accessible Web content to off-line documents and software. W3C invited participation from subject-matter experts from around the world, including representatives of federal agencies and others who had concerns with our approach. The Task Force's final consensus report provides guidance concerning application of WCAG 2.0 to non-Web ICT, specifically non-Web documents and software. See W3C Web Accessibility Initiative, WSC Working Group Note - Guidance on Applying WCAG 2.0 to Non-Web Information and Communications Technologies (Sept. 5, 2013), available at <http://www.w3.org/TR/wcag2ict/>.

The Task Force analyzed each of the WCAG 2.0 Success Criteria to determine their suitability for application to non-Web content. There are thirty-eight Level A and Level AA Success Criteria in WCAG 2.0. The Task Force found that the majority of Success Criteria from WCAG 2.0 can be applied to non-Web documents and software with no, or

only minimal, changes. Specifically, twenty-six Success Criteria do not include any Web-related terms and, therefore, can be applied directly as written and as described in the “Intent” sections of the most current version of “Understanding WCAG 2.0.” Thirteen of these twenty-six can be applied without any additional notes. The other thirteen also can be applied as written, but the Task Force provided additional informative notes in its report for the sake of clarity.

Of the remaining twelve Success Criteria, the Task Force found that eight of them can be applied as written when certain Web-specific terms or phrases like “Web page” are replaced with non-Web terms or phrases like “non-Web documents and software.” Additional notes are provided in the Task Force report to assist in the application of these Success Criteria to non-Web ICT. One example is Success Criterion 2.4.5 Multiple Ways. The Task Force noted that, when applied to the non-Web environment, this criterion requires that there be more than one way to locate a document (or software program) within a set of documents or programs. For mobile devices, this criterion could be satisfied by an operating system that makes files locatable by directory and search functions—features that are nearly ubiquitous among mobile operating systems in use today.

Another example is Success Criterion 3.2.3 Consistent Navigation. For this criterion, the Task Force noted that application to the non-Web environment would require consistency among navigational elements when such elements were repeated within sets of documents or software programs. To be conformant, navigational elements would be required to occur in the same relative order each time they are presented. It is unlikely that authors would provide navigation elements for a set of related documents and then present them differently from document to document, thereby defeating their purpose.

The Task Force’s report also notes that applying the success criteria in WCAG 2.0 to non-Web ICT with closed functionality proves problematic when a success criterion assumes the presence of assistive technologies, since closed functionality—by definition—does not allow attachment or use of assistive technology. This might occur, for example, when an eBook allows assistive technologies to access all of the user interface controls of the eBook program (open functionality), but does not allow such technologies to access the actual content of books (closed functionality). The Task Force identified 14 success criteria for which compliance might prove challenging for developers of ICT products with closed functionality. We propose to resolve this issue by exempting ICT with closed functionality from certain WCAG 2.0 Success Criteria, in conjunction with the addition of requirements specific to such products in Chapter 402, Closed Functionality.

By incorporating WCAG 2.0 by reference, the proposed standards would provide a single set of requirements for websites, documents, and software. WCAG 2.0 addresses new technologies and is responsive to the fact that the characteristics of products (e.g., native browser behavior and plug-ins and applets) have converged over time. Today, there are fewer distinctions among product categories, and some are outdated. For example, modern smartphones include: software applications and

operating systems, Web-based intranet and Internet information and applications, and video and multimedia products. Additionally, smartphones are portable computers, telecommunications products, and self-contained closed products. New requirements in WCAG 2.0 also address gaps in the existing 508 Standards. Examples include: a requirement for a logical reading order, the ability to resize text, and the ability to turn off background audio that might interfere with comprehension and screen reading software.

3. Comparison of WCAG 2.0 to Existing 508 Standards

While the WCAG 2.0 Success Criteria build on the heritage of the existing 508 Standards, they are generally more explicit than the standards. Careful attention was given during their development to ensure that the Success Criteria are written as objectively testable requirements. In addition, unlike the existing 508 Standards, WCAG 2.0 is written in a technologically neutral fashion, which makes it directly applicable to a wide range of content types and formats.

For example, operability of ICT through keyboards (or alternate keyboard devices) is often critical to accessibility. Persons who are blind or who have limited vision often use screen readers to navigate Web pages using only the keyboard. Keyboard operability is also essential for many individuals with motor impairments who use alternate keyboards, or input devices that act as keyboard emulators when accessing ICT because they find mouse pointing to be cumbersome or impossible. Keyboard emulators include voice recognition software, sip-and-puff software, and on-screen keyboards. The existing 508 Standards envision keyboard operability from both software and Web-based information or applications, but such requirements were not necessarily explicit. Section 1194.21(a) expressly mandates that, when software is designed to run on a keyboard, all product functions must generally be executable through a keyboard. With respect to Web-based information and applications, the 508 Standards are not so explicit. At the time these standards were promulgated, Web pages created with HyperText Markup Language (HTML[®]) were always keyboard operable. Therefore, an express requirement for keyboard operability by Web pages was unnecessary. The existing 508 Standards expressly require keyboard operability for Web pages that require applets and plug-ins to interpret page content since keyboard operation in these contexts was not ubiquitous. See 36 CFR 1194.22(m). Collectively, the existing 508 Standards thus address keyboard operability both within and outside the Web environment, but do so in a variety of ways.

Over the years, however, Web technologies have become more complex. Use of keyboards is often secondary to mouse or touch-only interfaces. Success Criterion 2.1.1 requires all functionality to be operable through a keyboard interface. Section 1194.21(a) of the existing 508 Standards requires that “[w]hen 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.” This current wording is phrased as an input requirement based on output, and it leaves “discerned textually” as an undefined term. These are both flaws that may create accessibility gaps in application. For example, an operating system feature like “mouse keys” (where the keyboard cursor keys are used to steer the mouse

pointer) satisfies this provision on its face, even though that feature is of no use to someone who cannot see the screen and relies on screen reading software. Success Criterion 2.1.1, on the other hand, while longer, only references input and uses no special jargon. This success criterion reads: “All functionality of the content [must be] 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.”

The Access Board has created a comprehensive table comparing WCAG 2.0 Level A and AA Success Criteria to the corresponding requirements in the existing 508 Standards. The table can be found on our website at www.access-board.gov/wcag2-508. In this table, the Board has identified WCAG 2.0 success criteria as either “substantially equivalent” or “new” relative to the existing 508 Standards. Identification of a WCAG 2.0 success criterion as “new” indicates that it has no corresponding provision in the existing 508 Standards; rather, it addresses a deficiency with the existing 508 Standards as identified by the developers of WCAG. In most cases, agencies with Section 508 compliance testing processes have adapted their procedures to address these accessibility concerns.

In sum, there are 38 WCAG 2.0 Level A and AA Success Criteria. After careful comparison of these success criteria to the existing 508 Standards, the Access Board deems 22 success criteria to be substantially equivalent in substance to our existing standards. The Board estimates that agencies with content that meets this group of existing 508 Standards will incur no or minimal costs by virtue of incorporation of WCAG 2.0 into our proposed rule. For the remaining 16 success criteria the Board deems to be new, it is anticipated that agencies would, to a greater or lesser extent (depending on the content and criteria at issue), incur some costs when implementing WCAG 2.0.

Question 6. The Board seeks comment on the extent that the proposed incorporation of WCAG 2.0 Level A and Level AA Success Criteria would result in new costs or benefits. We have characterized the majority of success criteria as “substantially equivalent” to requirements under the existing 508 Standards and 255 Guidelines and request comment as to the accuracy of this characterization.

4. Proposed Updates to Other Web-Specific Provisions in Existing 508 Standards

Along with the incorporation by reference of WCAG 2.0, the Board also proposes to update six provisions in the existing 508 Standards related to Web content to account for technological changes or their respective obsolescence. These six provisions for which the Board proposes deletion or replacement are as follows:

We propose to replace § 1194.21(g) of the existing 508 Standards, which prohibits applications from overriding user-selected contrast and color selections and other individual display attributes, with a new section 503.2 User Preferences. As with § 1194.21(g), this proposed provision requires applications to permit user preferences from platform settings for display settings. However, proposed 503.2 also provides an

exception for applications—such as Web software—that are designed to be isolated from their operating systems. By design, Web applications (such as, for example, software used to create interactive multimedia content) are isolated from the operating system (i.e., “sand boxed”) for security reasons. An expectation that certain platform settings (e.g., font preferences) apply globally to all documents found on the Web is not practical.

We propose to delete § 1194.22(d) of the existing 508 Standards, which requires that Web documents be organized so they are readable without requiring an associated style sheet. Cascading style sheets (CSS) are now well supported by assistive technology and, consequently, this provision is unnecessary. For example, contemporary techniques using CSS to selectively hide irrelevant content from all users also selectively hides irrelevant content from users of assistive technology.

We propose to delete § 1194.22(k) of the existing 508 Standards, which permits text-only Web pages under certain circumstances, because incorporation of WCAG 2.0 success criteria renders this provision obsolete. While WCAG 2.0 does permit “conforming alternate versions,” text-only pages could not provide equivalent information or functionality for all but the most trivial Web content. The WCAG requirement for a conforming alternate version significantly exceeds the expectations for text only pages.

Question 7. A Web page can conform to WCAG 2.0 either by satisfying all success criteria under one of the levels of conformance or by providing a conforming alternate version. WCAG 2.0 always permits the use of conforming alternate versions. Are there any concerns that unrestricted use of conforming alternate versions of Web pages may lead to the unnecessary development of separate Web sites or unequal services for individuals with disabilities? Should the Board restrict the use of conforming alternate versions beyond the explicit requirements of WCAG 2.0? The Board requests that responses be provided in the context of the WCAG definition for conforming alternate versions (><http://w3.org/TR/WCAG20/#conforming-alternate-versiondef>). Commenters should review the guidance material as to why conforming alternate versions are permitted (><http://w3.org/TR/UNDERSTANDING-WCAG20/conformance.html#uc-hyperpermit-head>).

We propose to delete § 1194.22(l) of the existing 508 Standards, which applies when pages utilize scripting languages to display content or to create interface elements and requires the scripted information to be identified with functional text that can be read by assistive technology. Because WCAG 2.0 is technology neutral, inclusion of a separate provision applicable to scripting languages would be redundant; the same requirements that apply to HTML and other Web technologies also apply to scripting languages.

We propose to delete § 1194.22(m) of the existing 508 Standards, which applies when a Web page needs an applet, plug-in, or other application present on the client system to interpret page content and requires that such page provide a link to a plug-in or applet that complies with other referenced standards (in § 1194.21) relating to software

applications. Because WCAG 2.0 applies directly to applets, plug-ins, and Web applications, § 1194.22(m) is redundant.

Lastly, the Board proposes to delete § 1194.24(e) of the existing 508 Standards, which requires that the non-permanent display or presentation of alternate text presentation or audio descriptions be user-selectable. Section 1194.24(e) essentially duplicates requirements for video and multimedia products already set forth in other provision in the same section (i.e., subsections (c) and (d)). The provision for user selectable closed captions and audio description restates existing practice, so it is unnecessary.

C. Functional Performance Criteria

The functional performance criteria are outcome-based provisions that address barriers to using ICT by individuals with certain disabilities, such as those related to vision, hearing, color blindness, speech, and manual dexterity. Both the existing 508 Standards and 255 Guidelines provide functional performance criteria. However, the existing 508 Standards do not expressly define the relationship between its functional performance criteria and technical requirements. To address this gap, the Board proposes to clarify when application of the functional performance criteria in the 508 Standards is required. (We are not proposing to change the application of the functional performance criteria in the 255 Guidelines.) The Board also proposes, in this NPRM, to update several functional performance criteria in Chapter 3 to refine some criteria and to make editorial changes necessitated by revisions elsewhere in the proposed rule.

1. Application of Functional Performance Criteria: 508 Standards

Section 1194.31 of the existing 508 Standards, which sets forth six specific functional performance criteria, does not specify when federal agencies and other covered entities should or must apply these criteria. As described in the preamble to the final rule for the existing standards:

This section [1194.31] provides functional performance criteria for overall product evaluation and for technologies or components for which there is no specific requirement under other sections. These criteria are also intended to ensure that the individual accessible components work together to create an accessible product. (65 FR 80519 (Dec. 21, 2000))

Over the ensuing years, some have raised questions about application of the functional performance criteria in the existing 508 Standards. The General Services Administration's IT Accessibility and Workforce (GSA/ITAW)—which is the federal government's principal coordinator for Section 508 implementation—provides the following information in a “Q &A” format concerning application of the functional performance criteria:

How should an agency proceed in identifying “applicable” technical provisions in Subparts B [technical provisions], C [functional performance criteria], and D [information, documentation, and support] of the Access

Board's standards to ensure acquired products provide comparable access?

Agencies should first look to the provisions in Subpart B [technical provisions] to determine if there are specific technical provisions that apply to the [ICT] need they are seeking to satisfy.

If there are applicable provisions in Subpart B [technical provisions] that fully address the product or service being procured, then the agency need not look to Subpart C [functional performance criteria]. Acquired products that meet the specific technical provisions set forth in Subpart B [technical provisions] will also meet the broader functional performance criteria in Subpart C [functional performance criteria].

If an agency's procurement needs are not fully addressed by Subpart B [technical provisions], then the agency must look to Subpart C [functional performance criteria] for applicable functional performance requirements.⁵

The GSA/ITAW's Q&A document also suggests that the functional performance criteria in the existing 508 Standards be used to evaluate ICT products for equivalent facilitation. *Id.*

As recounted previously, the Board's approach to specifying requirements for application of the functional performance criteria has evolved over the course of this rulemaking. The Advisory Committee recommended that the Board clarify the relationship between the functional performance criteria and the technical provisions in the 508 Standards, but did not reach consensus on how to address this issue. In the 2010 ANPRM, the Board proposed to use the approach suggested in the GSA/ITAW's Q&A document—namely, that agencies first look to the technical provisions in the 508 Standards to determine whether there were specific provisions that applied to the ICT being procured. If there were technical provisions that fully addressed the ICT being procured, then the agency would not need to apply the functional performance criteria. Application of the functional performance criteria would thus only be required under the following two circumstances: when the agency's procurement needs were not fully addressed by technical provisions in the 508 Standards, or when evaluating ICT for equivalent facilitation. This proposal was intended to reflect current agency practice.

Concerns expressed by commenters led the Board to propose redefining the relationship between the functional performance criteria and the technical provisions in the 508 Standards. In the 2011 ANPRM, the Board proposed that ICT would be required to conform to the functional performance criteria, even when the technical provisions were met. This proposal, too, received mixed reviews from commenters. While some commenters supported this approach, industry groups objected to it as unworkable. They viewed the functional performance criteria as overly subjective and

⁵ General Services Admin., Section 508 Frequently Asked Questions 11 (Jan. 2014) (response to Question B.2.ii), available at http://section508.gov/Section508_FAQs.

not subject to objective testing. As one commenter from the IT industry noted: “[A] supplier cannot guarantee that the functional performance criteria have been met unless the supplier controls all the components of the end-to-end solution.”

In this NPRM, the Board heeds the concerns of industry groups and effectively returns to our original proposal whereby the functional performance criteria in the 508 Standards apply only in two specific circumstances—when there are “gaps” in the technical requirements and when evaluating equivalent facilitation. Specifically, agencies would be required to apply the functional criteria as follows. First, where the proposed requirements in Chapter 4 for hardware and Chapter 5 for software do not address one or more of the features of ICT, sections E204.1 and C202.1 would require the features that are not addressed in those chapters to conform to the functional performance criteria in Chapter 3. This is consistent with the GSA/ITAW’s recommended approach under the existing 508 Standards. It is also consistent with §§ 1193.21 and 1193.41 of the existing 255 Guidelines. Second, section E101.2 proposes to require the functional performance criteria to be used when evaluating ICT for equivalent facilitation. This is consistent with the GSA/ITAW’s recommended approach under the existing 508 Standards.

With respect to the 255 Guidelines, neither the Advisory Committee (in its TEITAC Report) nor the Board (in the 2010 and 2011 ANPRMs) previously proposed any changes to the manner in which telecommunications equipment manufacturers must apply the functional performance criteria. Likewise, the Board proposes no changes in this NPRM. See Section VI.D (Section-by-Section Analysis – Functional Performance Criteria and Technical Requirements - C201.3 and C202).

2. Updates to Functional Performance Criteria: 508 Standards and 255 Guidelines

As noted above, the Board is also proposing in this NPRM to update several functional performance criteria in Chapter 3 (located in Appendix C – Technical Requirements)—which applies to both the 508 Standards and the 255 Guidelines—by refining some criteria and making editorial changes necessitated by revisions elsewhere in the proposed rule. We highlight below several of the principle revisions to the functional performance criteria proposed in this NPRM. In addition, Table 3, which follows at the end of this section, provides a detailed comparison of the functional performance criteria in the existing 508 Standards (§ 1194.31), 255 Guidelines (1193.41), and the proposed rule (section 302).

First, while the functional performance criteria in proposed 302 no longer reference assistive technology, this amounts to an editorial change only. The existing 508 Standards and 255 Guidelines allow certain functional performance criteria to be satisfied either directly or indirectly through support for assistive technology. (See, e.g., existing 508 Standards §§ 1194.31(a) – (e)). The functional performance criteria in the proposed rule do not provide for compliance through support for assistive technology because other proposed revisions to the 508 Standards (E203.1) and 255 Guidelines (C201.3) would impose a general requirement that agencies and telecommunications

equipment manufacturers respectively ensure that all functionality of ICT is accessible to and usable by individuals with disabilities, either directly or by supporting the use of assistive technology.

Second, as discussed in Section IV.E.6, the Board proposes to revise the criteria for users with limited vision in section 302.2. The existing 508 Standards require at least one mode of operation and information retrieval that does not require visual acuity greater than 20/70 to be provided in audio and enlarged print output working together or independently. The existing 255 Guidelines are similar, except that they define users with limited vision as users possessing visual acuity that ranges between 20/70 and 20/200. The proposed rule would require at least one mode of operation that magnifies, one mode that reduces the field of vision required, and one mode that allows user control of contrast where a visual mode of operation is provided. The proposed rule does not refer to visual acuity since comments in response to proposals in the 2010 and 2011 ANPRMs recommended that the criteria should address features that would improve accessibility for users with limited vision instead of using visual acuity as a measure of limited vision.

Third, there are two functional performance provisions in the existing 255 Guidelines that are not found in the functional performance criteria for existing 508 Standards: operations without time-dependent controls (255 Guidelines § 1193.41(g)) and operations with limited cognitive skills (255 Guidelines § 1193.41(i)). There is a technical provision in the existing 508 Standards that corresponds to 255 Guidelines § 1193.41(g) requiring the operation of ICT without time-dependent controls (508 Standards § 1194.22(p)). This is addressed in the proposed rule in WCAG 2.0 Success Criteria 2.2.1 Timing Adjustable and 2.2.2 Pause, Stop and Hide. We propose to incorporate by reference WCAG 2.0 Success Criteria in proposed E207.2 and C205.2.

Fourth, the Board proposes not to include a functional performance criteria relating to limited cognitive skills. The existing 255 Guidelines provide a criterion for at least one mode of operation that minimizes cognitive skills required of the user (§ 1193.41(i)), while the existing 508 Standards have no parallel provision. Such a criterion has not been included in the proposed rule on the advice of the Advisory Committee, which recommended deletion of this criteria pending future research. (See Section VI.C (Section-by-Section Analysis - Application and Scoping).

Table 3 below provides a provision-by-provision summary of how the proposed rule would revise the existing functional performance criteria by comparing the criteria in proposed 302 (in the left-hand column of the table) to its counterparts in existing 508 Standards § 1194.31 (in the middle column of the table) and existing 255 Guidelines § 1193.41 (in the right-hand column of the table).

Table 3 - Comparison of the Functional Performance Criteria in the NPRM and Existing 508 Standards and 255 Guidelines

Proposed Sections E207.2 and C205.2 (incorporating WCAG 2.0 by reference) and 302	Existing 508 Standards	Existing 255 Guidelines
302.1 Without Vision. Where a visual mode of operation is provided, ICT shall provide at least one mode of operation that does not require user vision.	§ 1194.31 (a) At least one mode of operation and information retrieval that does not require user vision shall be provided, or support for assistive technology used by people who or blind or visually impaired shall be provided.	§ 1193.41(a) Operable without vision. Provide at least one mode that does not require user vision.
302.2 With Limited Vision. Where a visual mode of operation is provided, ICT shall provide at least one mode of operation that magnifies, one mode that that reduces the field of vision required, and one mode that allows user control of contrast.	§ 1194.31 (b) At least one mode of operation and information retrieval that does not require visual acuity greater than 20/70 shall be provided in audio and enlarged print output working together or independently, or support for assistive technology used by people who or visually impaired shall be provided.	§ 1193.41 (b) Operable with low vision and limited or no hearing. Provide at least one mode that permits operation by users with visual acuity between 20/70 and 20/200, without relying on audio output.
302.3 Without Perception of Color. Where a visual mode of operation is provided, ICT shall provide at least one mode of operation that does not require user perception of color.	No criteria for users without perception of color.	§ 1193.41 (c) Operable with little or no color perception. Provide at least one mode that does not require user color perception.
302.4 Without Hearing. Where an auditory mode of operation is provided, ICT shall provide at least one mode of operation that does not require user hearing.	§ 1194.31 (c) At least one mode of operation and information retrieval that does not require user hearing shall be provided, or support for assistive technology used by people who are deaf or hard of hearing shall be provided.	§ 1193.41 (d) Operable without hearing. Provide at least one mode that does not require user auditory perception.

Proposed Sections E207.2 and C205.2 (incorporating WCAG 2.0 by reference) and 302	Existing 508 Standards	Existing 255 Guidelines
302.5 With Limited Hearing. Where an auditory mode of operation is provided, ICT shall provide at least one mode of operation that improves clarity, one mode that reduces background noise, and one mode that allows user control of volume.	§ 1194.31 (d) Where audio information is important for the use of a product, at least one mode of operation and information retrieval shall be provided in an enhanced auditory fashion, or support for assistive hearing devices shall be provided.	Operable with low vision and limited or no hearing. Provide at least one mode that permits operation by users with visual acuity between 20/70 and 20/200, without relying on audio output.
302.6 Without Speech. Where a spoken mode of operation is provided, ICT shall provide at least one mode of operation that does not require user speech.	§ 1194.31 (e) At least one mode of operation and information retrieval that does not require user speech shall be provided, or support for assistive technology used by people with disabilities shall be provided.	§ 1193.41(h) Operable without speech. Provide at least one mode that does not require user speech.
302.7 With Limited Manipulation. Where a manual mode of operation is provided, ICT shall provide at least one mode of operation that does not require fine motor control or operation of more than one control at the same time.	§ 1194.31 (f) At least one mode of operation and information retrieval that does not require fine motor control or simultaneous actions and that is operable with limited reach and strength shall be provided.	§ 1193.41 (e) Operable with limited manual dexterity. Provide at least one mode that does not require user fine motor control or simultaneous actions.
302.8 With Limited Reach or Strength. Where a manual mode of operation is provided, ICT shall provide at least one mode of operation that is operable with limited reach and limited strength.		§ 1193.41 (f) Operable with limited reach and strength. Provide at least one mode that is operable with user limited reach and strength.

Proposed Sections E207.2 and C205.2 (incorporating WCAG 2.0 by reference) and 302	Existing 508 Standards	Existing 255 Guidelines
<p>WCAG 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)</p> <ul style="list-style-type: none"> • 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. 	<p>§ 1194.22 (p) When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.</p>	<p>§ 1193.41 (g) Operable without time-dependent controls. Provide at least one mode that does not require a response time. Alternatively, a response time may be required if it can be by-passed or adjusted by the user over a wide range.</p>

Proposed Sections E207.2 and C205.2 (incorporating WCAG 2.0 by reference) and 302	Existing 508 Standards	Existing 255 Guidelines
<p>WCAG 2.2.2 Pause, Stop, Hide: For moving, blinking, scrolling, or auto-updating information, all of the following are true: (Level A)</p> <ul style="list-style-type: none"> • 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. 	<p>§ 1194.22 (h) When animation is displayed, the information shall be displayable in at least one non-animated presentation mode at the option of the user.</p>	<p>§ 1193.43 (c) Access to moving text. Provide moving text in at least one static presentation mode at the option of the user.</p>
<p>No corresponding provisions.</p>	<p>No corresponding provisions.</p>	<p>§ 1193.41 (i) Operable with limited cognitive skills. Provide at least one mode that minimizes the cognitive, memory, language, and learning skills required of the user.</p>

D. Real-Time Text

In this NPRM, the Board proposes to require that ICT support RTT functionality whenever such ICT also provides real-time, two-way voice communication. This proposal represents a significant shift in approach for both the 508 Standards and the 255 Guidelines to better align with current technology. The existing 508 Standards and 255 Guidelines were published over a decade ago. At the time, TTYs were the most commonly available text-based system for communicating within a voice communication system. Since then, technology has greatly advanced. There are now, in addition to TTYs, multiple text-based means of communication available in the marketplace. This proposed revision will update the standards to reflect changes in telecommunications technology.

Section 410.6 of the proposed rule would require ICT with real-time voice communication features to also support communication through real-time text. Such ICT would be required to support RTT either within its own closed system or outside a network. For example, a closed communication system, such as within a federal agency, would be required to interoperate with either the publicly switched telephone network (PSTN) or Voice over Internet Protocol (VoIP) products or systems to support the transmission of real-time text. When ICT interoperates with VoIP products or systems using Session Initiation Protocol (SIP), the Board proposes to require the transmission of real-time text to conform to the Internet Engineering Task Force's RFC 4103 standard for RTP Payload for Text Conversation. Where ICT interoperates with the PSTN, real-time text would be required to conform to the Telecommunications Industry Association's TIA 825-A standard for TTY signals at the PSTN interface (also known as Baudot). RFC 4103 and TIA 825-A are final standards proposed for incorporation by reference in 508 Chapter 1 and 255 Chapter 1 (see sections E102 and C102, respectively).

Commenters to the 2011 ANPRM noted that other standards aside from RFC 4103—such as XMPP and XEP-0301—were currently in use and could be referenced as specifications for ICT interoperability with VoIP using SIP. XEP-0301 is one of several pending standards developed for use in the Extensible Messaging and Presence Protocol (XMPP). XMPP is a set of open technologies for instant messaging, multi-party chat, voice and video calls, collaboration, and generalized routing of XML data. XMPP was originally developed in the Jabber open-source community to provide an open, secure, spam-free, decentralized alternative to closed instant messaging services. XMPP differs from SIP, which is an application layer protocol used to establish, modify, and terminate multimedia sessions such as VoIP calls. Currently, both the XMPP and the SIP protocol are used in the marketplace. At this time, however, only the standard supporting the transmission of RTT over SIP (RFC 4103) is final. The standard supporting RTT over XMPP (XEP-0301) is not yet finalized.

XEP-0301, In-Band Real-time Text, is a specification for real-time text transmitted in-band over an XMPP network. It is used for text messaging. As of the date of this publication, according to the XMPP Standards Foundation, the XEP-0301 standard is under review and not yet final. XEP-0301 has many advantages: it allows transmission

of real-time text with minimal delays; it supports message editing in real-time; and, it has reliable real-time text delivery. It can be used for multiple users and allows alternate optional presentations of real-time text, including split screen or other layouts. The standard also allows use within gateways to interoperate with other real-time text protocols, including RFC 4103. It allows immediate conversational text through mobile phone text messaging and mainstream instant messaging. For more information on the benefits of XEP-0301, see <http://www.realjabber.org/xep/xep-0301.html>.

Yet despite its potential benefits, the Board cannot incorporate XEP-0301 until it becomes a final standard. However, should the XEP-0301 standard be finalized before publication of the final rule, the Board plans to incorporate it by reference as an alternative technology to support transmission of RTT when interoperating with VoIP products or systems using XMPP. RFC 4103 would, in any event, be retained for ICT interoperating with VoIP products or systems using SIP technology.

Question 8. If the XEP-0301 standard is finalized, the Board is considering incorporating it by reference as an alternative standard for XMPP networks. We seek comment on the benefits, costs, and possible drawbacks associated with referencing this standard in addition to the RFC 4103 standard.

The European standard, EN 301 549 would allow the use of multiple standards for RTT. As discussed in 4.6, Harmonization with European Activities above, EN 301 549 lists several standards for RTT, as well as an unspecified “common specification” for RTT. The common specification must indicate a method for indicating loss of corruption of characters. The Board seeks comment on whether other standards should be incorporated by reference. The other standards are:

- ITU-T v.18, Recommendation ITU-T V.18 (2000) “Operational and interworking requirements for DCEs operating in the text telephone mode” (see EN 301 549 6.3.3(a)). This Recommendation specifies features to be incorporated in data carrier equipment intended for use in, or communicating with, text telephones primarily used by people who are deaf or hard of hearing.
- IP Multimedia Sub-System (IMS) protocols specified in TS 126 114, TS 122 173, and TS 134 229 (see EN 301 549 6.3.3(c)). ETSI TS 126 114, Universal Mobile Telecommunications System (which was referenced in the EAAC Report and Recommendation noted previously in Section IV.F.2) supports a “total communication” approach by establishing a minimum set of codecs and transport protocols that must be supported by all elements in the IMS system for video, real-time text, audio, and high definition (HD) audio. As noted previously, the Board decided not to require standards for video, audio, or HD audio in this proposed rule beyond the technical requirements set forth in proposed 410 (ICT with Two-Way Voice Communication). Both the ETSI TS 122 173 and ETSI TS 134 229 standards are still under development, and, therefore, cannot be referenced at this time.

Question 9. Are there sufficient net benefits to be derived from requiring ITU-T v.18 that the Board should reference it in addition to TIA 825-A (2003)? We are requesting that telecommunication equipment manufacturers, in particular, provide any data regarding potential costs related to complying with this standard. Are there suggestions for other standards which would result in the same level of accessibility?

Question 10. Are there net benefits to be derived from requiring more standards addressing multimedia than what we propose? The Board is requesting that telecommunication equipment manufacturers, in particular, provide any data regarding potential costs related to complying with the standards in EN 301 549 6.3.3(c). Are there suggestions for other standards which would result in the same level of accessibility?

Question 11. Is ETSI TS 122 173 or ETSI TS 134 229 sufficiently significant that the Board should consider referencing either standard when it becomes final?

E. Assistive Technology

Based on the work of the Advisory Committee and feedback from commenters, the Board proposes in this NPRM to directly cover some, but not all, aspects of assistive technology (AT). All stakeholders agreed that improving ICT-AT interoperability was critically important, but offered differing perspectives on how to make this happen. There was general consensus on some proposals (e.g., requirements for mainstream ICT), but not for others (e.g., requirements for, and status of, AT). In this NPRM, the Board proposes to revise its existing 508 Standards and 255 Guidelines by: (a) updating the existing requirements for mainstream ICT software products—namely, platforms, operating systems, and applications—to interoperate with assistive technology based on consensus standards; (b) adding a new requirement for AT with a user interface to interoperate with mainstream platforms and industry standard accessibility services; and (c) clarifying that assistive technology is generally exempted from compliance with otherwise applicable technical requirements for hardware (Chapter 4) and software (Chapter 5). Each of these areas are discussed briefly below.

With respect to the ICT side of the ICT-AT interoperability equation, the Board proposes a set of updated technical requirements for platforms and applications that will result in improved interoperation. This proposal received strong support from industry stakeholders who lauded it as an important improvement from the existing requirements because it was comprehensive, testable, and harmonized with international consensus standards for software accessibility. Proposed 502 contains three main subsections. Proposed 502.2 Documented Accessibility Features largely tracks § 1194.21(b) of the existing 508 Standards, and was strongly recommended by the Advisory Committee. Proposed 502.3 (Platform) Accessibility Services incorporates much of existing 508 Standards §§ 1194.21(b), (c), (d), and (f), but proposed 502.3.1 through 502.3.9 provide significantly greater detail. Lastly, in 502.4 Platform Accessibility Features, the Board proposes to require that platforms provide specific accessibility features common to most platforms. This provision is being proposed in response to concerns raised by consumers and the assistive technology industry that the Board was not being

sufficiently proactive in spelling out the accessibility features that are well-established best practices. This proposal is based on requirements in the ANSI/HFES 200.2 Human Factors Engineering of Software User Interfaces standard, and represents current industry practice.

Second, to address the role of the AT in ICT-AT interoperability, the Board proposes modest requirements for assistive technology. Proposed 503.3 Alternate User Interfaces would require assistive technology to use the basic set of platform accessibility information provided by operating systems and software (i.e., platform accessibility information provided under proposed 502.2) to aid interoperability, and, thereby, decrease the need for customized approaches. In other words, software providing an alternative user interface would need to support the platform for which it is designed. Commenters outside the AT industry voiced strong support for this proposal; these views convinced the Board that this modest shift in approach from the existing requirements would better ensure ICT-AT interoperability. Because it is sometimes ambiguous whether a software product is serving as assistive technology, this proposed provision speaks in terms of “alternate user interface[s] that function[] as assistive technology.” Proposed 503.3 is the only manner in which the Board is proposing to directly impose requirements on assistive technology; in all other respects, provisions aiding interoperability are directed at platforms, operating systems, and other types of applications.

Third, to provide clarification sought by a number of commenters, the Board proposes to expressly exempt assistive technology from compliance with technical requirements generally applicable to hardware (Chapter 4) and software (Chapter 5). Commenters had expressed concern that, if assistive technology was treated as ICT for all purposes, some assistive technology would not be able to fulfill its intended function. For example, an individual with low muscle tone may find that a specialized, flat membrane keyboard best serves his or her needs; however, such a keyboard would not satisfy the requirements of Chapter 4 because, among other things, it does not have tactilely discernable separation between keys (proposed 407.3). Accordingly, proposed 401.1 provides an exception for hardware that is assistive technology, and a similar exception is proposed for assistive technology software (501.1 – Exception 2).

VI. Section-by-Section Analysis

A. Introduction

As noted above, the Board is proposing to revise and update both the 508 Standards and 255 Guidelines. The existing standards and guidelines are set forth in two separate regulatory parts—36 CFR Parts 1194 and 1193—and apply to different types of covered entities (e.g., federal entities and telecommunications equipment manufacturers). Nonetheless, these two sets of provisions contain many similar provisions and are, in our view, inextricably linked from a regulatory perspective. Both the 508 Standards and 255 Guidelines contain technical requirements for the design of accessible ICT. Both contain functional performance criteria, which apply when there are gaps in one or more of their respective technical provisions. Both address hardware and software features of ICT. Finally, both require that support documentation and services, when offered, are provided in a manner that meets the communication needs of individuals with disabilities and conveys information on the accessibility features of ICT.

We are proposing to combine the 508 Standards and 255 Guidelines into a single comprehensive set of requirements with three parts that will appear as Appendices A, B, and C to 36 CFR Part 1194. Appendix A covers the proposed application and scoping requirements for ICT subject to Section 508 (“508 Chapter 1” and “508 Chapter 2”). Appendix B addresses the proposed application and scoping requirements for ICT covered by Section 255 (“255 Chapter 1” and “255 Chapter 2”). Appendix C includes the proposed functional performance criteria (Chapter 3) and the proposed technical requirements (Chapters 4 through 6) that are referenced by the Section 508 and Section 255 scoping provisions in Appendices A and B.⁶

Application and scoping includes instructions on when and how the provisions in proposed chapters 3 through 6 would apply under Sections 508 and 255. With this proposed format, it is critical for covered entities to review scoping and application in either Appendix A (508 Chapters 1 and 2) or Appendix B (255 Chapters 1 and 2) before consulting the functional performance and technical criteria in Appendix C (Chapters 3, 4, 5 and 6). For example, under Section 508, federal agencies that wish to procure, use, maintain or develop ICT, must first understand what ICT is covered by the proposed technical requirements and functional performance criteria. This information exists only in Appendix A. Agencies would not consult Appendix B because it applies only to telecommunications equipment manufacturers subject to Section 255. Similarly, telecommunications equipment manufacturers would consult Appendix B to ascertain what ICT is subject to the proposed technical requirements and functional performance criteria under Section 255; they would not be required to comply with Appendix A. Nonetheless, it bears noting that, while a Section 255-covered manufacturer is not

⁶ Advisory sections and figures that illustrate the technical requirements are available on the Internet at: www.access-board.gov. The advisory sections provide guidance only and do not contain mandatory requirements.

obligated to comply with the 508 Standards, such manufacturers may still elect at their discretion to consult the standards if they wish. For example, if a telecommunications equipment manufacturer wished to make certain products (or features of products) more marketable to federal agencies, this manufacturer might choose to consult the 508 Standards to be familiar with standards governing federal agencies' procurement obligations.

Naming conventions used in the Appendices for requirements also help indicate whether a particular provision applies under Section 508, Section 255, or both. In Appendix A, all proposed provisions are preceded by the letter "E" to indicate the provision would be applicable under Section 508 only. In Appendix B, all proposed provisions are preceded by the letter "C" to indicate the provision would be applicable under Section 255 only.⁷ The proposed technical requirements in Appendix C do not include an alphabetic prefix because, as discussed above, they would be applied in accordance with the application and scoping requirements in either Appendix A or Appendix B, depending on whether the covered entity is subject to Section 508 (federal entities) or Section 255 (telecommunications equipment manufacturers).

This proposed formatting and organizational structure is based on recommendations made by the Advisory Committee and public comments submitted in response to the 2010 and 2011 ANPRMs. Section VI.B (508 Standards: Application and Scoping) and Section VI.C (255 Guidelines: Application and Scoping), below, summarize the proposed rule and explain any differences between the existing requirements for Section 508 and Section 255 and the proposed rule. Due to the overlapping nature of the proposed 508 Standards and 255 Guidelines, some of the following section-by-section discussions of particular standards also address a "sister" guideline. In addition, in a number of these sections, the Board poses questions soliciting comments, information, or data from the public.

B. 508 Standards: Application and Scoping

508 Chapter 1: Application and Administration

This chapter proposes general requirements reflecting the purpose of the 508 Standards (E101.1). It also proposes criteria for equivalent facilitation (E101.2), lists referenced standards and where they may be obtained (E102), and provides definitions of terms used in the standards (E103). 508 Chapter 1 proposes, in large part, to simplify and reorganize similar provisions contained in existing 508 Standards §§ 1194.1 Purpose, 1194.4 Definitions, and 1194.5 Equivalent Facilitation.

⁷ The "C" prefix for Section 255-specific requirements is a shorthand reference to "communications" in ICT, while the "E" prefix for requirements exclusive to the 508 Standards derives from "electronic" in the former regulatory term, E&IT.

E101 General

This is an introductory section.

E101.1 Purpose

This section states that the purpose of the 508 Standards is to provide scoping and technical requirements for ICT that is accessible to and usable by individuals with disabilities. Compliance with these requirements is mandatory for federal agencies subject to Section 508.

E101.2 Equivalent Facilitation

This section is based on existing 508 Standards § 1194.5. It would permit the use of an alternative design or technology in lieu of conformance to the proposed technical requirements in Chapters 4 and 5, but only if the alternative design or technology provides substantially equivalent or greater accessibility and usability by persons with disabilities than would be provided by conforming to the proposed technical provisions. This section also would require the proposed functional performance criteria in Chapter 3 to be used to determine whether the alternative design or technology provides individuals with disabilities with substantially equivalent or greater accessibility and usability. The application of the functional performance criteria for this purpose would fill in a gap in the existing 508 Standards, which do not explain how the functional performance criteria are to be used in relation to the technical provisions. We explain our approach in greater detail above in Section V.C (Major Issues – Functional Performance Criteria).

E101.3 Conventional Industry Tolerances

This section would provide that dimensions are subject to conventional industry tolerances except where dimensions are stated as a range. This proposed provision would be new to the 508 Standards and would clarify how dimensions are to be interpreted when specified in the text or a referenced standard.

E101.4 Units of Measurement

This section would note measurements are stated in U.S. customary and metric units and that the values stated in each system (U.S. customary and metric units) may not be exact equivalents. This section would also provide that each system be used independently of the other. This proposed section is new to the 508 Standards and would clarify dimensions stated in the text of the proposed rule.

E102 Referenced Standards

This is an introductory section.

E102.1 Incorporation by Reference

This section lists the technical standards developed by voluntary consensus standard-setting bodies that the Board proposes to incorporate by reference in the proposed 508 Standards. It would require that where there is a difference between a provision of the proposed 508 Standards and the referenced standards, the 508 Standards would apply.

Incorporating these standards complies with the federal mandate—as set forth in the National Technology Transfer and Advancement Act of 1995 and OMB Circular A119—that agencies use voluntary consensus standards in their regulatory activities unless doing so would be legally impermissible or impractical. The standards proposed for incorporation would improve clarity because they are built on consensus standards developed by stakeholders. Most of these standards are widely used and, therefore, should be familiar to many regulated entities.

Incorporation by reference of these standards would be a distinct change and improvement from the existing 508 Standards, which contain no referenced standards. The Advisory Committee strongly recommended the adoption of specific accessibility consensus standards in order to promote harmonization. The adoption of consensus standards results in a more unified regulatory environment in which all participants benefit from clarity and simplicity. As noted in the TEITAC Report:

Industry supports harmonization in principle because it allows the ICT market to address accessibility through a global process -- one product developed to be sold world-wide -- rather than by trying to meet unique, potentially conflicting standards required by different countries. Harmonization should result in more accessible products, delivered through a more economically efficient market. Consumers thus benefit directly from harmonization; they also benefit indirectly because harmonization allows advocates to focus their efforts on fewer standards development activities. It is this economy of focused effort that may offer the greatest net benefit to people with disabilities. (TEITAC Report, Part 4, section 4.3).

Once incorporated by reference, the referenced standards become part of the 508 Standards. We are unaware of any duplication or overlap among the parts of the proposed standards, including the standards incorporated by reference. However, in order to address any potential conflicts, proposed E102.1 (as well as C102.1) provide that, when a conflict occurs between the 508 Standards (or 255 Guidelines) and a standard incorporated by reference, the 508 Standards (or 255 Guidelines) apply.

While a discussion of the estimated economic impact of the proposed rule—including the proposed incorporation by reference of the consensus technical standards listed in E102.1 and C102.1—follows below in Section VIII, two points bear noting here. First, the cost of implementing this proposed rule can be mitigated, in part, through use of an updated product accessibility template that includes WCAG 2.0 and the other referenced standards. The product accessibility template, available through the GSA

Section508.gov site is intended to help agencies understand which provisions apply to particular products. We expect GSA will update this tool so that it will be available for use by agencies on or before the effective date of revised 508 Standards. Second, the W3C WCAG website provides readily available technical assistance—free of charge—that is linked to each technical requirement in WCAG 2.0. A great deal of third-party information is also available. Collectively, these resources should also greatly aid federal agencies and other regulated entities become conversant with the provisions in this standard, to the extent they are not already familiar with them.

The Office of the Federal Register recently promulgated a final rule requiring federal agencies to provide information to the public in regulatory preambles relating to the availability of materials to be incorporated by reference. In Section VII.G (Regulatory Process Matters – Availability of Materials Incorporated by Reference) below, the Board provides information on the availability of ten consensus standards proposed for incorporation by reference in the 508 Standards and 255 Guidelines.

The proposed 508 Standards would incorporate by reference the following standards:

E102.2 ANSI/HFES

ANSI/HFES 200.2, Human Factors Engineering of Software User Interfaces — Part 2: Accessibility (2008), would be incorporated by reference at 502.4. This standard provides ergonomic guidance and specifications for the design of accessible software for use at work, in the home, in educational settings, and in public places. It covers issues associated with designing accessible software for people with a wide range of physical, sensory and cognitive abilities, including those who are temporarily disabled and the elderly.

This proposed standard would be new to both the 508 Standards and 255 Guidelines. Referencing this standard will ensure that ICT operating systems provide accessibility features (e.g., keyboard entry with a single finger, visual alerts paired with audible prompts) that users with disabilities expect and have come to rely upon. These features are commonly available in platform operating systems; the standard, therefore, serves mainly to codify current industry practices.

E102.3 ANSI/IEEE

ANSI/IEEE C63.19-2011, American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids, would be incorporated by reference at 410.4.1. This standard is consistent with current telecommunications industry practices.

Products conforming to this standard minimize interference to hearing aids by wireless telephones. When telephone interference is not minimized, it can create noise in hearing aids that masks the sound of conversation. An added value of this standard is that it provides a uniform method of measurement for compatibility between hearing aids and wireless communications devices.

E102.4 ATSC

A/53 Digital Television Standard, Part 5: AC-3 Audio System Characteristics (2010) would be incorporated by reference at 412.1.1. This standard provides technical requirements for digital television tuners when they process audio description. This standard is consistent with current telecommunications industry practice.

E102.5 IETF

RFC 4103, RTP Payload for Text Conversation (2005), would be incorporated by reference at 410.6.3.2. This standard describes how to carry real-time text conversation session contents in RTP packets. Real-time text conversation is used alone, or in connection with other conversational modalities, to form multimedia conversation services. Examples of other conversational modalities are video and voice. When using RTT, text is received at the same time it is generated. For people who communicate without voice, RTT offers a way to interact that more closely resembles a live two-way call. This proposed standard would be new to the 508 Standards (as well as the 255 Guidelines), and represents a significant shift to better align with current technology. IP-based RTT is the only modern technology that offers the same functionality that TTYs have historically provided. Contemporary TTYs do not work with modern IP desk phones because the acoustic signal (Baudot) is garbled due to incompatible compression algorithms. When communication in real time is important, as in emergency situations, RTT allows users to communicate in a manner similar to a live two-way voice call. Parties exchange information in real time and can interrupt each other during the conversation. This technology most closely approximates the useful features of TTYs. Real-time text is also discussed in detail in Section V.D (Major Issues – Real-Time Text) above.

E102.6 ISO

ISO 14289-1 (2012), Document management applications — Electronic document file format enhancement for accessibility — Part 1: Use of ISO 32000-1 (PDF/UA-1), would be incorporated by reference at E205.1 and 602.3.1. This is an international standard for accessible portable document format (PDF) files. PDF/UA-1 provides a technical, interoperable standard for the authoring, remediation, and validation of PDF content to ensure accessibility for people with disabilities who use assistive technology such as screen readers, screen magnifiers, joysticks and other assistive technologies to navigate and read content. This proposed standard is new to both the 508 Standards and the 255 Guidelines. It is offered as an option to WCAG 2.0 for accessible PDFs.

E102.7 ITU-T

ITU-T Recommendation G.722, General Aspects of Digital Transmission Systems, Terminal Components, 7 kHz Audio-Coding within 64 kbits/s (Sept. 2012), would be incorporated by reference at 410.5. This standard is an ITU-T standard coder-decoder program that provides 7 kHz wideband audio at data rates from 48, 56, and 64 kbits/s.

This standard provides a significant improvement in speech quality over earlier standards. It was previously proposed in the 2011 ANPRM and received no objections.

ITU-T Recommendation E.161: Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network (Feb. 2001), would be incorporated by reference at section 407.3.2. This standard is an ITU-T standard that defines the assignment of the basic 26 Latin letters (A to Z) to the 12-key telephone keypad. It provides guidance for arranging alphabetic keys in a predictable, consistent manner. This proposed standard is new to the 508 Standards (as well as the 255 Guidelines), though it reflects current industry practice.

E102.8 TIA

TIA 825-A (2003), A Frequency Shift Keyed Modem for Use on the Public Switched Telephone Network, would be incorporated by reference at 410.6.3.1. This is the standard for TTY signals on the public switched telephone network interface (PSTN). This standard is consistent with current industry practice in the telecommunications industry.

TIA 1083 (2007), Telephone Terminal Equipment Handset Magnetic Measurement Procedures and Performance Requirements, would be incorporated by reference at 410.4.2. This standard defines measurement procedures and performance requirements for the handset generated audio band magnetic noise of wire line telephones, including digital cordless telephones. This standard is consistent with current telecommunications industry practice.

E102.9 W3C

Web Content Accessibility Guidelines (WCAG) 2.0, W3C Recommendation, December 11, 2008, would be incorporated by reference in sections E205.1, E207.2, 405.1 Exception, 501.1 Exception 1, 504.2, 504.3, 504.4, and 602.3.1. WCAG 2.0 offers a series of recommendations to make Web content more accessible to all users, including persons with disabilities. We discuss our proposal to incorporate WCAG 2.0 by reference in greater detail above in Section V.B (Major Issues – WCAG 2.0 Incorporation by Reference).

E103 Definitions

This is an introductory section.

E103.1 Terms Defined in Referenced Standards

This section proposes that terms defined in referenced standards, which are not otherwise defined in section E103.4, would have the meaning given them in their respective referenced standards.

E103.2 Undefined Terms

This section proposes that the meaning of terms not defined in section E103.4 or in referenced standards shall be given their ordinarily accepted meanings in the sense that the particular context implies.

E103.3 Interchangeability

This section proposes that words, terms, and phrases used in the singular shall include the plural and those used in the plural shall include the singular.

E103.4 Defined Terms

This section includes definitions for terms used in, or integral to, the proposed 508 Standards. Some of the definitions have been carried over in whole or in part from the existing 508 Standards, while others represent terms that are new to these standards. We also propose to delete several definitions from the existing 508 Standards that are either obsolete or no longer needed. A summary of the proposed definitions in E103.4 follows below. Terms that are not discussed remain unchanged from the existing 508 Standards.

For four terms in the existing 508 Standards, the Board proposes to retain the term, but make slight changes to their respective definitions to improve clarity or to account for technological advances. The definition of the term “agency” would be revised to expressly include agencies and departments of the United States as defined in 44 U.S.C. 3502 and the U.S. Postal Service. The term “assistive technology” would include minor editorial changes from the text in the existing 508 Standards. The term “operable controls” would be revised to “operable part,” which would be defined as “a component of ICT used to activate, deactivate, or adjust the ICT.” The proposed definition would not include the requirement for physical contact found in the definition in the existing 508 Standards and would not include examples of controls. The term “TTY” would be updated to reflect modern technologies currently in use, and would specifically mention such examples as devices for real-time text communications, voice and text intermixed communications (e.g. voice carry over and hearing carry over), and computers with TTY-emulating software and a modem.

Two other terms are new to the proposed 508 Standards, but have close analogs in the existing standards. First, the term “closed functionality” would replace “self-contained closed products.” The proposed new definition would provide a more accurate description of the characteristics of the ICT that is addressed in the proposed provision in section 402 “Closed Functionality.” In addition, this term would address both those features of ICT that are closed by design and other features that are closed because of policies that may restrict specific functions of ICT, where the ICT might normally be capable of being made accessible to an individual with a disability. For example, a policy not allowing the attachment of data storage devices to ICT would, in the case of an individual with low vision, essentially block that person from being able to attach a

device containing magnification software. The new definition would include examples of ICT with closed functionality, such as self-service machines and fax machines.

Second, the term “information and communication technology” (ICT) would replace “electronic and information technology” (E&IT), and revise the definition significantly. The proposed definition for ICT would be broader than the existing definition of E&IT in that it encompasses both electronic and information technology covered by Section 508, and telecommunications products, interconnected Voice over Internet Protocol (VoIP) products, and Customer Premises Equipment (CPE) covered by Section 255. Using a common term that is applicable to both the 508 Standards and 255 Guidelines supports one of the central goals of this rulemaking—namely, development of a single set of comprehensive requirements for two substantive areas that are inseparable from regulatory and policy perspectives. Additionally, to address confusion regarding application of the existing 508 Standards to electronic documents, the proposed ICT definition expressly clarifies that electronic content—such as Web pages and PDFs—falls within the definition of ICT. Lastly, this newly defined term provides an updated set of illustrative examples that better reflect today’s technologies.

We developed the definition for ICT by using the concepts from the existing definitions of “electronic and information technology,” “information technology,” and “telecommunications equipment,” albeit with significantly revised language. Defining a common term that covers both Section 508-covered E&IT and Section 255-covered telecommunications products and services is consistent with the overall approach in the proposed rule of presenting a unitary set of regulatory requirements under these two statutes. The proposed definition of ICT is also consistent with the terminology used by the Advisory Committee in its TEITAC report. That report noted:

Section 255 covers telecommunications products and services. Section 508 covers electronic and information technologies (E&IT). For convenience and clarity, wherever these two categories are taken together, we are using the common term “information and communication technologies, or ICT. (TEITAC Report, Part 1 & fn. 1.)

The TEITAC Report further noted that the 255 Guidelines developed by the Access Board “cover customer premises equipment and telecommunications equipment, but do not address services.” (See TEITAC Report, Part 1 & fn. 2.)

We proposed in the 2010 and 2011 ANPRMs that the term “information and communication technology (ICT)” be used to refer to electronic and information technology covered by Section 508 as well as to telecommunications products, interconnected Voice over Internet Protocol (VoIP) products, and Customer Premises Equipment (CPE) covered by Section 255. Commenters to the 2010 and 2011 ANPRMs supported this approach. In the proposed rule, the Board retains this approach.

The remaining 18 terms defined in proposed E103.4 have no counterparts in the existing 508 Standards. We propose adding these terms to the 508 Standards to

provide definitions for key terms used in the proposed standards, reflect technological advances since promulgation of the existing 508 Standards, and aid stakeholder understanding. These new terms are described below.

The term “508 Standards” is defined in order to provide consistent cross-reference within the standards to all chapters that apply to Section 508-covered federal entities, namely: 508 Chapters 1 and 2 (36 CFR Part 1194, Appendix A), and Chapters 3 through 6 (36 CFR Part 1194, Appendix C). This definition is consistent with proposed § 1194.1, as well as usage of the term throughout this NPRM.

The term “audio description” is used in existing 508 Standards § 1194.24(d) but not defined. We would add a definition derived from WCAG 2.0, which would in part explain that “audio description” is “narration added to the soundtrack to describe important visual details that cannot be understood from the main soundtrack alone.”

The term “authoring tool” would be defined to mean “any software, or collection of software components, that can be used by authors, alone or collaboratively, to create or modify content for use by others, including other authors,” and would be included to explain the proposed provision in section 504, “Authoring Tools.”

The term “content” would be defined as “Electronic information and data, as well as the encoding that defines its structure, presentation, and interactions.” The definition is based on WCAG 2.0, and is proposed to promote harmonization and greater clarity in the proposed Standards and Guidelines.

The term “keyboard” would be defined as “a set of systematically arranged alphanumeric keys or a control that generates alphanumeric input by which a machine or device is operated.” This proposed definition would also clarify that a “keyboard” includes “tactilely discernible keys used in conjunction with the alphanumeric keys if their function maps to keys on the keyboard interfaces.” This proposed new definition would clarify the use of the term “keyboard” in Chapter 4 (Hardware).

The term “Voice over Internet Protocol (VoIP)” is new and is defined consistent with current FCC regulations.

The remaining twelve proposed new terms would be added to aid stakeholder understanding of particular requirements or criteria in the 508 Standards. Definitions for the terms “label,” “name,” “programmatically determinable,” and “text” are taken from WCAG 2.0. Additionally, the terms “application,” “hardware,” and “software” are based on definitions provided in the FCC’s regulations implementing Section 255 of the Communications Act. See 47 CFR Part 14. Definitions for the terms “menu,” “platform accessibility services,” “platform software,” “real-time text,” and “terminal” were drawn from the work of the Advisory Committee and other sources. “Menu,” “platform accessibility services,” and “real-time text” were proposed in the 2010 and 2011 ANPRMs. We received no public comments in response to these definitions in the two ANPRMs.

Lastly, proposed E103.4 would not include several terms that are defined in the existing 508 Standards. These terms are not included in this proposed rule because either the proposed technical requirement associated with the term sufficiently conveys its meaning (i.e., “alternate formats” and “undue burden”), or because the term is not used in the proposed rule (i.e., “alternate methods,” “product,” and “self-contained, closed products”).

508 Chapter 2: Scoping Requirements

This chapter proposes scoping for ICT that is procured, developed, maintained or used by federal agencies—that is, the types of ICT that would be required to conform to the proposed functional performance criteria and technical requirements in the 508 Standards, as well as the conditions under which these provisions would apply. Chapter 2 would contain provisions currently addressed in existing 508 Standards §§ 1194.2 “Application” and 1194.3 “General Exceptions,” thereby locating all scoping provisions in a single chapter.

E201 Application

This is an introductory section.

E201.1 Scope

This section proposes that ICT procured, developed, maintained, or used by agencies must conform to the proposed requirements set forth (or referenced) in 508 Chapter 2. This provision is consistent with existing 508 Standards § 1194.2.

E202 General Exceptions

This section contains proposed exceptions to the general scoping provisions in proposed 201. The structure of the proposed standards reinforces the principle that, under the general scoping provision, all ICT procured, developed, maintained or used by agencies would be required to conform to the proposed requirements, unless otherwise exempted. General exceptions apply broadly and, where applicable, exempt ICT from conformance with the proposed 508 Standards. Most of the proposed general exemptions are the same as those in existing 508 Standards § 1194.3, with only minor editorial changes. A brief discussion of the proposed changes to the General Exceptions follows below.

The Board is proposing to exclude from this rule two exceptions that are contained in the existing 508 Standards: §§ 1194.3(c) and 1194.3(d). Section 1194.3(c) provides that assistive technology need not be provided at the workstations of all federal employees. However, there is no general rule in either the existing or proposed 508 Standards that requires agencies to provide assistive technology at all workstations. Instead, these standards require compatibility with assistive technology when ICT is not directly accessible. The exception in § 1194.3(c) is thus unnecessary and potentially confusing. Consequently, the Board is not retaining it in the proposed rule.

We are also proposing to exclude the exception in § 1194.3(d) of the existing 508 Standards, which provides that when agencies provide the public access to ICT, they are not required to make agency-owned ICT available to individuals with disabilities who are members of the public at non-public locations. We are proposing to remove this exception because there is nothing in the proposed 508 Standards that would require an agency to provide accessible ICT at a specific location, or that would require public access to locations not open to the public. Consequently, this exception is not needed, and its removal from the 508 Standards would have no practical impact. The Board intends to address the continuing obligation of agencies to provide accommodations under Sections 501 and 504 of the Rehabilitation Act in forthcoming guidance material to be posted on our website following publication of the final rule.

E202.1 General

This section proposes that ICT is exempt from these requirements to the extent specified by section E202.

E202.2 National Security Systems

This section proposes that ICT operated by agencies as part of a national security system, as defined by 40 U.S.C. 11103(a), is exempt from the requirements of this document. This is unchanged from existing 508 Standards § 1194.3(a).

E202.3 Federal Contracts

This section proposes that ICT acquired by a contractor that is incidental to a contract would not be required to conform to this document. This proposed exception is unchanged from existing 508 Standards § 1194.3(b), and the Board's approach is discussed in greater detail above in Section IV.E.8 (Rulemaking History – 2010 and 2011 ANPRMs: Significant Issues – Revisions to Exceptions under 508 Standards).

E202.4 Functions Located in Maintenance or Monitoring Spaces

This section proposes to revise § 1194.3(f) of the existing 508 Standards to clarify that, where status indicators and operable parts for ICT functions are located in spaces that are only frequented by service personnel for maintenance, such items need not conform to the requirements of 508 Chapter 2. Functions of ICT located in maintenance spaces that can be controlled remotely, however, would still be required to comply with applicable standards. For example, if a server is located on a tall rack in a maintenance closet accessed only by service personnel, the controls on the server need not be accessible. However, any network or other server functions that could be accessed remotely would be required to comply with the proposed 508 Standards. We discuss our approach with respect to this exception in greater detail above in Section IV.E.8 (Rulemaking History – Major Issues Addressed in the 2010 and 2011 ANPRMs – Revisions to Exceptions under 508 Standards).

E202.5. Undue Burden or Fundamental Alteration

This section proposes to retain the provisions in existing 508 Standards §§ 1194.3(e) and 1194.2(a) (1), but would combine them in a single provision. This section would require that agencies comply with the requirements of the 508 Standards up to the point where conformance would impose an undue burden on the agency or would result in a fundamental alteration in the nature of the ICT. Proposed subsections E202.5.1 and E202.5.2 respectively set forth criteria for undue burden determinations and establish requirements for written documentation of undue burden and fundamental alteration findings.

E202.5.1 Basis for a Determination of Undue Burden

This section proposes to incorporate language from the definition of “undue burden” in the existing 508 Standards § 1194.4 into a separate scoping provision. It would require that, when determining whether conformance to the proposed 508 Standards would impose an undue burden on the agency, the agency must consider the extent to which conformance would impose significant difficulty or expense taking into consideration the agency resources available to the program or component for which the ICT is to be procured, developed, maintained, or used. The proposed organizational restructuring of the undue burden provision represents an editorial revision only that is not intended to have substantive impact.

E202.5.2 Required Documentation

This section proposes to require responsible agency officials to document in writing the basis for determining that compliance with the proposed 508 Standards would either impose an undue burden or result in a fundamental alteration in the nature of the ICT. This proposed documentation requirement is derived from existing 508 Standards § 1194.2(a) (2) applicable to a determination of undue burden in the procurement context. Proposed 202.5.2 would, however, broaden this existing requirement by requiring written determinations in two new settings: (a) when an agency determines that conformance would result in a fundamental alteration in the nature of the ICT; and (b) when an agency determines that conforming to one or more provisions applicable to the development, maintenance, or use of ICT would impose an undue burden. This change is intended to ensure accountability and transparency in agencies’ Section 508 implementation efforts by treating documentation obligations equally as between procurement and non-procurement contexts.

Under Section 508, it is the responsibility of each agency to establish policies and procedures describing how they will comply with the standards, including those for making undue burden and fundamental alteration determinations. The Department of Justice’s 2012 Biennial Report on Section 508 notes that “[n]early forty percent of agency components reported establishing a formal, written policy to document Section 508 exceptions claimed on [ICT] procurements. Many of these agency components

reported that their [ICT] procurements met the Section 508 requirements and that reliance on an exception was unnecessary.”⁸

The Access Board anticipates that the burdens associated with broadening the scope of the documentation requirement will be minimal. First, proposed 202.5.3 deliberately does not prescribe criteria for needed documentation to ensure a deliberative and documented decisional process without being overly prescriptive. In this way, each agency is free to develop documentation policies and practices that best suit its respective needs and resources. Such an approach is consistent with, and respectful of, Section 508’s grant of independent responsibility for Section 508 enforcement to each agency.

Second, the Board expects that invocation of the undue burden and fundamental alteration exceptions will be infrequent, which would also mean an infrequent need for written determinations. For example, in the procurement context, the DOJ 2012 Biennial Report notes that many responding agency components reported having never relied on any exception. Agency components that did make occasional use of available exceptions, assertions of undue burden or fundamental alteration were, in turn, relatively uncommon. Use of these exceptions in procurements was limited to “large” and “very large” agencies; small and mid-size agencies (i.e., agencies with 10,000 employees or less) did not report using these exceptions. For larger agencies, only about 20 percent of agency components reported using the undue burden or fundamental alteration exceptions respectively. Thus, because proposed 202.5.2 broadens only agencies’ respective obligation to document undue burden or fundamental alteration determinations, and does not change the underlying substantive criteria for these exceptions, it is expected that occasions in which agencies must document use of these exceptions will be infrequent in both procurement and non-procurement contexts.

E202.5.3 Alternative Means

This section proposes that, when an agency determines that an undue burden or fundamental alteration exists, it must provide individuals with disabilities access to and use of information and data by an alternative means that meets identified needs. The proposed provision is taken from existing 508 Standards § 1194.2(a)(1) addressing undue burden, but adds the reference to fundamental alteration to clarify that agencies must still provide people with disabilities access to and use of information and data when either of these exceptions applies.

E202.6 Best Meets

This section proposes that, where ICT conforming to one or more provisions of the 508 Standards is not commercially available, the agency must procure the product that best

⁸ Department of Justice, Section 508 Report to the President and Congress: Accessibility of Federal Electronic and Information Technology (Sept. 2012), available at: http://www.ada.gov/508/508_Report.htm.

meets these standards consistent with its business needs. This section would editorially revise existing 508 Standards § 1194.2(b).

Question 12. We are requesting information on how many times a year, on average, federal agencies respectively procure ICT that “best meets” the 508 Standards.

E202.6.1 Required Documentation

This section proposes to require that agencies document in writing the basis for determining that ICT fully conforming to applicable 508 Standards is not commercially available. Documenting the exception for commercial non-availability is not a requirement in the existing 508 Standards, though such documentation is mandated under the current federal acquisition regulations. See 48 CFR 39.203. A number of commenters to the 2010 ANPRM requested this change and supported its inclusion in the 2011 ANPRM. A documentation requirement was proposed in the 2011 ANPRM, and the Board did not receive any negative comments.

Question 13. The Board seeks information from federal agencies on the estimated number of hours, on average, they anticipate needing to prepare each written documentation of commercial unavailability determination under proposed E202.6.1.

E202.6.2 Alternative Means

This section proposes to require agencies to provide individuals with disabilities the information and data that would have been provided by fully conforming ICT when such ICT is commercially unavailable. Proposed E202.6.2 is similar in intent to proposed E202.5.3 (Undue Burden – Alternative Means), and would reinforce the statutory requirement for agencies to ensure that individuals with disabilities have comparable access to information and data.

E203 Access to Functionality

This is an introductory section.

E203.1 General

This section proposes to require agencies to ensure that all functionality of ICT is accessible to and usable by individuals with disabilities, either directly or by supporting the use of assistive technology. While this provision would be new to the 508 Standards, it is consistent with current agency practice. The Board interprets the statutory requirement to provide comparable access to information and data to be consistent with granting access to all functionality of ICT. This proposed requirement was strongly supported by the Advisory Committee, as well as commenters to the 2010 and 2011 ANPRMs.

E203.2 Agency Business Needs

This section proposes that, when agencies procure, develop, maintain or use ICT, they must identify the business needs of individuals with disabilities affecting vision, hearing, color perception, speech, dexterity, strength, or reach, in order to determine how such users will perform the functions supported by such ICT. The provision would also require agencies to assess how the ICT will be installed, configured, and maintained to support users with disabilities. The list of disabilities in this provision parallels the functional performance criteria proposed in Chapter 3.

The Board intends, through this provision, to reinforce the fundamental principle that agencies have an affirmative, continuing obligation under Section 508 to maintain the accessibility of ICT. While this is not a new requirement under Section 508, it is not expressly addressed in the existing 508 Standards. The Board proposes to include this section in response to many concerns raised over the years about the requirements under Section 508 to maintain ICT accessibility over time. Proposed 203.2 would make clear, for example, that agencies have an affirmative duty to ensure that when an accessible operating system is updated, the current or an updated version of screen reading software is compatible with the updated operating system.

E204 Functional Performance Criteria

This is an introductory section.

E204.1 General

This section proposes that, when the technical provisions of Chapter 4 and 5 do not address one or more features of ICT, any unaddressed features must conform to the Functional Performance Criteria specified in Chapter 3. This proposed section is consistent with current agency practice. The Functional Performance Criteria, and the manner in which they are to be used in evaluating equivalent facilitation under proposed E101.2, is discussed in Section IV.E.3 (Rulemaking History – 2010 and 2011 ANPRMs: Significant Issues – Relationship between Functional Performance Criteria and Technical Provisions), and Section V.C (Major Issues - Functional Performance Criteria).

E205 Content

This is an introductory section.

E205.1 General

This section proposes that public-facing content, along with eight specific categories of non-public facing content, must conform to proposed E205. In turn, proposed E205 requires conformance to the Level A and Level AA Success Criteria and Conformance Requirements specified for Web pages in WCAG 2.0 or ISO 14289-1 (PDF/UA-1), both of which are incorporated by reference in 508 Chapter 1 and 255 Chapter 1. An

exception is provided for non-public facing records maintained by the National Archives and Records Administration (NARA) under federal recordkeeping statutes. These proposed requirements and related exception are also discussed in Section IV.E.1 (Rulemaking History –2010 and 2011 ANPRMs: Significant Issues – Evolving Approaches to Covered Electronic Content), and Section V.A (Major Issues – Electronic Content).

Some file formats, it should be noted, do not directly support accessibility. For example, the JPEG compression standard for digital images does not facilitate embedded text description (commonly referred to as “alt tags”), and the MPEG-4 compression standard for audio and video digital data does not support closed captioning. Conformance may nonetheless be achieved through a variety of techniques, including providing requisite accessibility through the manner in which the inaccessible file is delivered or publicly posted. For example, JPEG photos posted to a website can be associated with descriptive identification using HTML. Photos attached to an email could have the text alternative provided in the body of the email. Similarly, there are commonly available methods for displaying caption text so that it is synchronized with MPEG-4 multimedia.

E205.2 Public Facing

This section proposes that all public-facing content must meet the accessibility requirements in E205.4, which, in turn, requires conformance to WCAG 2.0 Level A and Level AA Success Criteria and Conformance Requirements specified for Web pages or, where applicable, ISO 14289-1 (PDF/UA-1). Public-facing content subject to this provision would include, for example: agency websites; electronic documents, images or video posted on agency websites; and agency social media sites or postings. Content regardless of form or format—including draft electronic documents—would be covered under this proposed section when public facing. Central to the analysis of whether an electronic document should be considered public facing is the identity of the party making the electronic content available to the public. If a federal agency posts an electronic document on its own website, third-party social media site, or other electronic public forum, that document—whether authored by the agency or a third party—is public facing and must comply with E205.2. Coverage of this broad category of agency-sponsored content is important because the Rehabilitation Act mandates that persons with disabilities—both those employed by the federal government and members of the public—have comparable access to, and use of, electronic information and data relative to persons without disabilities.

Question 14. Is the scope of public facing content covered by proposed E205.2 sufficiently clear? Are there other issues the Board should consider in defining the scope of the term “public facing”?

E205.3 Agency Official Communication

This section proposes that an agency’s non-public facing content be required to meet the accessibility requirements in E205.4 (i.e., WCAG 2.0 Level A and Level AA Success Criteria or PDF/UA-1) when such content (a) constitutes agency official business, and

(b) falls within one or more of eight categories of communication. The eight proposed categories are: (1) emergency notifications; (2) initial or final decisions adjudicating administrative claims or proceedings; (3) internal or external program or policy announcements; (4) notices of benefits, program eligibility, employment opportunities or personnel actions; (5) formal acknowledgements or receipts; (6) questionnaires or surveys; (7) templates or forms; and (8) educational or training materials.

While there is no express exception for draft content in E205.3, the Board expects that drafts, by their very nature, would typically fall outside the scope of agency official communications covered by this section. Generally speaking, only final documents and other electronic materials that are ready for dissemination to their intended audience would qualify as the type of content covered by categories 1 through 8. Draft content would, however, fall within the ambit of proposed E205.3 (and, therefore, be required to conform to WCAG 2.0 or PDF/UA-1) when an agency intends a draft to be “final” in the sense that it is being formally disseminated or published for input or comment by its intended audience. For example, if any agency task force is seeking to improve agency-wide telecommuting policies and circulates a draft policy memorandum by email to the office of human resources for review, neither the email nor draft memorandum would be covered under proposed E205.3. However, if instead, the agency task force had completed its draft policy on telecommuting and circulated the draft policy as an email attachment sent to all agency employees soliciting their input and comments, then both the email and attached draft policy memorandum—regardless of format (e.g., word processing document, PDF)—would be covered by this section and, accordingly, need to satisfy the accessibility requirements in E205.4.

Proposed E205.3 also provides an exception for non-public facing content maintained by NARA for archival purposes even if such content otherwise falls into one of the foregoing eight categories. Such electronic records would not need to conform to the accessibility requirements in proposed E205.4 so long as they remained non-public facing. The Board intends the scope of this exception to be limited, and anticipates that it will extend only to non-public facing electronic materials administered or maintained by NARA in compliance with federal recordkeeping statutes and implementing regulations.

E206 Hardware

This is an introductory section.

E206.1 General

This section proposes that components of ICT that are hardware, and transmit information or have a user interface, must conform to the applicable provisions of Chapter 4.

One hardware provision in the existing 508 Standards that has not been retained in the proposed rule is § 1194.23(a). This section has two parts. First, it requires telecommunications products that provide voice communication to provide a standard

non-acoustic connection for a TTY unless the product includes a TTY. Second, it requires microphones to be capable of being turned on and off to allow a user to intermix speech with TTY use. Newer technologies for texting have made the requirement for a standard non-acoustic connection for a TTY obsolete. To address the use of TTYs by individuals also using speech or hearing, the Board is proposing to add section 410.6.5 (HCO and VCO Support). Proposed 410.6.5 would support real-time text functionality and address the capacity for users to intermix speech with text. See Section VI.D. (Section-by-Section Analysis – Technical Requirements – 410.6). Comments received in response to the 2011 ANPRM did not object to these proposed changes.

E207 Software

This is an introductory section.

E207.1 Software

This section proposes that components of ICT that transmit information or have a user interface—such as are firmware, platforms, or software applications—must conform to the applicable provisions in Chapter 5.

E207.2 WCAG Conformance

This section would require that user interface components, along with the content of platforms and applications, conform to Level A and AA Success Criteria and Conformance Requirements specified for Web pages in WCAG 2.0. For a more complete discussion of WCAG conformance requirements in the proposed rule, see the discussion in Section IV.E.2 (Rulemaking History – 2010 and 2011 ANPRMs: Significant Issues – Treatment of WCAG 2.0), and Section V.B (Major Issues – WCAG 2.0 Incorporation by Reference).

E208 Support Documentation and Services

This is an introductory section.

E208.1 General

This section proposes to require agencies, when providing support services or documentation for ICT, to do so in conformance to the provisions of Chapter 6.

C. 255 Guidelines: Application and Scoping

These two proposed chapters contain information on the application and administration of the 255 Guidelines. As discussed above, whereas the 508 Standards relate to the accessibility and usability of electronic and information technology, the 255 Guidelines

relate to the accessibility and usability of telecommunications equipment and customer premises equipment, as defined by the Communications Act.

Because the technologies covered by the 508 Standards and 255 Guidelines often have similar features and functional and technical aspects, the standards and guidelines share common requirements. For ease of reference, the Board discusses here only those requirements in the 255 Guidelines that differ from those in the 508 Standards. Requirements not discussed in the section below (or mentioned only in brief detail) should be deemed to be the same for both the 255 Guidelines and 508 Standards.

Of note, there are two provisions in the existing 255 Guidelines which the Board proposes to not include in the proposed rule: §§ 1193.41(i) and 1193.51(d). Section 1193.41(i) requires input controls on telecommunications equipment to provide at least one mode of operation that minimizes the cognitive skills needed by the user. The Advisory Committee was unable to reach consensus on recommendations for requirements to make ICT accessible for individuals with cognitive disabilities, citing a lack of common standards or testable metrics to verify conformance. Consequently, the Advisory Committee recommended deletion of the existing requirement pending future research.

In the 2010 ANPRM, the Board followed this recommendation and proposed removal of the existing functional performance criterion specifically directed to cognitive disabilities. The Board did, however, seek public input on whether other proposed functional performance criteria adequately addressed cognitive impairments, and solicited input on how updated ICT rules might best address such impairments. Commenters responded with a variety of views. Some commenters believed that cognitive disabilities were already sufficiently addressed through other criteria and requirements, while others preferred inclusion of a functional performance criterion for cognitive disabilities but offered no substantive proposals. Still other commenters—particularly those representing the IT community—thought more research was needed before meaningful requirements could be crafted. Given the variety of commenters' views and the inherent difficulty in creating a single functional performance criterion that adequately covers the wide spectrum of cognitive and intellectual disabilities, the Board elected not to reinstate this functional performance criterion in either the 2011 ANPRM or this NPRM.

We also propose to exclude existing § 1193.51(d) of the 255 Guidelines relating to TTY connectability from the proposed rule for the reasons outlined above in the discussion regarding proposed E206.1 (which, in turn, addresses proposed deletion of a “sister” existing provision in the 508 Standards). See Section VI.B. (Section-by-Section Analysis – 508 Standards: Application and Scoping – E206.1).

255 Chapter 1: Application and Administration

This chapter proposes general requirements reflecting the purpose of the 255 Guidelines (C101.1). It lists referenced standards and where they may be obtained (C102), and provides definitions of terms used in the proposed 255 Guidelines (C103).

255 Chapter 1 proposes to simplify and reorganize similar provisions contained in existing §§ 1193.1 “Purpose” and 1193.3 “Definitions” of the 255 Guidelines.

C101 General

This is an introductory section.

C101.1 Purpose

In keeping with the Board’s statutory charge under the Communications Act, this section states that the purpose of the proposed 255 Guidelines is the provision of scoping and technical requirements for telecommunications equipment and customer premises equipment to ensure that such equipment is accessible to and usable by individuals with disabilities. This section also emphasizes, moreover, that the proposed guidelines are to be applied to the extent required by regulations issued by the Federal Communications Commission under the Telecommunications Act of 1996 (47 U.S.C. 255). As noted previously, the FCC has exclusive authority to enforce Section 255 and issue implementing regulations; the FCC may—but is not required to—adopt the proposed guidelines when finalized as enforceable accessibility standards for manufacturers of telecommunications equipment and customer premises equipment.

C101.2 Equivalent Facilitation

This proposed section addresses when telecommunications equipment manufacturers may use equivalent facilitation, and mirrors a corresponding provision in the proposed 508 Standards (E101.2). While the existing 255 Guidelines do not expressly address equivalent facilitation, the concept of allowing alternative technological solutions for accessibility beyond those specified in the guidelines derives from the Appendix to 36 CFR Part 1193 - Advisory Guidance, Introduction, paragraph 1, which notes that “Manufacturers are free to use these [suggested strategies in the Appendix] or other strategies in addressing the guidelines.” We proposed inclusion of this equivalent facilitation provision in the 2011 ANPRM and received no comments.

C101.3 Conventional Industry Tolerances

This proposed section, which has a parallel provision in the proposed 508 Standards (E101.3), would provide that dimensions are subject to conventional industry tolerances except where dimensions are stated as a range. This proposed provision would be new to the 255 Guidelines. It is intended to clarify how dimensions should be interpreted when specified in the text of a guideline or referenced standard.

C101.4 Units of Measurement

This proposed section, which also has a counterpart in the proposed 508 Standards (E101.4), provides that measurements are stated in metric and U.S. customary units and that the values stated in each system (metric and U.S. customary units) may not be

exact equivalents. This section would also provide that each system be used independently of the other. This proposed section is new to the 255 Guidelines, and would clarify dimensions stated in the text of the guidelines or referenced standards.

C102 Referenced Standards

This section identifies the consensus standards that would be incorporated by reference in the proposed 255 Guidelines. The section also proposes that, where there is a difference between a provision of the proposed 255 Guidelines and a referenced standard, the provision of the 255 Guidelines would take precedence.

Incorporation by reference of these standards would be an improvement from the existing 255 Guidelines, which contain no referenced standards. The Advisory Committee strongly recommended the adoption of specific accessibility consensus standards in order to promote harmonization. The adoption of consensus standards results in a more unified regulatory environment in which all participants benefit from clarity and simplicity.

The standards listed in proposed C102 would apply to ICT subject to the 255 Guidelines to the extent that it is readily achievable to do so. The Board is proposing to incorporate by reference the same standards as those incorporated in the proposed 508 Standards. For a discussion of these standards, see Section VI.B (Section-by-Section Analysis – 508 Standards: Application and Scoping – E102).

As noted above, one of the standards proposed for incorporation is WCAG 2.0. As applied telecommunications equipment, this would require manufacturers to conform to WCAG 2.0 when providing electronic content integral to the use of their equipment (under proposed C203.1), a user interface (under proposed C205.2), or support documentation (under proposed C206.1 and 602.3). This would include, for example, consumer manuals for telecommunications equipment posted on manufacturer websites, online registration forms, and interactive consumer support interfaces. A similar provision was proposed in the 2011 ANPRM. Commenters strongly supported incorporation of WCAG 2.0 to web content, but some telecommunications industry groups objected to application of this standard outside the web environment. The Board's bases for applying WCAG 2.0 to non-web ICT is detailed above in the Major Issues section. See Section V.B.2 (Major Issues – WCAG 2.0 Incorporation by Reference – Justification for Applying WCAG 2.0 to Non-Web ICT).

Question 15. The Access Board requests data or other information from telecommunications equipment manufacturers regarding the potential costs and benefits of incorporating WCAG 2.0 by reference and applying its success criteria to both web and non-web environments. What difficulties, if any, do telecommunications equipment manufacturers foresee in applying WCAG 2.0 outside the web environment? Does the WCAG2ICT Task Force's final report provide sufficient guidance concerning application of WCAG 2.0 to non-web ICT? If not, what additional guidance would telecommunications equipment manufacturers find helpful?

C103 Defined Terms

This section sets forth definitions of terms used in, or integral to, the proposed 255 Guidelines. Some of the definitions have been carried over in whole or in part from the existing 255 Guidelines, while others represent terms that are new to these guidelines. Proposed C103 would include nearly all of the same defined terms in the proposed 508 Standards, with the exception of one term (i.e., “agency”) that has no application in the guidelines. We also propose to revise or delete several definitions from the existing 255 Guidelines. Highlighted below are notable changes to, or deletion of, defined terms in the existing 255 Guidelines. For a complete discussion of all defined terms, see Section VI.B. (Section-by-Section Analysis – 508 Standards: Application and Scoping – E103.4).

As with the proposed 508 Standards, the Board proposes to replace the term “electronic and information technology (E&IT)” —which appears in both the existing 255 Guidelines and the 508 Standards— with “information and communication technology (ICT).” The scope and application of the term “ICT” are discussed in detail in the Section-by-Section Analysis of the proposed 508 Standards. See Section VI.B (Section-by-Section Analysis – 508 Standards: Application and Scoping). We note here that ICT is a broad term that encompasses not only information technology and other electronic systems and processes covered by the 508 Standards, but also telecommunications equipment and customer premises equipment subject to the 255 Guidelines. The term “ICT,” moreover, embraces not only telecommunications equipment, but also its related software and electronic content.

We also propose to revise definitions for “customer premises equipment” (CPE) and “specialized customer premises equipment” found in the existing 255 Guidelines to be consistent with current FCC regulations implementing Section 255 of the Communications Act. (See 47 C.F.R. Part 14 (2013)).

Additionally, the Board proposes to add several terms that would be new to the 255 Guidelines. As with the proposed 255 Guidelines, these newly defined terms are being proposed to reflect, among other things, new terminology used in the proposed guidelines or technological changes. One proposed new term is “255 Guidelines.” This term is newly defined in order to provide consistent cross-reference within the guidelines to all chapters that apply to Section 255-covered manufacturers of telecommunications equipment and customer premises equipment, namely: 255 Chapters 1 and 2 (36 CFR Part 1194, Appendix B), and Chapters 3 through 6 (36 CFR Part 1194, Appendix C). This definition is consistent with proposed § 1194.2, as well as usage of the term throughout this NPRM.

Other newly defined terms in the proposed 255 Guidelines are: “application,” “assistive technologies,” “audio description,” “authoring tool,” “closed functionality,” “content,” “hardware,” “keyboard,” “label,” “name,” “operable part,” “programmatically determinable,” “text,” “menu,” “platform accessibility services,” “platform software,” “real-time text,” “software,” “terminal,” and “Voice over Internet Protocol (VOIP).” Each of these new terms is discussed above in the context of the proposed 508 Standards. See

Section VI.B. (Section-by-Section Analysis – 508 Standards: Application and Scoping – E103.4).

Lastly, proposed C103.4 would exclude several terms that are defined in the existing 255 Guidelines. These terms are not included in this proposed rule because either the proposed technical requirement associated with the term sufficiently conveys its meaning (i.e., “accessible,” “readily achievable,” “alternate formats,” “manufacturer,” and “telecommunications equipment”), or the term is not used in the proposed 255 Guidelines (i.e., “agency,” “alternate methods,” “peripheral devices,” and “product”).

255 Chapter 2: Scoping Requirements

This chapter proposes scoping for requirements applicable to telecommunications equipment manufacturers in the design, development, or fabrication of covered ICT that is newly released, upgraded, or substantially changed from an earlier version or model—that is, the types of ICT that would be required to conform to the proposed functional performance criteria and technical requirements in the 255 Guidelines, as well as the conditions under which these provisions would apply.

Proposed 255 Chapter 2 would differ substantially from its counterpart chapter in the proposed 508 Standards due to the exclusion of several provisions that are inapplicable in the context of Section 255. 255 Chapter 2 also simplifies and reorganizes provisions in existing 255 Guidelines §§ 1193.21, 1193.23, 1193.31, 1193.33, 1193.39 and 1193.41. All scoping provisions would now be located in this chapter.

C201 Application

This is an introductory section.

C201.1 Scope

This section proposes that telecommunications equipment and customer premises equipment, as well as related software, would be required to comply with applicable 255 Guidelines when newly released, upgraded, or substantially modified from an earlier version or model.

C201.2 Readily Achievable

The section proposes that, when a telecommunications equipment manufacturer determines that conformance to one or more requirements in Chapter 4 (Hardware) or Chapter 5 (Software) would not be readily achievable, it shall ensure that the equipment or service is compatible with existing peripheral devices or specialized customer premises equipment commonly used by individuals with disabilities to the extent readily achievable. This section mirrors § 1193.21 of the existing 255 Guidelines.

C201.3 Access to Functionality

This section proposes that telecommunications equipment manufacturers ensure that ICT is accessible to, and usable by, individuals with disabilities by providing direct access to all functionality of ICT where readily achievable. This provision is consistent with existing 255 Guidelines § 1193.31.

C201.4 Prohibited Reduction of Accessibility, Usability and Compatibility

This section proposes to prohibit changes in covered ICT that decreases, or has the effect of decreasing, its net accessibility, usability, or compatibility. This provision largely mirrors existing 255 Guidelines § 1193.39. Proposed C201.4 is intended to ensure that accessibility features in existing technology would not be compromised by later alterations in product design. An exception allows for the discontinuation of a product. This provision was proposed in the 2010 ANPRM, but inadvertently omitted from the 2011 ANPRM.

C201.5 Design, Development and Fabrication

This section proposes a general requirement that telecommunications equipment manufacturers evaluate the accessibility, usability, and interoperability of covered ICT during its design, development, and fabrication. This provision is largely based on § 1193.23(a) of the existing 255 Guidelines. We have not, however, retained § 1193.23(b) of the existing 255 Guidelines, which requires telecommunications equipment manufacturers to consider involving people with disabilities in various aspects of product design and development. We do not include this provision in the proposed 255 Guidelines because it is non-mandatory, advisory material only.

C202 Functional Performance Criteria

This is an introductory section.

C202.1 General

This section proposes that when the technical provisions of Chapter 4 and 5 do not address one or more features of covered ICT, the features not addressed must conform to the Functional Performance Criteria specified in Chapter 3. This proposed section is consistent with 255 Guidelines § 1193.41. For a more complete discussion of this section, see Section V.C (Major Issues – Relationship between Functional Performance Criteria and Technical Provisions).

C203 Electronic Content

This is an introductory section.

C203.1 General

The section proposes to require content integral to the use of covered ICT to conform to Level A and Level AA Success Criteria and Conformance Requirements specified for Web pages in WCAG 2.0 or ISO 14289-1(PDF/UA-1), both of which are incorporated by reference in 255 Chapter 1. The meaning and application of this provision is discussed in greater detail in Sections V.A (Major Issues – Covered Electronic Content). A similar provision was proposed in the 2011 ANPRM. We received no adverse comments.

C204 Hardware

This is an introductory section.

C204.1 General

This section proposes that, where covered ICT hardware transmits information or has a user interface, such hardware must conform to the applicable provisions in Chapter 4 (Hardware). Two of the main covered hardware components—real-time text and assistive technology—are discussed above in the Major Issues section. See Section V.D (Major Issues - Real-Time Text), and Section V.E (Major Issues - Assistive Technology).

While the requirements applicable to Section 255-covered hardware are generally the same as those applied in the 508 Standards, proposed C204.1 provides one exception, which in turn, excepts Section 255-covered ICT from conforming to five specific requirements. These exceptions are proposed due to considerations unique to telecommunications equipment. Features associated with these proposed exceptions are not typically found on hand-held portable devices subject to the 255 Guidelines, such as mobile phones. The five excepted requirements for which we are proposing relief, along with the underlying rationale, are listed below:

402 Closed Functionality. If applied to ICT covered by the 255 Guidelines, proposed 402 would require all products with displays to be speech enabled. It would be unreasonable to apply this requirement to consumer products that are less technologically advanced, and, moreover, doing so would likely eliminate less expensive telephony from the marketplace.

407.11 Keys, Tickets and Fare Cards and 409 Transactional Outputs. Keys, tickets, and fare cards are not typically used to operate ICT subject only to the 255 Guidelines. Similarly, these types of products do not typically provide transactional outputs covered by proposed 409.

407.12 Reach Height and 408 Display Screens. The technical requirements specified for reach ranges (proposed 407.12) and display screens (408) are only intended to apply to stationary ICT. It would thus be inappropriate to apply these requirements to mobile telecommunications equipment subject to the 255 Guidelines (e.g., mobile phones, cable modems).

When these five provisions are applicable in the proposed 508 Standards, the exception for commercial non-availability would apply (under proposed E202.6.2), thereby requiring a federal agency to provide a user with disabilities access to, and use of, information by an alternative means that meets his or her identified needs.

Question 16. Is telecommunications equipment covered by Section 255 sufficiently unique to warrant exemption from the five hardware-related accessibility requirements listed in proposed C204.1? Should exceptions from other hardware requirements be added, or, conversely, should any of these five proposed exceptions be removed?

C205 Software

This is an introductory section.

C205.1 General

This section proposes that, where components of ICT transmit information or have a user interface, they must conform to the applicable provisions in Chapter 5 (Software).

C205.2 WCAG Conformance

This section proposes that specified components of covered ICT—namely, user interface components, platform content, and application content—must conform to Level A and Level AA Success Criteria and Conformance Requirements specified for Web pages in WCAG 2.0, which is incorporated by reference in Chapter 1. This requirement is new to the 255 Guidelines. In the Major Issues section above, the Board discusses the benefits of, and issues attendant to, incorporation of WCAG 2.0 into the 255 Guidelines and 508 Standards. See Section V.B (Major Issues – WCAG 2.0 Incorporation by Reference).

C206 Support Documentation and Services

This is an introductory section.

C206.1 General

This section proposes to require that where support documentation or services are provided, they must conform to the proposed provisions of Chapter 6. This proposed requirement is from the existing 255 Guidelines § 1193.33.

D. Functional Performance Criteria and Technical Requirements

Appendix C sets forth proposed functional performance criteria (Chapter 3) and technical requirements (Chapters 4 through 6) that are referenced by, and applied in,

the Application and Scoping provisions in the 508 Standards (Appendix A) and 255 Guidelines (Appendix B). The proposed requirements in Appendix C are based on recommendations from the Advisory Committee unless otherwise noted.

Chapter 3: Functional Performance Criteria

Chapter 3 contains proposed functional performance criteria, which are outcome-based provisions that apply when applicable technical requirements (i.e., Chapters 4 and 5) do not address one or more features of ICT. All sections of this chapter are referenced by scoping provisions in 508 Chapter 2 and in 255 Chapter 2. These functional performance criteria would also be used to determine equivalent facilitation under both the proposed 508 Standards and 255 Guidelines. Accordingly, they are referenced by the equivalent facilitation provisions in 508 Chapter 1 and 255 Chapter 1.

301 General

This is an introductory section.

301.1 Scope

This section proposes that the functional performance criteria in Chapter 3 be applied where either (a) required by 508 Chapter 2 or 255 Chapter 2, or (b) where referenced by other requirements.

302.1 Without Vision

This section proposes to revise the criterion for users who are blind. This provision would clarify the requirements in existing 508 Standards §1194.31(a) and 255 Guidelines §1193.41(a) by specifying that provision of a mode of operation without vision is required when the ICT otherwise provides a visual mode of operation.

302.2 With Limited Vision

This section proposes to revise the functional performance criterion for users with limited vision so that, where a visual mode of operation is provided, one mode of operation that magnifies, one mode that reduces the field of vision, and one mode that allows user control of contrast would be required. This provision contains significant changes from the functional performance criteria in the existing 508 Standards §1194.31(b) and existing 255 Guidelines §1193.41(b). Existing 508 Standards §1194.31(b) requires at least one mode of operation and information retrieval that does not require visual acuity greater than 20/70 to be provided in both audio and enlarged print output working together or independently. Existing 255 Guidelines §1193.41(b) is similar, except that it defines users with limited vision as users possessing visual acuity that ranges between 20/70 and 20/200. For a further discussion of the history of these

proposed changes, see Section IV.E.6 (Rulemaking History – 2010 and 2011 ANPRMs: Significant Issues – Modifications to the Functional Performance Criteria for Limited Vision).

Question 17. Some commenters raised concerns with proposed 302.2 With Limited Vision. They recommended that the Board establish thresholds for how much magnification, reduction, or contrast is sufficient to meet the provision. Should proposed 302.2 be more specific, and if so, what should the thresholds be? Please cite a scientific basis for threshold recommendations.

302.3 Without Perception of Color

This section proposes to add a new functional performance criterion for users with color blindness to better map to technical specifications in the 508 Standards and 255 Guidelines. Section 302.3 would require at least one mode of operation that does not require user perception of color where a visual mode of operation is provided. The technical provisions in existing 508 Standards §§ 1194.25(g) and 1194.21(i), existing 255 Guidelines § 1193.41(c), as well as proposed 407.7, prohibit color coding from being the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

302.4 Without Hearing

This section proposes to revise the criterion for users who are deaf. This provision would clarify the requirements in existing 508 Standards §1194.31(c) and existing 255 Guidelines §1193.41(d) by specifying that provision of a mode of operation without hearing is required when the ICT otherwise provides an auditory mode of operation.

302.5 With Limited Hearing

This section proposes to revise the criterion for users with limited hearing. The existing 508 Standards require at least one mode of operation and information retrieval to be provided in an enhanced auditory fashion. The existing 255 Guidelines require that input, control, and mechanical functions be operable with limited or no hearing. Proposed 302.5 is more specific, and would require at least one mode of operation that improves clarity, one mode that reduces background noise, and one mode that allows user control of volume, when an auditory mode of speech is provided.

302.6 Without Speech

This proposed section would clarify the requirements in existing 508 Standards §1194.31(e) and existing 255 Guidelines §1193.41(h) by specifying that provision of a mode of operation without speech is only required when the ICT provides a spoken mode of operation. This section is primarily intended to address the needs of users who are unable to speak.

302.7 With Limited Manipulation

In this section, the Board proposes to address the functional performance criterion for users with limited manipulation. The provision would require that, when ICT provides a manual mode of operation, it must also provide at least one mode of operation that does not require fine motor control or operation of more than one control at the same time. The existing 508 Standards address the needs of users with limited manipulation and users with limited reach or strength in the same criterion (see § 1194.31(f)). By contrast, the existing 255 Guidelines address the needs of users with limited manual dexterity and users with limited reach or strength in different provisions (see §§ 1193.41(e) and (f)). Because these conditions do not necessarily exist together, their respective accessibility solutions are best presented separately. The criterion for users with limited reach or strength is set forth in proposed 302.8.

302.8 With Limited Reach and Strength

In this section, the Board proposes to address the functional performance criterion for users with limited reach or strength. The existing 508 Standards address the needs of users with limited manipulation and users with limited reach or strength in the same criterion (see § 1194.31(f)). By contrast, the existing 255 Guidelines address the needs of users with limited manual dexterity and users with limited reach or strength in different criteria (see §§ 1193.41(e) and (f)). Because these conditions do not necessarily exist together, their respective accessibility solutions are best presented separately. The criterion for users with limited manipulation is set forth in proposed 302.7.

Chapter 4: Hardware

Chapter 4 contains proposed requirements for hardware that transmits information or has a user interface. Examples of such hardware include computers, information kiosks, and multi-function copy machines. This chapter draws substantively from existing 508 Standards, as well as the technical requirements for automatic teller machines and fare machines in the ADA and ABA Accessibility Guidelines. See 36 CFR Part 1191, Appendix D, section 707. The requirements in this chapter apply under both the proposed 508 Standards and 255 Guidelines absent an express exception.

Most of the proposed hardware requirements are new to the 255 Guidelines. This is because the existing 255 Guidelines parallel only existing 508 Standards §§ 1194.23 Telecommunications products, 1194.31 Functional performance criteria, and 1194.41 Information, documentation, and support. The existing 255 Guidelines do not currently address the other 508 requirements in Subpart B Technical Standards, namely 508 Standards §§ 1194.21 Software applications and operating systems, 1194.22 Web-based intranet and Internet information and applications, 1194.24 Video and multimedia products, 1194.25 Self-contained, closed products, and 1194.26 Desktop and portable computers. A major objective of this rulemaking is to harmonize the 255 Guidelines and 508 Standards.

Yet, while new to the 255 Guidelines, these proposed hardware rules are generally not expected to have a significant cost impact. Due to convergent technologies, a

telecommunications product that previously stood alone may now be part of a more complex system. For example VoIP telephone systems may include a web interface used to operate the telephone. While these products have long been required under existing guidelines to be accessible, see, e.g., 255 Guidelines § 1193.41(a) (requiring telecommunications products be operable without vision), the product-by-product based structure of the guidelines results in a multiplicity of accessibility requirements. This proposed rule aims to address this problem by taking a functional approach across technologies, as well as by adding clarity and detail as to what accessible means. For these reasons, the proposed rule is not expected to impose material new costs on manufacturers of telecommunications equipment and customer premises equipment.

With respect to an increasingly ubiquitous type of ICT hardware—self-service transaction machines—the Board has worked collaboratively with the Departments of Justice (DOJ) and Transportation (DOT) to develop a common set of technical requirements that could be referenced and scoped by these agencies in their respective rulemaking initiatives. While each agency has different regulatory authority, self-service transaction machines can be found in a variety of settings, and the accessibility barriers are generally common across these settings. In late 2013, DOT published a final rule implementing the Air Carrier Access Act that addresses accessibility standards for airline websites and automated kiosks located at domestic airports. See 78 FR 67882 (Nov. 12, 2013). The DOT requirements for automated kiosks are consistent with existing 508 Standards for self-contained, closed products. In 2010, DOJ published an ANPRM to solicit public comment on accessibility requirements under the Americans with Disabilities Act for furniture and equipment. See 75 FR 43452 (July 26, 2010). Such requirements would cover, among other things, kiosks, interactive transaction machines, and point-of-sale devices. In a future rulemaking, the Board may update the ADA and ABA Accessibility Guidelines to harmonize those guidelines with the proposed 508 Standards and the 255 Guidelines, once finalized.

401 General

This is an introductory section.

401.1 Scope

This section proposes that the technical requirements for hardware in Chapter 4 be applied where (a) required by 508 Chapter 2 or 255 Chapter 2, or (b) where referenced by other requirements. Assistive technology hardware would be excepted from conformance with this chapter. This exception is proposed in response to public comments to the 2010 and 2011 ANPRMs that sought clarification on this point. Commenters expressed the concern that, should this scoping section be read as obligating assistive technology hardware to meet the requirements of this chapter, some assistive technology would not be able to serve its function. For example, people with very low muscle tone might use a specialized membrane keyboard that is completely flat, with no tactilely discernible separation between the keys, because it is the most optimal input device for them. This type of specialized keyboard, however, would not be permitted under proposed 407.3, which addresses tactilely discernible input controls. In

light of the specialized nature of assistive technology, the Board proposes it be excepted from the technical requirements in this chapter.

402 Closed Functionality

This is an introductory section.

402.1 General

This section proposes to require ICT with closed functionality to be operable without requiring the user to attach or install assistive technology, with the exception of personal headsets or other audio couplers. This provision is needed because, when ICT has closed functionality, the end user typically does not have the option of installing or attaching assistive technology. Closed functionality can also apply to the platform user interface. This is sometimes referred to as “firmware” because it has a software aspect, but is not alterable by the end-user and the user interface is necessarily tied to the hardware platform. The proposed technical requirements for software (Chapter 5) do not specifically address closed functionality, except for the interoperability of software and assistive technology.

Components of ICT subject to the 255 Guidelines would be excepted from the requirements of this section (see C204.1 Exception) because such telecommunications equipment typically has closed functionality. For example, it is often impossible to attach or install assistive technology, such as a specialized keyboard.

Variable message signs (VMS) frequently are installed in federal buildings and facilities to provide information about ongoing events. Some VMS also convey information relevant to emergencies. VMS with closed functionality would be covered by this section. The Board is currently unaware of any VMS technology that provides audible output. However, there is one voluntary consensus standard addressing accessibility of VMS with respect to the needs of persons with low vision. The most recent edition of the International Code Council (ICC)’s “Accessible and Usable Buildings and Facilities” (ICC A117.1-2009) contains specifications for making high-resolution and low-resolution VMS more accessible to people with low vision. For low-resolution signs, these requirements address signage characters (e.g., case, style, height, width, stroke width, and spacing), as well as other characteristics relating to height above the floor, finish, contrast, protective coverings, brightness, and rate of change. High-resolution VMS need only comply with the provisions for character case (uppercase), protective coverings, brightness, and rate of change since they typically meet or exceed the other specifications. In addition, section 1110.4 of the 2012 edition of the International Building Code requires VMS in transportation facilities and in emergency shelters to comply with ICC A117.1 unless equivalent information is provided audibly. The IBC, however, does not require the VMS, itself, to provide the audible message. For example, in a transportation facility, information equivalent to the VMS display can be provided through a public address system.

Question 18. In the final rule, the Board is considering incorporating by reference the requirements for VMS in ICC A117.1-2009—or its successor ICC A117.1-2015, if the standard has been finalized by that time—in order to make such signs more accessible to individuals who are blind or have low vision. The Board seeks comment on the advisability of incorporating by reference the requirements in ICC A117.1-2009 (or its successor) for variable message signs. Are there technologies that would allow a user to receive an audible message generated by the VMS sign? If so, the Board requests that commenters provide information regarding this technology. Until VMS can be made directly accessible to persons who are blind, we recognize that VMS would have to be paired with audible public address announcements. If VMS cannot be speech enabled, should the Board require VMS to, at least, be accessible to people with low vision?

402.2 Speech-Output Enabled

This section proposes to require ICT with closed functionality that has a display screen to be speech-output enabled. This means that operating instructions and orientation, visible transaction prompts, user input verification, error messages, and all displayed information necessary for full use, would have to be accessible to and usable by individuals with vision impairments. In actual practice, for all but the simplest ICT (e.g., hardware without display screens), this means ensuring that the ICT has built-in speech output. This explicit requirement would be new to the 508 Standards. That is, while the requirement in existing 508 Standards §1194.25(a) has been interpreted as requiring ICT with closed functionality to provide speech output since that is the only means of making such products “usable by people with disabilities without requiring an end-user to attach assistive technology,” there is currently no express mandate for speech output. This proposed section contains two exceptions, which exempt specific types of information from speech output requirements, as discussed below.

Exception 1 to 402.2 Speech-Output Enabled

This section proposes to exclude from the requirement for speech output any user inputted content that is not displayed as entered for security purposes, such as when asterisks are shown on-screen instead of personal identification numbers. Excluded material may be delivered as audible tones, rather than as speech.

Exception 2 to 402.2 Speech-Output Enabled

This section proposes to permit visible output that is not necessary for the transaction being conducted—such as advertisements and similar material—from the requirement for audible output.

402.2.1 User Control

This section proposes requirements for user control of speech-enabled output concerning interruption upon selection of a transaction, as well as repeat and pause capabilities. This section is similar to § 1194.25(e) of the existing 508 Standards.

402.2.2 Braille Instructions

This section proposes that, where displays for ICT with closed functionality are required to have speech output, instructions for initiating the speech mode be provided in braille. Braille instructions would be required to conform to specifications for braille in the ADA and ABA Accessibility Guidelines. See ADA and ABA Accessibility Guidelines, 36 CFR Part 1191, Appendix D, section 703.3. This requirement would be new to the 508 Standards. For telecommunications equipment and customer premises equipment subject to Section 255, this requirement is inapplicable; an exception to proposed C204.1 expressly exempts such ICT from this hardware requirement. This proposal was included in the 2011 ANPRM, and the Board received no comments.

402.3 Volume

This section proposes to require two alternate standards for volume control and output amplification on ICT with closed functionality that delivers sound, depending on whether such sound is being conveyed for private or non-private listening. An exception also provides that ICT conforming to 410.2, which addresses volume gain for ICT with two-way voice communication, would be exempted from complying with this section.

402.3.1 Private Listening

This section proposes to require that, where ICT subject to 402.3 provides a mechanism for private listening—such as a handset or headphone jack—it must have a mode of operation for controlling the volume, and provide a means for effective magnetic wireless coupling to hearing technologies. This proposed requirement would be new to the 508 Standards.

402.3.2 Non-private Listening

This section proposes to require that, where ICT subject to 402.3 provides non-private listening, incremental volume control must be provided with output amplification up to a level of at least 65 dB. In addition, where the ambient noise level of the environment is above 45 dB, a volume gain of at least 20 dB above the ambient level would be required and must be user selectable. This provision would require a function to be provided to automatically reset the volume to the default level after every use. This section closely corresponds to § 1194.25(f) in the existing 508 Standards.

402.4 Characters

This section proposes to require that at least one mode of characters displayed on a screen be in sans serif font. In addition, where ICT does not provide a screen

enlargement feature, characters would be required to have a minimum height requirement of 3/16 inch based on the uppercase letter “l.” This section would also require that characters contrast with their background with either light characters on a dark background or dark characters on a light background. This section would be new to the 508 Standards.

403 Biometrics

This is an introductory section.

403.1 General

This section proposes to prohibit biometrics from being the only means for user identification or control unless at least two different biometric options using different biological characteristics are provided. This new exception was recommended by the Advisory Committee. Without the added exception, the language in this section is substantially unchanged from § 1194.25(d) of the 508 Standards, but would be new to the 255 Guidelines.

404 Preservation of Information Provided for Accessibility

This is an introductory section.

404.1 General

This section proposes to prohibit ICT that transmits or converts information or communication from removing non-proprietary information provided for accessibility or, if the non-proprietary information or communication is removed, this section would require that it be restored upon delivery. For example, a video or multimedia presentation with closed captioning would be required to retain the caption encoding, or, if removed in transmission, then restore such encoding upon delivery. This provision closely models §§ 1194.23(j) and 1193.37 of the 508 Standards and 255 Guidelines, respectively.

405 Flashing

This is an introductory section.

405.1 General

This section proposes that, where ICT emits lights in flashes, there can be no more than three flashes in any one-second period. An exception would allow small flashes not exceeding the general flash and red flash thresholds defined in Success Criterion 2.3.1 of WCAG 2.0 because such flashes do not pose seizure risks to users. This requirement is based on recommendations from the Advisory Committee. This proposed section closely corresponds to existing 508 Standards §§ 1194.21(k),

1194.22(j), and 1194.25(i), and is similar to § 1193.43(f) of the existing 255 Guidelines. The flash rate specification in this section is supported by scientific studies on seizures and photosensitivity.⁹

406 Standard Connections

This is an introductory section.

406.1 General

This section proposes that, where ICT provides data connections used for input and output, at least one of each type of data connection conform to industry standard non-proprietary formats, e.g., jacks and plugs. This proposed section closely corresponds to § 1194.26(d) of the existing 508 Standards and § 1193.51(a) of the existing 255 Guidelines. The intent of this provision is to support compatibility with assistive technology hardware.

407 Operable Parts

This is an introductory section.

407.1 General

This section addresses accessibility features of operable parts—such as keys and controls—when part of the user interface is hardware. This section proposes to require operable parts of ICT to conform to the technical requirements in proposed 407.2, 407.3, and 407.4. This section is consistent with requirements in existing 508 Standards §§ 1194.21 and 1194.25, along with § 1193.41(f) of the existing 255 Guidelines.

407.2 Contrast

This section proposes that keys and controls, where provided, contrast visually from background surfaces. Characters and symbols would have to provide this contrast with either light characters or symbols on a dark background or dark characters or symbols on a light background. The goal of this section is to make operable parts of hardware

⁹ See, e.g., Graham Harding et al., Photic- and Pattern-Induced Seizures: Expert Consensus of the Epilepsy Foundation of America Working Group, 46 Epilepsia 1426 (2005); Arnold Wilkins, et al., Characterizing the Patterned Images That Precipitate Seizures and Optimizing Guidelines to Prevent Them, 46 Epilepsia 1212 (2005); see also Ofcom, Guidance Notes Section 2: Harm & Offence for Licensees on Flashing Images and Regular Patterns in Television (Issue Ten: July 2012), available at <http://stakeholders.ofcom.org.uk/binaries/broadcast/guidance/831193/section2.pdf>; Information about Photosensitive Seizure Disorders, Trace Research & Development Center (June 2009), <http://trace.wisc.edu/peat/photosensitive.php>.

on ICT more usable for persons with low vision. A contrast requirement for hardware was recommended by the Advisory Committee. It would be new to the 508 Standards and 255 Guidelines.

407.3 Tactilely Discernible

This section proposes to require that at least one tactilely discernible input control conforming to the requirements of this section be provided for each function. ICT containing touchscreens is widely used in the marketplace. Touchscreens currently are not generally tactilely discernible. This requirement would not prohibit use of touchscreens, membrane keys, or gesture input, provided there is at least one alternative method of input that is tactilely discernible. The intent of this proposed section is to address the difficulty certain people with visual and dexterity impairments often have when using touchscreens. This section, which contains subsections for three types of functions (i.e., identification, alphabetic keys, and numeric keys) is new to the 255 Guidelines, but is consistent with existing 508 Standards §§ 1194.23(k) (1)-(k) (4), with some changes as discussed below.

The Board is also proposing an exception to the requirement for tactile discernibility for touchscreen-based devices in today's marketplace that have proven to be accessible to—and popular with—people with visual disabilities. Specifically, the proposed exception would exempt devices for personal use offering input controls that (a) are audibly discernible without activation, and (b) operable by touch. Examples of currently available devices without tactilely discernible keyboards that are still navigable and usable by individuals with visual disabilities include devices offered by Apple with the iOS-based VoiceOver feature, such as the iPhone® and iPad®. Technology has evolved to the point where touch screens can be made navigable by blind users. Keyboards are an optional design feature. This proposed exception would be a significant departure from the 508 Standards and 255 Guidelines, but more accurately reflects the state of current technology. We welcome comment on this proposed approach.

In addition, the Board is considering adding to the final rule a requirement that at least one type of input technology on ICT with touch screens be compatible with a prosthetic, similar to the requirement in existing 255 Guidelines § 1193.51(c).

Question 19. Does the proposed exception to the requirement for tactilely discernible input controls strike the appropriate balance so that it permits innovative accessibility approaches for individuals with visual impairments without being overbroad? Should there be additional requirements for touchscreens? For example, should the Board require touchscreens to be compatible with prosthetic devices?

407.3.1 Identification

This section proposes to require input controls to be tactilely discernible without activation, as well as operable by touch. It also would require key surfaces outside active areas of display screens to be raised above their surrounding surfaces. The Board notes that, by requiring raised key surfaces, it does not thereby intend to prohibit

contouring of keys. Users with limited manual dexterity may prefer concave keys. Contoured keys would be permitted under proposed 407.3.1, for example, by providing keys with raised edges and concave centers, as is often used on computer keyboards and landline telephone keypads. This section is new to the 255 Guidelines, but is similar to existing 508 Standards §§ 1194.23(k) (1), 1194.25(c), and 1194.26(b). It is also consistent with the requirements for input controls in the ADA and ABA Accessibility Guidelines. See 36 CFR Part 1191, Appendix D, section 707. This is not a material change from the existing standards, and therefore, imposes no new costs.

Question 20. Some industry commenters to the 2011 ANPRM suggested that the Board permit concave—as well as raised—key surfaces. What would be the impact on accessibility if proposed 407.3.1 instead prohibited key surfaces outside the active area of the display screen from being flush with surrounding surfaces?

407.3.2 Alphabetic Keys

This section proposes to require alphabetic keys, where provided, to be arranged in a traditional QWERTY layout, with tactilely distinct letter “F” and “J” keys. The requirement for tactilely discernible home row keys derives from existing 508 Standards § 1194.23(k) (1), but would be a new requirement for the 508 Standards and 255 Guidelines. The intent of this section is to address identification and orientation when alphabetic key entry is used. This section was added to the proposed rule at the request of commenters to the 2011 ANPRM, who suggested that a requirement for alphabetic keys was needed to complement the proposed requirement for numeric key layout (proposed 407.3.3). Where a numeric keypad with an alphabetic overlay is provided (such as on a telephone keypad), the relationships between letters and digits would be required to conform to ITU-T Recommendation E.161, as incorporated by reference in 508 Chapter 1 and 255 Chapter 1.

This requirement for a QWERTY layout in keyboards and conformance to ITU-T Recommendation E.161, while new to the 508 Standards and 255 Guidelines, represents current design practice. Accordingly, there should be no additional cost associated with this provision.

407.3.3 Numeric Keys

This section proposes to require numeric keys, where provided, to be arranged in a 12-key ascending or descending keyboard layout, with a tactilely distinct number “5” key. The requirement for a tactilely discernible “5” key derives from existing 508 Standards § 1194.23(k) (1), but would be a new requirement for the 508 Standards and 255 Guidelines. The intent of this section is to address identification and orientation when numeric data entry is used.

407.4 Key Repeat

This section proposes to require that, where a keyboard with a key repeat feature is provided, the delay before activation of the key repeat feature must be fixed at, or adjustable to, 2 seconds minimum. The intent of this section is to address the unintentional activation of keys by people with dexterity impairments. The proposed requirement closely corresponds to existing 508 Standards §§ 1194.23(k) (3), 1194.25(c), and 1194.26(b), but is new to the 255 Guidelines. Because telecommunications products generally do not have a key repeat feature, the Board expects the impact of this provision on telecommunications equipment manufacturers to be negligible.

407.5 Timed Response

This section proposes to require that where a timed response is required, ICT would have to alert the user visually, as well as by touch or sound. It would also have to provide the user an opportunity to indicate that more time is needed. The intent of this section is to afford people with certain disabilities—namely, those relating to manual dexterity, cognitive disabilities, or otherwise affecting response time—additional time to complete a task, if needed. The proposed requirement is consistent with existing 255 Guidelines § 1193.41(g), and closely corresponds to existing 508 Standards §§ 1194.25(b) and 1194.22(p).

407.6 Status Indicators

This section would require status indicators, including all locking or toggle controls or keys, such as “Caps Lock” and “Num Lock,” to be discernible visually and by either touch or sound. The intent is to ensure that users who are blind can determine the status of locking or toggle keys audibly or by touch, and that users who are deaf can make this determination visually. This proposed provision closely corresponds to existing 508 Standards §§ 1194.23(k) (4), 1194.25(c), and 1194.26(b), but would be new to the 255 Guidelines. While new to the 255 Guidelines, status indicators for Caps Lock and Num Lock controls represent current design practice. Accordingly, there should be no additional cost associated with this provision.

407.7 Color

This section proposes to prohibit color-coding from being the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element. The proposed section is the same as existing 508 Standards § 1195.25(g), and is consistent with 255 Guidelines § 1193.41(c). The use of color is also addressed in existing 508 Standards § 1194.22(c), which requires that Web pages “be designed so that all information conveyed with color is also available without color, for example from context or mark up.” The intent of the proposed section is to address the needs of people who are color blind or have low vision. The proposed prohibition on color-coding represents current practice in the design of electronic content and, therefore, should not result in any additional cost.

407.8 Audio Signaling

This section proposes to prohibit audio signaling from being the only means of conveying information, indicating an action, or prompting a response. For example, when a landline telephone provides a stutter tone to indicate a voice mail message, such a tone is typically accompanied by an activated light on the phone. This proposal closely parallels the prohibition in existing 508 Standards § 1194.25(g) against use of color as the only means of conveying information. The section is intended to address the needs of individuals with hearing impairments in the same way that proposed 407.7 addresses the needs of persons who have color blindness. Although an express prohibition on audio signaling would be new to the 508 Standards and 255 Guidelines, such a prohibition is implied by the existing functional performance criteria (508 Standards § 1194.31(c)), and represents current industry practice. This proposed provision should not, therefore, result in any significant cost increase.

407.9 Operation

This section would require ICT with operable parts to provide at least one mode of operation that is operable with one hand, and prohibits operable parts requiring tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts would be limited to 5 lbs. (22.2 N) maximum. The proposed requirement closely corresponds to existing 508 Standards §§ 1194.23(k) (2), 1194.25(c), and 1194.26(b), and is consistent with existing 255 Guidelines §§ 1193.41(e) and (f). This section is aimed at addressing the needs of people with manual dexterity impairments when using operable parts.

407.10 Privacy

This proposed section would require the same degree of privacy of input and output for all individuals. For example, individuals using a speech output mode must be afforded the same degree of privacy as those using a display screen. The proposed requirement would be new to both the 508 Standards and 255 Guidelines. ATMs and Fare Vending Machines, as addressed in the ADA and ABA Accessibility Guidelines (36 CFR Part 1191, Appendix D, section 707.4), typically support compliance with this requirement by providing a handset or audio jack. Additionally, this proposed section would prohibit screens from automatically going blank when the speech function is engaged. Many people with low vision use speech output to supplement or reinforce on-screen prompts. Consequently, automatically blanking the screen would render the ICT less accessible to these users. Provision of an option for users to blank the screen, however, may be helpful to individuals who desire greater privacy.

407.11 Keys, Tickets, and Fare Cards

This section would require that, when kiosks or other ICT provide a key, ticket, or fare card, those objects have a tactilely discernible orientation, if orientation is important to the object's further use. This requirement would be new to the 508 Standards and 255

Guidelines, and is intended to address the needs of individuals with visual impairments. This section is identical to the recently issued final rule by the Department of Transportation concerning the accessibility of tickets and boarding passes issued by shared-use automated kiosks at airport facilities. See Nondiscrimination on the Basis of Disability in Air Travel: Accessibility of Web Sites and Automated Kiosks at U.S. Airports, 78 FR 67882 (Nov. 12, 2013) (to be codified at 49 CFR Part 27). ICT subject to the 255 Guidelines would be expressly exempted from the requirements of this section (by proposed C204.1 Exception) because telecommunications equipment does not typically issue keys, tickets, or fare cards.

407.12 Reach Height

This section proposes requirements for the height of side and forward reaches that would enable persons using wheelchairs or other mobility aids to reach and operate at least one of each type of operable part. This proposed section would apply only to ICT that is stationary. By “stationary,” the Board means that the ICT, once put in place, is not intended to be relocated for routine use. Proposed 407.12 parallels existing 508 Standards § 1194.25(j), which applies side reach requirements to ICT that is “freestanding, non-portable, and intended to be used in one location.” We are proposing to use the term “stationary” to address concerns that the word “freestanding” implies an independent supporting structure that may not always be in place, such as with a multifunction printer specifically designed for table-top or desk-top use.

Specifically, this section would establish requirements for position (i.e., vertical reference plane), forward reach, and side reach. This section proposes maximum and minimum reach heights for either forward (over the lap) or side reaches to stationary ICT. Existing 508 Standards § 1194.25(j) only provides specifications for side reaches to operable parts of ICT. This section would provide greater design flexibility by permitting controls to be configured for either forward reach (407.12.3) or side reach (407.12.2). This flexibility would allow manufacturers to assess conformance prior to sale and independent of factors outside their control. For example, a manufacturer cannot control the installation location once ICT is purchased. However, because controls are designed to be within reach, the purchaser can then ensure that the ICT is located so that at least one of each type of control is accessible to individuals with disabilities. ICT subject to the 255 Guidelines would be expressly exempted from the requirements of this section (by proposed C204.1 Exception) because it is not typically stationary.

Question 21. Should the requirements for reach height in proposed 407.12 apply to ICT subject to the 255 Guidelines, such as, for example, routers attached to racks? The Board asks that telecommunications equipment manufacturers provide information on the costs of such a requirement. Are there alternative ways of making these components accessible? We welcome comments on suggested approaches.

407.12.1 Vertical Reference Plane

This section proposes that the positioning of operable parts for side reaches and forward reaches be determined with respect to a vertical reference plane, with the location and length of the plane dependent on the type of reach. The provisions for a side reach in existing 508 Standards § 1194.25(j) (1) contain references to this same vertical reference plane.

407.12.1.1 Vertical Plane for Side Reach

This section proposes that, where a side approach is provided, the vertical reference plane must have a minimum length of 48 inches. The 48-inch dimension is based on the length of a stationary occupied wheelchair. This side reach requirement mirrors existing 508 Standards § 1194.25(j) (1) and Figure 1.

407.12.1.2 Vertical Plane for Forward Reach

This section proposes that, where a forward reach is provided, the vertical reference plane must be, at a minimum, 30 inches long. The 30-inch dimension is based on the width of a stationary occupied wheelchair. This dimension is consistent with the ADA and ABA Accessibility Guidelines (36 CFR Part 1191, Appendix D, section 305.5).

407.12.2 Side Reach

This section specifies proposed requirements for operable parts providing unobstructed or obstructed side reaches. It proposes to limit the height of the portion of the ICT over which a person must reach to access controls to 34 inches maximum in height. Although the existing 508 Standards do not include a maximum height for the portion of the ICT over which a person must reach, the proposed 34 inches maximum height is consistent with ICC A117.1-2009, as well as the ADA and ABA Accessibility Guidelines (36 CFR Part 1191, Appendix D, section 308). Without such a height limitation, controls at 48 inches could be out of reach if an obstruction blocked a user's arm and impeded his or her reach to the controls.

407.12.2.1 Unobstructed Side Reach

This section proposes that, where the operable part is located 10 inches or less behind the vertical reference plane, the operable part must be 48 inches high maximum and 15 inches high minimum above the floor. Although existing 508 Standards § 1194.25 (j) (2) permits a maximum reach height of 54 inches, it contains the same minimum height (15 inches) and 10-inch reach depth. The proposed lowering of the maximum height for unobstructed side reach (i.e., from 54 inches in the existing 508 Standards to 48 inches in this proposed rule) reflects a similar change in 2004 to the ADA and ABA Accessibility Guidelines. See 36 CFR Part 1191, Appendix D, section 308.3. This proposed maximum height is also consistent with accessible reaches specified in the 1998 edition, as well as two subsequent editions, of the ICC A117.1.

407.12.2.2 Obstructed Side Reach

This section proposes that, where the operable part is located more than 10 inches, but not more than 24 inches, behind the vertical reference plane, the height of the operable part must be 46 inches maximum and 15 inches minimum above the floor. In addition, the operable part would not be permitted to be located more than 24 inches behind the vertical reference plane. Although it is editorially revised, this section is the same as existing 508 Standards §§ 1194.25(j) (3) and 1194.25(j) (4).

407.12.3 Forward Reach

This section contains proposed requirements for operable parts providing either an unobstructed or obstructed forward reach. This section proposes to limit the height of an obstruction that must be reached over to operate the control to 34 inches in height. The 34-inch height restriction is consistent with the ADA and ABA Accessibility Guidelines. See 36 CFR Part 1191, Appendix D, section 308. The proposed provision would also require the vertical reference plane to be centered on, and intersect with, the operable part.

As noted previously, the existing 508 Standards do not provide specifications for forward reaches. While this requirement (and its subsections) would thus be new to the existing 508 Standards, it nonetheless would provide greater design flexibility by permitting controls to be configured for forward reach (or, alternatively, side reach), at the manufacturer's discretion.

407.12.3.1 Unobstructed Forward Reach

This section proposes that, where an unobstructed forward reach is provided, the operable part must be located 48 inches high maximum and 15 inches high minimum above the floor. An unobstructed forward reach, for purposes of this section, occurs when the operable part is located at the leading edge of the maximum protrusion within the length of the vertical reference plane of the ICT. These dimensions and their resulting geometry are consistent with the ADA and ABA Accessibility Guidelines (36 CFR Part 1191, Appendix D, sections 306 and 308).

407.12.3.2 Obstructed Forward Reach

This section proposes that, where an obstructed forward reach is provided, the maximum allowable forward reach to an operable part would be 25 inches. An obstructed forward reach, for purposes of this section, occurs when the operable part is located behind the leading edge of the maximum protrusion within the length of the vertical reference plane of the ICT. In addition, this proposed section also contains subsections, as discussed below, establishing maximum heights for operable parts with obstructed forward reaches, as well as dimensions for knee and toe spaces. These dimensions and their resulting geometry are consistent with the ADA and ABA Accessibility Guidelines (36 CFR Part 1191, Appendix D, sections 306 and 308).

407.12.3.2.1 Height

This section, presented in tabular form (Table 407.12.3.2.1), proposes alternative maximum heights for operable parts with obstructed forward reaches depending on reach depth. As specified in this table, if the reach depth of the operable part is less than 20 inches, then the operable part must be no higher than 48 inches. If the reach depth of the operable part is 20 inches to 25 inches, then the operable part must be no higher than 44 inches. These dimensions and their resulting geometry are consistent with the ADA and ABA Accessibility Guidelines (36 CFR Part 1191, Appendix D, sections 306 and 308).

407.12.3.2.2 Knee and Toe Space

This section proposes dimensions for knee and toe space under ICT when an obstructed forward reach is provided. The dimensions necessary to accommodate the full knee and toe space under ICT would be 27 inches high minimum, 25 inches deep maximum, and 30 inches wide minimum. This knee and toe space would also have to be clear of obstructions. These dimensions and their resulting geometry are consistent with the ADA and ABA Accessibility Guidelines (36 CFR Part 1191, Appendix D, sections 306 and 308).

There are two proposed exceptions to this knee and toe space requirement. First, toe space with a reduced clear height of 9 inches (rather than 27 inches) would be permitted for a depth of no more than 6 inches. Building on this exception, the second exception would allow further reduction in the height of the space along the profile of the knee to the toe sloping at 6:1 toward the maximum protrusion of the ICT. This means that, for every 6 inches of height, the line can move toward the maximum protrusion of the ICT up to 1 inch or, put another way, 6 inches of rise to 1 inch of run. These two exceptions allow ICT to provide space beneath operable controls for ICT for knees and toes, or a portion of knees and toes, depending on the location of the controls.

408 Display Screens

This is an introductory section.

408.1 General

This section proposes to require that, where stationary ICT provides one or more display screens, at least one of each type of screen must be visible from a point located 40 inches above the floor space where the display screen is to be viewed. The word “stationary” in this proposed section would have the same meaning as in proposed 407.12. The intent of this provision is to ensure that display screens are viewable by individuals who use wheelchairs or other mobility aids. This would be a new requirement for the 508 Standards. ICT subject to the 255 Guidelines would be expressly exempted from the requirements of this section (by proposed C204.1 Exception) because such equipment is not typically stationary.

Question 22. The visibility requirements for display screens in section 408.1 apply only to stationary ICT (i.e., ICT that is not intended to be moved once put in place), and, consequently, would not generally apply to telecommunications equipment subject to the 255 Guidelines—such as cable modems and routers. Should the requirements for display screens apply to ICT subject to the 255 Guidelines?

In addition to the proposed requirements above, the Board is considering establishing a requirement for the angle of the display screen to be adjustable, so that a person using a wheelchair or other mobility aid could see the entire viewable area of the display screen and minimize the effect of glare.

Question 23. Should the Board add a requirement that the viewing angle of display screens be adjustable to permit wheelchair users or persons of small stature to see the entire viewable area of such screens and minimize glare? Are there other characteristics of display screens that would make them more viewable to persons who use wheelchairs or other mobility aids?

409 Transactional Outputs

This is an introductory section.

409.1 General

This section proposes that, where transactional outputs—such as tickets and receipts—are provided by ICT with speech output, the speech output must contain all information necessary to complete or verify a transaction. As applied to ICT with closed functionality and display screens required to be speech-output enabled under proposed 402.2, this section would require all information necessary to complete or verify a transaction, including information printed on receipts or tickets, to be provided audibly.

This proposed requirement in 409.1 would be new to the 508 Standards. ICT subject to the 255 Guidelines would be expressly exempted from the requirements of this section (by proposed C204.1 Exception) because telecommunications equipment generally does not provide transactional outputs. For ICT covered by the 508 Standards, there would be exceptions for three specific types of transactional outputs: information unrelated to the substance of particular transactions (e.g., machine location and identifier, time of transaction); information already presented audibly during the same transaction; and, lastly, itineraries, maps, and other visual images. Each of these exceptions is discussed below.

Question 24. Do the three proposed exceptions to 409.1 adequately cover the types of information that should be exempted from the requirement for audible presentation of transactional outputs? Are there other types of information typically provided on transaction outputs that should be exempted? Should the Board limit the types of transactional outputs required to be presented audibly to certain types of outputs, e.g., tickets or sales receipts?

Exception 1 to 409.1

Proposed Exception 1 would exempt information regarding the machine location, date and time of transaction, customer account number, and the machine identifier from the proposed requirement for audible transaction output. Although this information may be on printed receipts and other transactional outputs, it is not typically consulted by the user during, or immediately following, a transaction. This proposed exception is based on an exception to the requirements for speech output at Automated Teller Machines and Fare Vending Machines in the ADA and ABA Accessibility Guidelines. See 36 CFR Part 1191, Appendix D, section 707.5.2 Exception 1.

Exception 2 to 409.1

Proposed Exception 2 would exempt all information that is part of a transactional output from the proposed requirement if it has already been presented audibly at another point during the same transaction. For example, if a user purchasing stamps on a self-service U.S. Post Office machine selected a particular commemorative stamp and the selected stamp name was presented in an audible format previously in that same transaction, it need not be repeated when the machine issues the stamp.

Exception 3 to 409.1

Proposed Exception 3 would exempt itineraries, maps, or other visual images that are provided on ticketing machines from being required to be presented in an audible format. This exception is proposed in recognition of the technical challenges posed by audible presentation of visual images.

Question 25. Are there requirements in proposed Exception 3 to 409.1 sufficiently clear?

410 ICT with Two-Way Voice Communication

This is an introductory section.

410.1 General

This section addresses the accessibility of telecommunications equipment that offers two-way voice communication (i.e., an interactive, multi-party voice communication occurring in real time), including both older technologies (such as landline telephones and two-way pagers) and more modern ICT (such as mobile wireless devices). It would also apply to two-way video communication when the video also transmits voice communication. Proposed 410.1 would require ICT with two-way voice communication functionality to conform to the technical requirements in proposed 410.2 through 410.8, which cover, among other things: volume gain magnetic coupling, minimization of interference, real-time text functionality, and video communication.

410.2 Volume Gain

This section proposes to require ICT with two-way communication to provide volume gain conforming to the FCC's current regulation at 47 CFR 68.317, which establishes technical standards for volume control on analog and digital telephones to facilitate hearing aid compatibility. The proposed section would replace existing 508 Standards § 1194.23(f) and existing 255 Guidelines § 1193.43(e). The Advisory Committee recommended that the Board adopt the FCC's volume gain requirements for landline ICT with two-way voice communication.

In July 2013, the FCC issued a request for comment on a petition for rulemaking filed by a telecommunications industry group requesting that the agency revise its hearing aid compatibility volume control gain requirements for analog and digital telephones.¹⁰ The Telecommunications Industry Association (TIA) petition urged the Commission to issue a notice of proposed rulemaking to, among other things, update its Part 68 rule to incorporate the most recent TIA standard for hearing aid compatibility volume control on telephones: ANSI/TIA-4965, Receive Volume Control Requirements for Digital and Analog Wireline Handset Terminals (2012). 28 FCC Rcd. at 10338-39. At present, the Commission's regulation at § 68.317 sets forth separate requirements for analog and digital telephones based on speech amplification metrics known as "Receive Objective Loudness Rating" (ROLR). ANSI/TIA-4965, on the other hand, uses a new amplification metric—referred to as "conversational gain"—to establish requirements for both analog and digital telephones.

While the "conversational gain" method of measuring amplification for wireline phones in ANSI/TIA-4965 may hold promise, it would be premature for the Board to reference this standard unless and until it is adopted by the FCC. As the lead regulatory agency on hearing aid compatibility standards for wireline telephones, the FCC is in the best position to assess the technical merits, as well as costs and benefits, of referencing this new TIA standard in any subsequent revisions to its existing regulation in Part 68.

Question 26. The Board proposes to adopt 47 CFR 68.317, which is the FCC's current regulatory standard addressing volume control for analog and digital telephones. In the future, should the FCC revise its regulation and incorporate by reference ANSI/TIA-4965 (or any other consensus standard) for wireline phones, the Board plans to update its regulations—as needed—to reflect revisions by the Commission. We seek comment on this proposed course of action.

410.3 Magnetic Coupling

This section proposes to require that, where ICT with two-way voice communication delivers output by an audio transducer that is typically held up to the ear, it provide a means for effective magnetic wireless coupling to hearing technologies, such as hearing aids, cochlear implants, and assistive listening devices. This section is equivalent to §§

¹⁰ See Request for Comment on Petition for Rulemaking filed by the Telecommunications Industry Association Regarding Hearing Aid Compatibility Volume Control Requirements, 28 FCC Rcd. 10338 (July 19, 2013) (TIA Petition). The comment period on this petition closed in September 2013. Id.

1194.23(h) and 1193.43(i) of the existing 508 Standards and 255 Guidelines, respectively.

410.4 Minimize Interference

This proposed section would require wireless handsets and digital wireless devices to reduce interference with hearing technologies to the lowest possible level, with interference specifications set forth in proposed subsections 410.4.1 (wireless handsets) and 410.4.2 (digital wireline). This section closely corresponds to existing 508 Standards § 1194.23(i) and 255 Guidelines § 1193.43(h), but also incorporates by references consensus standards developed since the 508 Standards and 255 Guidelines were published.

The proposed subsections 410.4.1 and 410.4.2 refer to industry-accepted standards for performance requirements for mobile and landline telephones.

410.4.1 Wireless Handsets

This section proposes that ICT in the form of wireless handsets—that is, cellular telephones—would be required to conform to ANSI/IEEE C63.19-2011, as incorporated by reference in 508 Chapter 1 and 255 Chapter 1.

410.4.2 Digital Wireline

This section proposes that ICT in the form of digital wireline devices (such as VoIP-based office desk telephones) would be required to conform to TIA 1083, as incorporated by reference in 508 Chapter 1 and 255 Chapter 1.

410.5 Digital Encoding of Speech

This section proposes to require ICT with two-way voice communication to transmit and receive digitally encoded speech in the manner specified by ITU-T Recommendation G.722, a consensus standard for encoding and storing digital audio information that is incorporated by reference in 508 Chapter 1 and 255 Chapter 1. An exception for closed systems would exempt such systems from conformance to ITU-T Recommendation G.722 provided that they conform to another standard that ensures equivalent or better acoustic performance and support conversion to ITU-T Recommendation G.722 at their borders. This provision was recommended by the Advisory Committee to help improve auditory clarity for persons with hearing impairments. It is new to both the 508 Standards and 255 Guidelines.

410.6 Real-Time Text Functionality

This proposed section establishes requirements for RTT functionality for ICT that provides real-time voice communication. As noted previously, both the Advisory Committee and the Board believe that RTT represents an important technological advance that provides an equivalent alternative to voice communications for persons who are deaf, as well as those with limited hearing or speech impairments. RTT

delivers a more interactive, conversational communication experience compared to standard text messaging. It also provides superior speed and reliability in emergency situations. Furthermore, RTT permits the user to communicate using mainstream devices—such as mobile phones—rather than having to use specialized and expensive devices (such as TTYs). See discussion above in Section IV.E.4 (Rulemaking History – 2010 and 2011 ANPRMs: Significant Issues – Coverage of Real-Time Text), and Section V.D (Major Issues – Real-Time Text).

Proposed 410.6 would require that, where ICT supports real-time voice communication, it must also support RTT functionality. Subsections of this proposed provision would, in turn, establish technical requirements for display, text generation, and interoperability. Importantly, proposed 410.6 would not mandate that all ICT provide RTT functionality. Rather, only those ICT that already have real-time voice communication capabilities would be required to support RTT functions. In this way, the Board's approach to requirements for RTT in the proposed rule mirrors the approach taken in the existing 508 Standards and 255 Guidelines toward TTY compatibility. Neither the existing standards and guidelines nor the proposed rule establish an across-the-board command that telecommunications equipment or devices "build in" text capability. Instead, both sets of rules simply require that, when such equipment or devices offer voice communication functions, they must also ensure compatibility with certain types of text communication (i.e., TTY and RTT) by supporting use of specified cross-manufacturer, non-proprietary signals. See 36 CFR 1193.51((e), 1194.23(b).

410.6.1 Display of Real-Time Text

This proposed section is new to the 508 Standards and 255 Guidelines and would require that, wherever ICT provides real-time voice communication and includes a multi-line screen, the ICT must also support the display of real-time text. This provision would not apply to telecommunications devices that either do not have display screens, or only have display screens capable of showing one line of text at a time.

410.6.2 Text Generation

This proposed section is new to the 508 Standards and 255 Guidelines and would require that, wherever ICT provides real-time voice communication and includes a keyboard, the ICT must also support the generation of real-time text.

410.6.3 Interoperability

This section proposes that, where ICT with real-time two-way voice communication operates outside of a closed network or connects to another system, such ICT must ensure real-time text interoperability by using one of two cross-manufacturer, non-proprietary consensus standards depending on the nature of the system with which it is exchanging information—namely, a traditional telephone network or Internet-based telephony.

410.6.3.1 PSTN

This section proposes that, where ICT with real-time two-way voice communication interoperates with the publicly switched telephone network (PSTN), real-time text conform to TIA 825-A (incorporated by reference in 508 Chapter 1 and 255 Chapter 1). This is the current industry standard for TTY signals (also known as Baudot) at the PSTN interface.

410.6.3.2 VoIP Using SIP

This section proposes that, where ICT with real-time two-way voice communication interoperates with “Voice over Internet Protocol” (VoIP) products or systems that use Session Initiated Protocol (SIP), real-time text conform to RFC 4103 (incorporated by reference in 508 Chapter 1 and 255 Chapter 1). In Question 8 above, see Section V.D., the Board seeks comment regarding the potential benefits, costs, and drawbacks associated with referencing other standards in addition to RFC 4103.

410.6.4 Voice Mail, Auto-Attendant, and IVR Compatibility

This section proposes that, where ICT provides real-time two-way voice communication, any associated voice mail, auto-attendant, and interactive voice response systems must be compatible with real-time text functionality. This section derives from existing 508 Standards §§ 1194.23(c)-(e), as well as existing 255 Guidelines §§ 1193.51(d)-(e).

410.6.5 HCO and VCO Support

This section proposes that, where ICT provides real-time two-way voice communication, it must permit users to intermix speech with the use of real-time text. Such ICT would also be required to support modes that are compatible with Hearing Carry Over (HCO) and Voice Carry Over (VCO). This provision is collectively derived from existing 508 Standards § 1194.23(a) and 255 Guidelines § 1193.51(d), and is consistent with changes in technology over time from TTYs to real-time text functionality. It is particularly significant in preserving the use of HCO/VCO with evolving technology.

410.7 Caller ID

This section proposes that, where ICT provides two-way voice communication, any associated caller identification or similar telecommunications functions must be presented in both visual (e.g., text) and auditory formats. This requirement would be new to the 255 Guidelines, but corresponds to a similar requirement in § 1194.23(e) of the existing 508 Standards. This proposed requirement could be met, for example, by having the system provide Caller ID in an auditory format, or by ensuring that Caller ID is available to assistive technology. Presentation of Caller ID in both visible and auditory forms ensures that individuals with visual impairments, hearing loss, or both, could use Caller ID and similar services, when provided.

410.8 Video Communication

This section proposes that ICT with real-time video functionality must ensure that the quality of the video is sufficient to support communication through sign language. This proposed section would be new to both the 508 Standards and 255 Guidelines. The Advisory Committee recommended that the Board include a provision requiring ICT used to transmit video communications in real-time to meet certain specifications for video quality and fluidity (i.e., speed, data stream, and latency). See TEITAC Report, Part 6. Subpt. C, Rec. 6-E.

The Board's proposals relating to the requisite quality of real-time video communications have received mixed reviews from commenters. In the 2010 ANPRM, the Board proposed specifications for the quality of real-time video communication that largely mirrored the Advisory Committee's recommendation. Many commenters expressed support for the general concept of a video quality requirement as important for ensuring the accessibility of a means of communication, which, for persons who are deaf or hard of hearing, is the functional equivalent of voice communication. Some commenters, on the other hand, were critical of the Board's proposed technical specifications as overly prescriptive or unsupported by research. In light of such concerns, in the 2011 ANPRM, the Board simply proposed—as here in this proposed rule—that the quality of video must be sufficient to support sign language communication. Commenters to the 2011 ANPRM, while again generally supportive of the effort to ensure real-time video communications were usable by persons with hearing impairments, largely took issue with the proposal's lack of testable measures.

While the Board is mindful of commenters' criticisms to the 2011 ANPRM's performance-based standard for video quality of real-time video functionality, the Board has nonetheless retained this standard in this proposed rule. This provision would cover video communication via the web on dedicated videophones, as well as commonly used ICT such as smartphones. We are not aware of standards or specifications for video quality that would provide testable and achievable metrics to assess the quality and transmission of real-time video communications. However, technologies—as well as standards development—have progressed greatly in recent years. We welcome public comment on technological improvements or useful metrics relating to real-time video communication developed since the 2011 ANPRM.

Question 27. Does the performance-based standard in proposed 410.8 ensure that video quality would be sufficient to support a real-time video conversation in which one or more parties use sign language? If not, are there standards for video quality or transmission that would better implement the accessibility goal of this proposed requirement? Would it be readily achievable for manufacturers of telecommunications equipment to comply with section 410.8?

411 Closed Caption Processing Technologies

This is an introductory section.

411.1 General

This section addresses the accessibility of audio-visual technologies—including analog and digital televisions, tuners, personal video display devices, converter boxes, and computer equipment—by requiring such technologies to support closed and open captions. Captioning is critical for persons with hearing impairments to use and understand information presented in a video format. Specifically, proposed 411.1 provides that, where audio-visual players and displays process video with synchronized audio, they must either decode closed caption data and display open captions, or pass-through the closed captioning data stream in an accessible format. This proposal largely corresponds to existing 508 Standards §§ 1194.23(j) and 1194.24(a), and existing 255 Guidelines § 1193.37, though it differs in a few notable respects. Due to advances in technology, this proposed section neither distinguishes between analog and digital televisions, nor conditions the requirement for closed caption decoder circuitry on screen size. Additionally, the proposal substitutes the term “synchronized audio information” for “multimedia” because it is more precise and consistent with current terminology.

Question 28. Would compliance with section 411 be readily achievable for manufacturers of mobile telecommunications equipment?

411.1.1 Decoding of Closed Captions

This section proposes that, where audio-visual players and displays process video with synchronized audio, they must decode closed caption data and support display of open captions.

411.1.2 Pass-Through of Closed Caption Data

This section proposes that, where audio-visual players and displays process video with synchronized audio, cabling and ancillary equipment would be required to pass through caption data. High-definition multimedia cables (HDMI) carry audio and video signals, and are technically capable of passing through caption data; typically, however, caption data is not included with the audio-visual stream.

412 Audio Description Processing Technology

This is an introductory section.

412.1 General

This proposed section would require that, where ICT displays or processes video with synchronized audio, ICT must provide a mode of operation that plays associated audio description. This requirement draws from the audio description requirement in existing 508 Standards § 1194.24(b), but would include a specification for digital television tuners. This would be a new requirement to the 255 Guidelines.

Question 29. Would compliance with section 412 be readily achievable for manufacturers of mobile telecommunications equipment?

412.1.1 Digital Television Tuners

This section proposes that, where audio description is played through a digital television tuner, that such tuner conform to Part 5 of the ATSC A/53 Digital Television Standard (incorporated by reference in 508 Chapter 1 and 255 Chapter 1). The provision then goes on to require that tuners provide processing for audio description when encoded as a Visually Impaired (VI) associated audio service. This is the industry-wide accepted method for delivery of audio description content and the means to identify audio as a VI associated audio service.

413 User Controls for Captions and Audio Description

This is an introductory section.

413.1 General

This proposed section addresses the accessibility of controls for captioning and audio description on devices used to watch video programming, including analog and digital televisions, tuners, personal video display devices, converter boxes, and computer equipment. Specifically, this provision would require hardware displaying video with synchronized audio to locate user controls for closed captions and audio description in specified locations of equal prominence to common user controls (i.e., volume and program selection), as set forth in two accompanying subsections (proposed 413.1.1 and 413.1.2). An exception would be provided for devices for personal use when closed captions and audio description can be enabled through system-wide platform settings. This exception is proposed in recognition of the fact that the small size of most mobile devices would make compliance particularly challenging.

The requirements in proposed 413.1 would be new to the 508 Standards and the 255 Guidelines. The Advisory Committee recommended inclusion of this provision to ensure that persons with hearing- and vision-related disabilities can find—and use—captioning and audio description controls. See TEITAC Report, Part 6, Subpt. C, Rec. 4-C. (Complimentary provisions governing software-based on-screen controls for captions and audio description are addressed in proposed 503.4.)

This proposed requirement, albeit with slightly different wording, was included in the 2010 and 2011 ANPRMs. Comments from organizations representing persons with disabilities lauded this proposed requirement as a significant step toward improving the accessibility of captioning and audio description controls. These organizations characterized consumers with disabilities as having long struggled with varying methods among manufacturers for accessing such controls, describing them as typically more complex and less “user friendly” compared to the control of other core functions. They also noted that difficulties locating and using caption and audio description controls is of particular concern for persons with disabilities when in unfamiliar locations (e.g.,

television in hotel room), or an emergency situation when accessing captioned or audio described information could be life-saving.

Commenters with connections to the ICT industry, on the other hand, expressed concern with the broad scope of the proposed provision. These commenters noted that the proposed requirement governing location of controls for captions and audio description would apply not only to televisions and remote controls, but also a wide range of “general purpose” devices—such as desktop computers, laptops, and other mobile devices—for which multimedia output is an incidental function. They suggested that either the scoping of the requirement be modified, or “general purpose” devices be exempted from providing physical buttons for closed captions and audio description. Others simply noted more generally that providing caption controls with equal prominence to volume controls could be problematic for some types of hardware-based ICT.

In late 2013, the FCC issued a final rule addressing, among other things, the accessibility of user interfaces on digital devices and software used to view video programming, including closed captioning and audio description (which, in the Commission’s rule, is referred to as “video description”).¹¹ To implement the Twenty-First Century Communications and Video Accessibility Act of 2010 (CVAA), Public Law No. 111-260 (2010) (codified in scattered sections of 47 U.S.C.), the FCC, in pertinent part, promulgated rules requiring “digital apparatus” designed to receive or play back video programming to provide access to closed captioning and video description through a mechanism that is reasonably comparable to a button, key or icon.¹² “Navigation devices”—which include digital cable ready televisions, set-top boxes, computers with CableCARD slots, and cable modems—are required to provide similar access to closed captioning (but not, at this juncture, video description) for on-screen menus and guides. The Commission declined, however, to adopt technical standards, performance objectives, or other specific metrics to evaluate accessibility. Establishment of such standards, the Commission determined, was beyond its statutory authority, and would, in any event, potentially stifle innovative approaches.

Proposed 413.1, in the Board’s view, complements the approach taken by the FCC in its final rule on accessibility of user interfaces. As with the FCC’s rule, the Board proposes to require that ICT with the capability of displaying video with synchronized

¹¹ See Accessibility of User Interfaces, and Programming Guides, 78 FR 77210 (Dec. 20, 2013); Report and Order and Further Notice of Proposed Rulemaking, MB Docket No. 12-108, 28 FCC Rcd. 17330 (Oct. 31, 2013) (to be codified at 47 CFR pt. 79) (hereafter, FCC User Interface Accessibility Order).

¹² “Digital apparatus,” as defined by the FCC, encompasses devices or software designed to receive or play back video programming that does not have built-in capacity to access cable programming or services. This term includes: televisions and computers that are not designed to be cable ready; removable media players; mobile devices (such as tablets and smartphones) without pre-installed applications to access cable; and, “video players and user interfaces of video applications, such as Netflix, Hulu, and Amazon, when such applications are pre-installed . . . by the manufacturer.” FCC User Interface Accessibility Order at ¶¶ 2, 39.

audio ensure that controls for closed captions and audio description are accessible to persons with disabilities. Unlike the FCC, however, the Board does propose technical standards—namely, placement of caption and audio description controls—that govern how accessibility must be achieved. This is consistent with the Board’s statutory mandate under both the Rehabilitation Act and Communications Act. See 29 U.S.C. §§ 794d (2) (A) (ii), 794d (B); 47 U.S.C. 255(e). Thus, while the FCC may have been statutorily constrained by the CVAA with respect to technical standards for user interfaces, the Board is not. Indeed, one of Board’s core missions is the establishment of technical standards. In this way, proposed 413.1 may be seen as complimenting the FCC’s recent final rule. Both agencies establish an accessibility mandate for user interfaces on certain ICT that displays video with synchronized audio, but the Board, in this proposed rule, goes one step further by establishing a metric to assess accessibility—namely, placement of user controls for closed captions and audio description in locations of equal prominence to other core functions (i.e., volume control and program selection).

Question 30. Does proposed 413.1 strike an appropriate balance between ensuring users with hearing or vision impairments can readily find and use controls for closed captioning and audio description, while also affording device manufacturers sufficient design flexibility? Should the requirement for a captioning button be limited to devices that have both up/down volume controls and a mute button? Or, more generally, should the provision of caption controls be limited to certain types of hardware?

413.1.1 Caption Controls

This proposed section would require that, where video-capable hardware provides physical volume adjustment controls, such ICT must also have a control for closed captioning in at least one location of comparable prominence to the volume adjustment controls. So, for example, if a television had physical volume controls on the display panel, as well as its accompanying remote control, this proposed requirement would be satisfied so long as a user control for captions was located either, at the manufacturer’s discretion, on the display or remote control in an equally prominent location to the volume control. (If this television also had a feature to adjust volume by way of an on-screen tool or menu, caption control requirements for this on-screen control would be governed by the software-based requirements in proposed 503.4.)

Question 31. While the Board believes that proposed 413.1.1 would greatly benefit persons who are deaf or hard of hearing, we did not monetize the benefits or costs of providing caption controls on covered hardware. The Board seeks data and other information from the public in order to estimate the monetized costs and benefits of this proposal. For commenters who do not view this proposed requirement as beneficial, how should the accessibility barriers faced by individuals with hearing impairments who seek to locate and operate closed caption features be addressed? Commenters should provide concrete suggestions for improving proposed 413.1.1.

413.1.2 Audio Description Controls

This proposed section would require that, where video-capable hardware provides controls for program selection, such ICT must have user controls for audio description in at least one location of comparable prominence to the program selection controls. This requirement would be new to the 508 Standards. Locating audio description controls in a prominent location is not currently a common design practice, though the Board does not anticipate that it will add substantial cost. In practice, this would require one extra button on a remote control. While not as common as products featuring controls for captioning, there are already products commercially available that feature user controls for audio description.

Question 32. While the Board believes that proposed 413.1.2 would greatly benefit consumers who are blind or have low vision, we did not monetize the benefits or costs of providing audio description controls on covered hardware. The Board seeks data and other information in order to estimate the monetized costs and benefits of this proposal. For commenters who do not view this proposed requirement as beneficial, how should the accessibility barriers faced by individuals with vision impairments who seek to locate and operate audio description features be addressed? Commenters should provide concrete suggestions for improving proposed 413.1.2.

Chapter 5: Software

Chapter 5 contains proposed technical requirements for software, applications, platforms, and software tools. The requirements in this chapter, along with the scoping provisions in proposed E207 and C205, collectively form the “suite” of accessibility requirements for these types of ICT. This chapter is largely drawn from existing 508 Standards § 1194.21, but with updating to harmonize with WCAG 2.0.

501 General

This is an introductory section.

501.1 Scope

This section proposes that the technical requirements for software in this chapter be applied where either (a) required by 508 Chapter 2 or 255 Chapter 2, or (b) where otherwise referenced in any other chapters. There are two exceptions. Exception 1, as proposed, provides that Web applications conforming to all Level A and AA Success Criteria and all Conformance Requirements in WCAG 2.0 need not conform to proposed 502 (Interoperability with Assistive Technology) or 503 (Applications). This exception is provided because software that conforms to WCAG 2.0 AA is already accessible. The value of promoting a single harmonized standard outweighs any small benefit that might be achieved by conforming to overlapping, but separate, standards.

Exception 2 proposes that software that (1) is assistive technology and (2) supports the accessibility services of the platform for which it is designed need not conform with the provisions of this chapter. This exception is included because assistive technology frequently needs flexibility in order to perform well for end-users with disabilities. For

example, a switch-activated on-screen keyboard might not have a mode that makes it usable by someone who is blind. This exception is also deliberately limited to software that follows platform specifications because it is important that assistive technology be compatible with other assistive technology.

502 Interoperability with Assistive Technology

This is an introductory section.

502.1 General

This section proposes that platforms, software tools provided by platform developers, and applications must conform to the requirements in the accompanying subsections related to documented accessibility features (502.2), accessibility services (502.3), and platform accessibility services (502.4). An exception is provided for platforms and applications that have closed functionality.

This section has implications for both platform developers and federal procurement officials. Agencies would have to ensure that all operating systems they purchase have an associated set of documented accessibility services. Software developers would have to provide accessibility services when creating platforms and their software tools.

502.2 Documented Accessibility Features

This section addresses the compatibility of software and assistive technology. Specifically, under proposed 502.2, platform features that are defined in the platform documentation as accessibility features would be required to conform to requirements in accompanying subsections related to user control (502.2.1) and non-disruption (502.2.2) of accessibility features.

502.2.1 User Control of Accessibility Features

This section proposes that platforms must provide user control over platform features when such features are defined in platform documentation as serving an accessibility purpose. This provision would be new to the 508 Standards and 255 Guidelines, though it draws on the prohibition in § 1194.21(b) of the existing 508 Standards against disrupting or disabling accessibility features. The Advisory Committee recommended that the Board include an express provision ensuring that persons with disabilities are able to activate and use features or settings—such as font size, or color—that preclude network or system-wide configurations from “locking down” needed accessibility features. See TEITAC Report, Part 6, Subpt. C, Rec. 2-C. This proposal was included in the 2010 and 2011 ANPRMs, and the only comments received related to minor editorial changes.

502.2.2 No Disruption of Accessibility Features

This section proposes that, where accessibility features are defined in platform documentation, applications must not disrupt them. This provision mirrors existing 508

Standards § 1194.21(b). The Advisory Committee strongly recommended that the Board include this requirement in the proposed rule not only to ensure accessibility, but also to avoid platform developers from being responsible for incompatibilities that derived from undocumented platform services or hidden requirements of assistive technology. See TEITAC Report, Part 6, Subpt. C, Rec. 3-Q. This proposal was included in the 2010 and 2011 ANPRMs and received no adverse comments.

502.3 Accessibility Services

This section proposes that platforms (such as operating systems) and software tools provided by the platform developer furnish a documented set of accessibility services—usually referred to as Application Programming Interfaces (APIs)—in order to enable applications running on the platform to interoperate with assistive technology. Additionally, applications that are themselves platforms would be required to expose underlying platform accessibility services or implement other document accessibility services.

This proposal does not have an analog in the existing 508 Standards because, at the time the standards were issued in 2000, mainstream operating systems had a well-established track record of providing APIs. Since then, some platforms, particularly those used by first generation mobile devices, stopped providing these requisite components of baseline accessibility. This proposed provision would not represent a significant change from widespread industry practice, since all major platforms have well-developed APIs that incorporate accessibility. Consequently, it is important to expressly require APIs. A documented set of accessibility services is important to end-users because, without them, developers are likely to provide inconsistent access to assistive technology, thereby leaving end-users with disabilities without access to needed features. Well-documented accessibility services are especially important for developers new to accessibility, and can serve to alert all developers to the importance of the accessibility features of platforms.

502.3.1 Object Information

This section proposes that particular programming elements—namely object role, state, boundary, name, and description—must be programmatically determinable. Moreover, user-adjustable states would be required to be set programmatically, including through assistive technology. This proposal, along with proposed 502.3.3, corresponds to WCAG 2.0 Success Criteria 4.1.2 Name, Role, and Value. It is also consistent with existing 508 Standards § 1194.21(d), but more explicitly provides for the user to be able to change data values, not just read them. Making the specified states programmatically determinable is already a widespread industry practice and is a standard feature provided in software designed to be accessible. Nonetheless, it is important to address this issue in the proposed rule because, on occasion, users of assistive technology find that they can read data in fields, but cannot make changes.

502.3.2 Row, Column, and Headers

This section proposes that, where a programming object is in a table, occupied rows and columns (i.e., those populated with data), as well as any headers associated with such rows or columns, must be programmatically determinable. This provision corresponds to §§ 1194.22(g) and 1194.22(h) of the existing 508 Standards. A similar requirement is set forth in WCAG 2.0 Success Criteria 1.3.1 Info and Relationships. See W3C, Understanding SC 1.3.1, Understanding WCAG 2.0 (Sept. 16, 2014), <http://www.w3.org/TR/UNDERSTANDING-WCAG20/content-structure-separation-programmatic.html>.

502.3.3 Values

This section proposes that current values, as well as any set or range of allowable values associated with a programming object, must be programmatically determinable. This proposal would also require values that can be set by the user to be capable of being set programmatically, including through assistive technology. This proposal, along with proposed 502.3.1, corresponds to WCAG 2.0 Success Criteria 4.1.2 Name, Role, and Value. An express requirement for values to be set programmatically would be new to the 508 Standards. However, existing industry practice in response to existing standards (i.e., 508 Standards § 1194.21(d)) is to permit values to be set programmatically.

502.3.4 Label Relationships

This section proposes that relationships between components must be programmatically exposed to assistive technology where a component labels, or is labeled by, another component. This provision corresponds to §§ 1194.21(l) and 1194.22(n) in the existing 508 Standards, though it is broader in scope since, unlike these current requirements, its coverage extends beyond forms. A similar requirement is set forth in WCAG 2.0 Success Criteria 1.3.1 Info and Relationships. See W3C, Understanding SC 1.3.1, Understanding WCAG 2.0 (Sept. 16, 2014), <http://www.w3.org/TR/UNDERSTANDING-WCAG20/content-structure-separation-programmatic.html>.

502.3.5 Hierarchical Relationships

This section proposes that any hierarchical (parent-child) relationship between components be programmatically exposed to assistive technology. This is important for individuals who use assistive technology so they can understand the relationships or interdependencies between menu options, database entries, or other software elements that have parent-child relationships. For example, word processing and email software commonly use one or more sub-menus that cascade from a “main” menu item, which permit the user to perform desired actions such as saving a file in a specific format or altering font styles. Requiring components to expose (i.e., provide) hierarchical relationships to assistive technology ensures that an individual using a screen reader, for example, could understand these relationships and, thereby, perform the desired

function or action. This provision corresponds to existing 508 Standards §§ 1194.21(l) and 1194.22(n). In addition, in response to existing 508 Standards § 1194.21(d), current industry practice is to ensure that any parent-child relationship that components have to other components is programmatically exposed to assistive technology. This requirement closely parallels Success Criterion 1.3.1 in WCAG 2.0, but has greater specificity because software is more structured than Web content.

502.3.6 Text

This section proposes that the content of text objects, text attributes, and on-screen text boundaries be programmatically determinable. Additionally, text that can be set by the user would have to be capable of being set programmatically, including through assistive technology. This provision would be useful for a screen-reader user, for example, when filling in a field on a form. It would be quite frustrating to be able to navigate to a form field, and perhaps even read placeholder text in that field, but then not be able to enter text as needed. This provision corresponds to § 1194.21(f) in the existing 508 Standards.

502.3.7 Actions

This section proposes that a list of all actions that can be executed on an object must be programmatically determinable. An example of an “object” is a drop-down menu of states and U.S. territories in an online form. Applications would also be required to allow assistive technology to programmatically execute available actions on objects. While this requirement is new to the 508 Standards, it represents widespread industry practice. It is also already a feature provided by software designed to be accessible. This proposed requirement is important because, on occasion, developers new to accessibility overlook this need.

502.3.8 Focus Cursor

This section proposes that software be required to expose information and mechanisms necessary to programmatically track and modify keyboard focus, text insertion point, and selection attributes of user interface components. An example of “focus cursor” is a database, which, as the user hits the tab key, displays a visible box outlining the various fields. This provision corresponds to § 1194.21(c) in the existing 508 Standards.

502.3.9 Event Notification

This section proposes that programmatic notification of events relevant to user interactions—including changes in a component’s state, value, name, description, or boundary—must be available to assistive technologies. This proposal complements existing 508 Standards § 1194.21(d), but more explicitly requires that changes to on-screen user interfaces be done in a way that such changes, otherwise known as events, are exposed to assistive technology. Such event notification is already a widespread industry practice, and, moreover, a feature provided by software designed to be

accessible. This proposed requirement is important to address this issue in these proposed requirements because, on occasion, developers new to accessibility overlook this need.

502.4 Platform Accessibility Features

This section addresses specifications for capabilities that users with disabilities have come to expect as core accessibility features when using today's platforms and operating systems, such as allowing adjustment of delay before key acceptance and displaying provided captions. These features include: sticky keys; bounce keys; delay keys; show sounds; the ability to produce synthesized speech; and, the capability to display captions included in content. Specifically, this proposal would require platforms and platform software to conform to seven specific sections in ANSI/HFES 200.2, Human Factors Engineering of Software User Interfaces (incorporated by reference in 508 Chapter 1 and 255 Chapter 1). While this proposed requirement (and accompanying incorporation by reference of ANSI/HFES 200.2) is new to the 508 Standards and 255 Guidelines, it does not represent a material change from current industry practice. The seven enumerated features were first available as an add-on for the IBM DOS 3.3 operating system (which was publicly released in the mid-1980s), and have been incorporated into every release of the Microsoft Windows® operating system since then.

Question 33. The Board is requesting information from covered entities and other stakeholders on the potential costs or benefits from incorporation of ANSI/HFES 200.2, Human Factors Engineering of Software User Interfaces —Part 2: Accessibility (2008). Are there suggestions for other standards that would result in the same level of accessibility?

503 Applications

This is an introductory section.

503.1 General

This section addresses specifications for non-Web software—that is, programs with a user interface that are executed on a computing platform—related to certain user preferences, interfaces, and controls. The proposed requirements in this section are separate from, and in addition to, any required conformance to WCAG 2.0 success criteria that may be otherwise required under the proposed 508 Standards (under E207) or the 255 Guidelines (under C205).

503.2 User Preferences

This section proposes that applications must permit user preferences to carry over from platform settings for text color, contrast, font type, font size, and focus cursor. This closely corresponds to § 1194.21(g) in the existing 508 Standards.

An exception is provided that would exempt software designed to be isolated from the underlying operating system. Lightweight applications (often called “applets”) using the Adobe® Flash® Platform, Oracle® Java Platform, W3C HTML 5 platform, and similar technologies, are commonly isolated in this way for security reasons. Accordingly, it would be a fundamental alteration to require such applications to carry over platform settings.

503.3 Alternative User Interfaces

This section proposes to require that, when applications provide alternative user interfaces that function as assistive technology, such applications must use platform accessibility services (i.e., APIs). Examples of alternative user interfaces include on-screen keyboards for a single switch user, and screen reading software for a person who is blind. This proposed requirement would be new to the 508 Standards and 255 Guidelines. It is included in this proposed rule to address the accessibility gap that would occur should developers of novel interfaces not consider their products to be assistive technology and, consequently, conclude they may ignore the requirements for interoperability with assistive technology (proposed 502). By clarifying that alternative user interfaces functioning as assistive technology need to satisfy interoperability requirements, the section aims to forestall the rare, but problematic, situation where there is a question about whether a product should be treated as assistive technology or another type of software.

503.4 User Controls for Captions and Audio Description

This proposed section addresses the accessibility of on-screen controls for captioning and audio description. Specifically, this provision would require software displaying video with synchronized audio to locate user controls for closed captions and audio description at the same menu level as common user controls (i.e., volume, program selection), as set forth in two accompanying subsections (proposed 503.4.1 and 503.4.2).

These proposed requirements for accessibility of software-based on-screen controls for captions and audio description serve as a complement to the near-identical requirements for hardware-related controls in Chapter 4. See discussion above in Section VI.C (Section-by-Section Analysis – section 413 User Controls for Captions and Audio Description). These proposed requirements would be new to the 508 Standards and 255 Guidelines. The Advisory Committee recommended inclusion of these provisions to ensure that persons with hearing- and vision-related disabilities can find—and use—captioning and audio description controls. See TEITAC Report, Rec. 4-C.

503.4.1 Caption Controls

This proposed section would require that, where video-capable software provides on-screen volume adjustment controls, such ICT must also have a control for closed captioning at the same menu level as the volume adjustment controls.

503.4.2 Audio Description Controls

This proposed section would require that, where video-capable software provides on-screen controls for program selection, such software must have user controls for audio description at the same menu level as the volume or program selection controls.

504 Authoring Tools

This is an introductory section.

504.1 General

This section proposes requirements for software used to create or edit electronic content—which is generally referred to as authoring tools—to ensure the accessibility of this content. Specifically, authoring tools would be required to conform to accessibility requirements related to content creation and editing (504.2), prompts (504.3), and templates (504.4) to the extent supported by the destination format. Authoring tools include applications that allow users to develop new Web pages, edit video, or create electronic documents. Authoring tools can also be used to create and publish content for use with telecommunications products or services. One example of a telecommunications equipment-based authoring tool is an interactive voice response system (IVR) that uses software capable of creating content used to populate menu choices.

These proposed requirements for authoring tools are new to the 508 Standards and 255 Guidelines. The Advisory Committee discussed authoring tools and offered recommendations on certain provisions, but did not achieve consensus on others. See TEITAC Report, Part 7, Subpt. C, Rec. 7. Industry is already trending toward providing mainstream document creation tools that facilitate accessible output. For example, two mainstream authoring tools that support accessible document creation and accessibility checking tools are Adobe Acrobat® XI Pro and Microsoft® Office software products. Any cost increases for this requirement should be quite modest for products that already support accessibility. It is not uncommon for developers of niche products to first learn about Section 508 because their product exports reports to PDF, and government customers are likely to encounter end-user complaints when such reports are inaccessible. In this way, while a particular authoring tool may be used only by a small number of people, its outputs—such as government reports—may be widely distributed to the public.

Benefits of accessible content created or edited with authoring tools conforming to proposed 504.1 would accrue to a wide range of disabilities, and the costs associated with making such tools capable of producing accessible output are likely to be minimal. Developers already understand how to make electronic documents accessible in commonly used formats (i.e., HTML, PDF, MS-Word), and it is typically much less expensive to “build in” accessibility when an authoring tool is first developed as opposed to remediating after a product has been developed.

504.2 Content Creation or Editing

This section proposes to require authoring tools to include at least one mode of operation for creating or editing content that conforms to WCAG 2.0 Success Criteria for all features and formats supported by the authoring tool. Additionally, authoring tools must provide users with the option of overriding information required for accessibility to provide flexibility during the authoring process. A proposed exception would exempt authoring tools from compliance when authoring tools are used to directly edit plain text source code (e.g., Emacs and Windows Notepad). This exception is needed because plain text is fundamentally limited in its ability to encode accessibility features.

504.2.1 Preservation of Accessibility Information in Format Conversion

This section proposes that authoring tools, when converting content or saving content in multiple formats, must preserve information required for accessibility to the extent supported by the destination format. This proposed requirement is similar to § 1194.23(j) in the existing 508 Standards. Because not all authoring tools support different file formats, this provision would only apply when such a tool provides a file conversion feature.

504.3 Prompts

This proposed section would require authoring tools to proactively support the creation of accessible content by providing a mode of operation that prompts users—either during initial content creation or when content is saved—to create accessible content that conforms to all applicable Level A and AA Success Criteria in WCAG 2.0. This requirement is intended to ensure that users have access to accessibility features supported by their authoring tools.

504.4 Templates

This proposed section would require that, where authoring tools provide templates, templates that facilitate the creation of accessible content conforming to all applicable WCAG 2.0 Level A and Level AA Success Criteria must be provided for a range of template uses. It is much easier to start with an accessible template as compared to adding accessibility features to otherwise finished content. Remediating accessibility problems after content development increases the cost and time necessary to produce accessible content.

Chapter 6: Support Documentation and Services

Chapter 6 covers accessibility requirements for ICT support documentation and services. This section also would require support services such as help desks, call centers, training services, and automated self-service technical support systems that provide documentation to make available (in accessible formats) the documentation regarding accessibility and compatibility features. Support services would also be required to accommodate the communication needs of individuals with disabilities.

The proposed requirements in this chapter are largely consistent with existing 508 Standards § 1194.41 and existing 255 Guidelines § 1193.33, but would enhance specifications, as discussed below, for certain types of support documentation and services. The Advisory Committee recommended inclusion of provisions on support documentation and services in the proposed rule. See TEITAC Report, Part 6, Subpt. D, Rec. 1.

601 General

This is an introductory section.

601.1 Scope

This section proposes that the technical requirements for support documentation and services in this chapter be applied where either (a) required by 508 Chapter 2 or 255 Chapter 2, or (b) where otherwise referenced in any other chapters.

602 Support Documentation

This is an introductory section.

602.1 General

This section proposes to require documentation supporting the use of ICT to conform to the requirements in the accompanying subsections concerning identification of accessibility and compatibility features (602.2), electronic support documentation (602.3), and alternate formats for non-electronic support documentation (602.4). These proposals for accessible support documentation are derived from §§ 1194.41 and 1193.33 of the existing 508 Standards and 255 Guidelines respectively, but the requirement that electronic documentation comply with WCAG 2.0 or PDF/UA-1 would be new to both the standards and the guidelines. Requiring that comprehensive product information be available to users with disabilities is important because product installation and configuration can often impact its accessibility.

602.2 Accessibility and Compatibility Features

This section provides specifications for ICT documentation in terms of accessibility and compatibility features that assist users with disabilities. Such documentation includes installation guides, user guides, online support, and manuals that describe features of a product and how it is used. All formats of documentation are covered, including printed and electronic documents, and Web-based product support pages.

Proposed 602.2 would require documentation to identify, as well as explain how to use, accessibility features that are required by the 508 Standards or 255 Guidelines. The requirements of this section derive from §§ 1194.41(b) and 1193.33 of the existing 508 Standards and 255 Guidelines, respectively, and are essentially unchanged.

This provision is proposed because some users with disabilities have complained about a lack of information available to help them understand the accessibility and compatibility features of some ICT. Documentation of accessibility features may include, for example, instructions on use of the voice guidance system of a multifunction office machine, or guidance on using software designed for compatibility with commonly used assistive technologies (such as screen readers, refreshable braille displays, and voice recognition software).

602.3 Electronic Support Documentation

This section proposes to require documentation in electronic formats—including Web-based self-service support and electronic documents—to conform to all Level A and AA Success Criteria and Conformance Requirements in WCAG 2.0 or ISO 14289-1 (PDF/UA-1), which are each incorporated by reference in 508 Chapter 1 and 255 Chapter 1. This proposal for accessible electronic support documentation is derived from §§ 1194.41 and 1193.33 of the existing 508 Standards and 255 Guidelines respectively, but the requirement that electronic documentation comply with WCAG 2.0 or PDF/UA-1 would be new to both the standards and the guidelines. The purpose of this requirement is to ensure that support documentation is held to the same accessibility requirements as other types of covered content. The Board included similar provisions in the 2010 and 2011 ANPRMs, and received no adverse comments objecting to this approach.

Question 34. The Board requests that telecommunications equipment manufacturers provide information on the costs associated with producing documentation on the accessible features of products in a format consistent with the WCAG 2.0 Success Criteria. Is it readily achievable to provide this information in an accessible format? If not, how would it be provided?

602.4 Alternate Formats for Non-Electronic Support Documentation

This section proposes that, where documentation is provided in written (i.e., hard copy) format, such documentation must also be made available, upon request, in alternate formats usable by individuals who are blind or have low vision. This proposed requirement is taken from §§ 1194.41(a) and 1193.33(a)(2) of the existing 508 Standards and 255 Guidelines, respectively, with minor editorial changes.

603 Support Services

This is an introductory section.

603.1 General

This section addresses the accessibility of ICT support services, such as help desks, call centers, training centers, and automated self-service technical support. Such support services would be required to conform to the requirements concerning information on accessibility and compatibility features (603.2), as well as accommodation for the communication needs of persons with disabilities (603.3).

These proposed requirements for accessible support services are drawn from §§ 1194.41 and 1193.93 of the existing 508 Standards and 255 Guidelines respectively, but have been revised—as supported by the Advisory Committee—to specify methods of delivery for support services. See TEITAC Report, Pt. 6, Subpt. D, Recs. 1.1-A & 1.2-A.

603.2 Information on Accessibility and Compatibility Features

This proposed section complements the product documentation requirements in section 602 by proposing that ICT support services include information on the accessibility and compatibility features for which documentation is required under proposed 602.2.

603.3 Accommodation of Communication Needs

This proposed section would permit compliant support services to be delivered through either of two methods: directly to the user or through referral to a point of contact. This section also would require ICT support services to accommodate the communication needs of individuals with disabilities. The portion of this proposal relating to two specific methods for delivery of support services is based on existing 255 Guidelines §§ 1193.33(a)(3) and 1193.33(b), and would be new to the 508 Standards. The portion of the proposal relating to accommodation of communication needs derives from §§ 1194.41(c) and 1193.33 of the 508 Standards and 255 Guidelines, respectively.

VII. Effective Date

The Board is considering making the 508 Standards effective six months after publication of the final rule in the Federal Register, with one exception: federal procurement of ICT products or services. A six-month delay in the effective date of the Access Board's final rule will provide federal agencies with an opportunity to more fully understand the updated 508 Standards. This action is consistent with the legislative intent underlying section 508 which provides a six-month period between publication of the Board's standard and the incorporation of such standard in the Federal Acquisition Regulations. By making the revised 508 Standards effective six months after publication in the Federal Register, they would go into effect at the same time as the FAR Council revisions to the Federal Acquisition Regulations.

With respect to federal ICT contracts, the Board proposes deferring to the FAR Council for establishment of the date on which the revised 508 Standards apply to new ICT-related contracts awarded after publication of the Council's final rule, as well as existing ICT contracts with award dates that precede that final rule.

Question 35. The Board seeks comment on its proposed approach to making its revised 508 Standards effective six months after publication in the Federal Register, with the exception of federal ICT-related procurements. The Board also seeks comment on deferring to the FAR Council to establish the effective date for application of the revised 508 Standards to "new" ICT contracts (i.e., contracts awarded after publication the FAR Council's final rule), as well as existing ICT contracts.

With respect to Section 255, application of the Board's final revised 255 Guidelines to new telecommunications products and customer premises equipment designed, developed, and fabricated after their publication is a matter for the FCC to determine since the FCC has exclusive responsibility for enforcement of Section 255 and issuance of implementing regulations. Nonetheless, in keeping with the Board's past practice in promulgating the existing 255 Guidelines, see 63 FR 5608 (Feb. 3, 1998), the Board proposes making the final revised 255 Guidelines effective 30 days after publication in the Federal Register. Manufacturers of Section 255-covered telecommunications equipment and customer premises equipment need not comply with the Board's revised 255 Guidelines until incorporated into revised FCC regulations.

VIII. Regulatory Process Matters

A. Preliminary Regulatory Impact Analysis (Executive Order 12866)

Executive Orders 13563 and 12866 direct agencies to propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs; tailor the regulation to impose the least burden on society, consistent with obtaining the regulatory objectives; and in choosing among alternative regulatory approaches, select those approaches that maximize net benefits. Important goals of regulatory analysis are to (1) establish whether federal regulation is necessary and justified to achieve a market failure or other social goal and (2) demonstrate that a range of reasonably feasible regulatory alternatives have been considered and that the most efficient and effective alternative has been selected. Executive Order 13563 also recognizes that some benefits are difficult to quantify and provides that, where appropriate and permitted by law, agencies may consider and discuss qualitatively values that are difficult or impossible to quantify, including equity, human dignity, fairness, and distributive impacts.

The Board contracted with an economic consulting firm, Econometrica, Inc. (Econometrica), to assess, among other things, whether the impact of the proposed rule would likely be economically “significant.” Economic significance is defined as any regulatory action that is likely to result in “an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities.”

Econometrica prepared a preliminary regulatory impact analysis (Preliminary RIA). This Preliminary RIA determined, among other things, that the proposed rule is economically significant within the meaning of Executive Order 12866. Below we provide a summary of the preliminary RIA’s methodology and results. A complete copy of this regulatory assessment is available on the Access Board’s website (www.access-board.gov), as well the federal government’s online rulemaking portal (www.regulations.gov). Interested parties are encouraged to review the full Preliminary RIA, and to provide data and other information responsive to requests for comment posed separately in that document. Moreover, while the Board welcomes comments on any aspect of the Preliminary RIA, several areas on which the Board particularly seeks input are identified at the end of this section.

1. Summary of Results

The focus of the Preliminary RIA is to define and, where possible, quantify and monetize the potential economic benefits and costs of the proposed Section 508 Standards and 255 Guidelines. On the benefits side, the Preliminary RIA monetizes incremental benefits under the proposed 508 Standards attributable to: (a) increased productivity of federal employees with certain disabilities who are expected to benefit

from improved ICT accessibility; (b) time saved by members of the public with vision disabilities when using more accessible federal websites; and (c) reduced phone calls to federal agencies as members of the public with certain disabilities shift their inquiries and transactions online due to improved accessibility of federal websites. The Preliminary RIA, for analytical purposes, defines the beneficiary population as persons with vision, hearing, and speech disabilities, as well as those with manipulation, reach, or strength limitations. The Preliminary RIA does not formally quantify or monetize benefits accruing from the proposed 255 Guidelines due to insufficient data and methodological constraints.

From the cost perspective, the Preliminary RIA monetizes likely incremental compliance costs under both the proposed 508 Standards and 255 Guidelines. Monetizable costs under the 508 Standards are expected to be incurred by federal agencies, contractors, and vendors in five broad areas: policy development; employee training; development of accessible ICT; evaluation of ICT; and, development of accessible electronic content. With respect to the 255 Guidelines, the Preliminary RIA monetizes the likely costs to telecommunications equipment manufacturers of ensuring that their respective websites and electronic support documentation conform to accessibility requirements. Insufficient data were available to assess incremental costs related to other new requirements in the proposed 255 Guidelines, including support for real-time text (RTT) functionality.

Table 4 below summarizes the results from the Preliminary RIA with respect to the likely monetized benefits and costs, on an annualized basis, from the proposed 508 Standards and 255 Guidelines. All monetized benefits and costs are incremental to the applicable baseline, and were estimated for a 10-year time horizon using discount rates of 7 and 3 percent.

Table 4 - Annualized Value of Monetized Benefits and Costs under the Proposed 508 Standards and 255 Guidelines, 2015-2024 (in 2015 dollars)

	7- Percent Discount Rate (in millions)	3-Percent Discount Rate (in millions)
Monetized Incremental Benefits		
Benefits to federal agencies from increased productivity by federal employees with addressable disabilities	\$46.6	\$45.3
Benefits to individuals with vision disabilities from improved federal website accessibility	\$2.4	\$2.3
Benefits to federal agencies from reduced call volumes	\$20.1	\$19.8
TOTAL Monetized Incremental Benefits*	\$69.1	\$67.5
Monetized Incremental Costs		

Costs to federal agencies, contractors, and vendors:	\$155.0	\$146.8
(a) In-house	\$80.6	\$76.3
(b) Procured ICT	\$74.4	\$70.5
Costs to telecommunications equipment manufacturers for accessible support	\$10.6	\$9.8
TOTAL Incremental Costs *	\$165.6	\$156.6

(*Note: Totals may not sum due to rounding.)

It is also important to note that some potentially significant benefits and costs from the proposed 508 Standards and 255 Guidelines are not evaluated in the Preliminary RIA, either because they could not be quantified or monetized (due to lack of data or for other methodological reasons) or are inherently qualitative. These unquantified benefits and costs are described qualitatively below.

Evaluation of the economic impact of the proposed Section 508 and 255 requirements is, moreover, complicated by the rapid evolution of ICT devices, platforms, applications, and consensus standards. The benefits and costs of the proposed standards and guidelines ultimately depend not only on technologies that are currently available to achieve compliance, but also on emerging technologies that may provide more cost-effective ways in the future to ensure equal access to ICT for people with disabilities.

2. General Framework of Assessment

Some of the main components of the Preliminary RIA's methodology are as follows:

Estimating the beneficiary population: To estimate the number of federal employees and members of the public with disabilities who could potentially benefit from updated and improved ICT accessibility standards, the Preliminary RIA primarily draws from two data sources. Public data on federal workers with disabilities was obtained from the Office of Personnel Management. Data on the prevalence of various disabilities within the U.S population were obtained from the U.S. Census Bureau's Survey of Income and Program Participation (SIPP) data set, which provides statistics on the non-institutionalized U.S. population.

Identifying incremental changes in the proposed rule: To assess the potential incremental impact of the proposed rule, the Preliminary RIA identifies provisions in the proposed standards and guidelines that would likely increase compliance costs for covered entities (e.g., federal agencies, federal contractors, and manufacturers of telecommunications equipment), as well as provisions that could be expected to reduce the amount of time and effort required for compliance relative to existing requirements.

Developing baseline compliance costs: Estimates of “baseline” compliance costs to covered entities under the existing 508 Standards and 255 Guidelines are drawn from current spending levels for relevant ICT-related products, services, and personnel. For federal agencies, baseline compliance costs under Section 508 include both in-house ICT (e.g., policy development, employee training, development and remediation of websites and electronic documents to ensure accessibility under current standards), and procured ICT (e.g., procurement of Section 508-compliant hardware, software, services from federal contractors and vendors). For telecommunications equipment manufacturers, baseline costs under the existing 255 Guidelines are based on the monetized value of the estimated time manufacturers currently spend making support documentation accessible using estimates developed by the Access Board for the Paperwork Reduction Act. See Section VIII.F (Regulatory Process Matters – Paperwork Reduction Act).

Monetizing expected incremental benefits and costs of the proposed 508 Standards: The Preliminary RIA quantifies and monetizes the expected incremental benefits to federal agencies and members of the public with vision disabilities likely to benefit from the proposed standards. For persons with vision disabilities, benefit calculations are based on the value of time saved due to improved accessibility of federal websites. Benefits to federal agencies are assessed based on the monetized value of reduced call volumes and increased productivity of employees with disabilities owing to ICT accessibility improvements. Compliance costs for federal agencies are classified as either one-time or annual, and are assessed based on various fixed percentages of baseline costs depending on the nature of the cost component at issue (e.g., website remediation, employee training, development of accessible electronic content). Incremental costs and benefits are calculated relative to the applicable baseline over a 10-year analysis period from 2015 through 2024.

Monetizing expected incremental costs of the proposed 255 Guidelines: The Preliminary RIA quantifies and monetizes the expected incremental costs to manufacturers of telecommunications equipment and customer premises equipment (CPE) of complying with new requirements in the proposed guidelines related to accessible electronic support documentation. Benefits attributable to new or updated requirements in the proposed 255 Guidelines—such as the value of improved accessibility for persons with disabilities or cost savings to telecommunications equipment manufacturers—were not evaluated due to insufficient data and the methodological complexity of “mapping” proposed new requirements to particular cost elements in a dynamic and evolving telecommunications marketplace. Compliance costs to telecommunications equipment manufacturers and CPE are classified as either one-time or annual, and are assessed based on various fixed percentages of baseline costs for development of accessible support documentation depending on firm size. Incremental costs are calculated relative to the baseline over a 10-year analysis period from 2015 through 2024.

Describing unquantifiable costs and benefits: For benefits and costs that could be neither quantified nor monetized, the Preliminary RIA qualitatively describes, and assesses the significance of, such costs and benefits.

3. Baseline Compliance Costs

The total costs that federal agencies, vendors, and contractors incur to comply with the current 508 Standards are estimated at \$2.0 billion annually. This amount represents about 2 percent of annual ICT spending, which is estimated at \$80 billion to \$120 billion, depending on which products and services are included in the total. Baseline costs for telecommunications equipment manufacturers to conform to the current 255 Guidelines related to product documentation and user support are estimated at \$114 million annually. Taken all together, the overall baseline compliance costs are therefore estimated at \$2.1 billion annually.

4. Benefits of the Proposed Rule

Overall, results from the Preliminary RIA demonstrate that the proposed 508 Standards will likely have substantial monetizable benefits to federal agencies and persons with disabilities. As shown in Table 4 above, the annualized value of monetized benefits from these proposed standards is estimated to be \$69.1 million over the 10-year analysis period (assuming a 7 percent discount rate). In calculating these monetized benefits, the Preliminary RIA makes the following assumptions: (a) one-half of the recurring annual benefits derived from accessible ICT would be realized in the first year of implementation; and (b) the number of individuals with disabilities who visit federal agency websites will increase every year, but a constant proportion of those individuals will visit such websites every year.

It is also important to note that the proposed rule is expected to generate significant benefits that were not evaluated in the Preliminary RIA, either because they could not be quantified or monetized (due to lack of data or for other methodological reasons) or are inherently qualitative. Estimating the economic impact of a civil rights-based regulatory initiative in an area—and marketplace—as dynamic as ICT is a complex and difficult task. Some of these unquantified (or inherently unquantifiable) benefits of the proposed 508 Standards are listed in Table 5 below. The fact that these benefits could not be formally assessed in this Preliminary RIA should not diminish their importance or value.

Table 5 - Unquantified Benefits of the Proposed Rule

Time savings by people with hearing, cognitive, speech, and manual dexterity or motor impairments from improved federal websites
Improved accessibility of electronic documents on federal websites for persons with addressable disabilities, particularly PDFs and videos
Increased employment of individuals with disabilities
Increased ability of individuals with disabilities to obtain information on federal agency websites and conduct transactions electronically
Greater independence for individuals with disabilities to access information and services on federal agency websites without assistance
More civic engagement by individuals with disabilities due to improved access to

information and services on federal agency websites
Increased ability of persons with hearing impairments to have faster and more natural conversation with real-time text than is possible with current text-messaging systems
Increased ability of individuals with disabilities to evaluate, purchase, and make full use of telecommunications products due to increased accessibility of support documentation and services
Increased ability of individuals without disabilities to access information and conduct their business electronically when they face situational limitations (in a noisy place, in a low-bandwidth environment, or in bright sunlight)
Potential cost savings to federal agencies due to reduced levels of in-person visits and mail correspondence
Larger pool of ICT developers and content creators with accessibility knowledge and skills, providing more choice to federal agencies due to use of internationally recognized, industry-driven standards
Potential cost savings to manufacturers of telecommunications and CPE, state and local governments, and non-profit entities, as internationally harmonized standards reduce costs for ICT manufacturers and allow them to sell a single line of accessible products and services across all types of markets
Intrinsic existence value that individuals both with and without disabilities derive from the non-discrimination and equity values served by Sections 508 and 255

5. Costs of the Proposed Rule

The Preliminary RIA shows that the proposed standards and guidelines will likely increase compliance costs substantially when first implemented, but will thereafter result in only a small percentage increase in recurring annual costs in later years. Overall, the Preliminary RIA estimates that the total incremental cost of the proposed 508 Standards and 255 Guidelines is expected to be \$165.6 million on an annualized basis over the 10-year analysis period, based on a 7 percent discount rate (see Table 4 above).

The Preliminary RIA does not, however, quantify and monetize all potential compliance costs arising from the proposed rule—due primarily to insufficient data or for other methodological limitations. The impact of the proposed 255 Guidelines on telecommunications equipment manufacturers is, as the Preliminary RIA notes, particularly difficult to quantify. (Information on the impact of the proposed guidelines was solicited unsuccessfully in both the 2010 and 2011 ANPRMs.) Some of these unquantified costs of the proposed 508 Standards and 255 Guidelines are listed in Table 6 below.

Table 6 - Unquantified Costs of the Proposed Rule

Possible increase in federal government expenditures to provide accommodations if the government hires more people with addressable disabilities
Possible decrease in the amount or variety of electronic content produced, as government seeks to reduce Section 508 compliance costs
Potential costs to state and local governments and non-profit organizations that may be

required to make electronic content accessible in order to do businesses with federal agencies
Costs to ICT manufacturers of developing and producing hardware and telecommunications products that comply with proposed requirements
Costs to telecommunications firms to implement and support real-time text on telecommunications devices with text display capabilities

In addition, incremental cost estimates in the Preliminary RIA do not reflect other potentially influential factors that may occur over time—such as future changes in the fiscal environment and its effect on ICT budgets, the impact of recent government-wide initiatives to manage ICT more strategically, efforts to harmonize standards for a global ICT market, and trends in technological innovation.

6. Conclusion

While the Preliminary RIA estimates that incremental costs, as assessed and monetized in the assessment, exceed the monetized benefits of the proposed rule, this finding represents only a piece of the regulatory story. Today, though ICT is now woven into the very fabric of everyday life, millions of Americans with disabilities often find themselves unable to use—or use effectively—computers, mobile devices, federal agency websites, or electronic content. The Board's existing standards and guidelines are greatly in need of a “refresh” to keep up with technological changes over the past fifteen years. The Board expects this proposed rule to be a major step toward ensuring that ICT is more accessible to and usable by individuals with disabilities—both in the federal workplace and society generally. Indeed, much—if not most—of the benefits expected to accrue from the proposed rule are difficult if not impossible to quantify or monetize, including: greater social equality, human dignity, and fairness. These are all values that, under Executive Order 13563,¹³ may properly be considered in the benefit-cost calculus.

Moreover, American companies that manufacture telecommunications equipment and ICT-related products would likely derive significant benefits from the harmonized accessibility standards. Given the relative lack of existing national and globally-recognized standards for accessibility of mobile technologies, telecommunications equipment manufacturers would greatly benefit from harmonization of the 255 Guidelines with consensus standards. Similar benefits would likely accrue more generally to all ICT-related products as a result of harmonization. These manufacturers would earn return on investments in accessibility technology, remain competitive in the global marketplace, and achieve economies of scale created by wider use of nationally and internationally recognized technical standards.

¹³ See also Office of Management and Budget, Circular A-4 (2003); Office of Management and Budget, Regulatory Impact Analysis: A Primer 3 (2011), available at: http://www.whitehouse.gov/sites/default/files/omb/inforeg/regpol/circular-a-4_regulatory-impact-analysis-a-primer.pdf.

Accordingly, when considering all unquantified benefits and costs, the Access Board, along with its consulting economic firm (Econometrica), jointly conclude that the benefits of the proposed update of the 508 Standards and 255 Guidelines justify its costs.

The Access Board welcomes comments on any aspect of the Preliminary RIA to improve the assumptions, methodology, and estimates of the incremental benefits and costs (baseline and incremental) of the proposed rule. The full Preliminary RIA sets forth numerous regulatory assessment-related questions or areas for public comment. In addition, the Board provides below several additional questions on which it seeks input:

Question 36. The Board requests information from telecommunications equipment manufacturers concerning expected one-time and ongoing costs associated with implementation of the proposed technical requirements related to support for real-time text (RTT) functionality. Please be as specific as possible. The Board is also interested in hearing from other stakeholders —particularly persons with disabilities—about the nature and scope of benefits provided by RTT in emergency and non-emergency settings. How might the Board quantify or monetize such benefits?

Question 37. The Board requests information from telecommunications equipment manufacturers concerning potential benefits that would accrue from harmonization of technical requirements in the proposed rule with national and international consensus standards? Both cost savings data and qualitative information are requested.

Question 38. The proposed rule would, among other things, require federal agency websites and electronic content to conform to WCAG 2.0 or PDF/UA-1. Do federal agencies believe that the Preliminary RIA adequately captures their potential costs to comply with these requirements? If not, how might the analysis be improved? Are there significant cost elements missing from the Preliminary RIA? Please be as specific as possible.

Question 39. The Preliminary RIA does not monetize benefits for persons with non-vision disabilities due to a lack of data on which to base estimated time savings. The Board requests data and other information on the likely time savings for persons with hearing, motor or dexterity, speech, or cognitive disabilities from using accessible websites as compared to websites with low accessibility. Are there empirical research studies from which time savings estimates may be derived?

Question 40. The Board also seeks information from persons with disabilities who would benefit from improved accessibility of federal agency websites. How frequently do they visit federal agency websites, and for what duration and purposes? Are there other suggested methods of quantifying benefits accruing from accessible agency websites other than (or in addition to) monetizing time savings? To the extent that benefits from accessible agency websites cannot be quantified, the Board welcomes examples of personal or anecdotal experience that illustrate the value of improved accessibility of federal websites.

Question 41. In addition to the questions for public comment posed in the Preliminary RIA and elsewhere in this NPRM, the Board is interested in hearing from the public more generally with information that would aid analysis of the costs and benefits of individual requirements in the 508 Standards and 255 Guidelines at the final rule stage. Is there a better way than the methodology used in the Preliminary RIA to “map” the incremental costs and benefits of particular technical and functional requirements to various stakeholders? If so, how might the analysis be improved? Are there other suggested sources for unit cost data other than those cited in the Preliminary RIA?

7. Alternatives

We considered two alternative approaches to updating the existing 508 Standards and 255 Guidelines:

- In the 2010 ANPRM, the Board proposed a set of requirements that were based on, but not identical to, the WCAG 2.0 standards and other voluntary consensus standards. Comments received from the public indicated that this approach was potentially confusing, as federal agencies, contractors, and vendors would have to make specific compliance determinations in cases where the language used in the proposed 508 Standards differed from that in the referenced standard.
- The Board also considered requiring ICT to comply with the full set of functional performance criteria, which state in general terms the features of ICT that ensure its accessibility to people with one or more of different types of disabilities. Comments indicated that this approach would make it difficult for ICT producers to be able to determine whether or not their products and services were compliant with the proposed 508 Standards.

Based on the public feedback on the two policy alternatives, we determined that the clearest and most cost-effective way to set out the proposed accessibility requirements was to identify and reference existing, voluntary consensus standards directly, wherever possible.

B. Regulatory Flexibility Act

The Regulatory Flexibility Act of 1980 (RFA), as amended (5 U.S.C. 601 - 612) requires agencies to evaluate the potential effects of their rulemakings on small entities.¹⁴ Section 603 of the RFA requires agencies to prepare and make available for public comment an initial regulatory flexibility analysis describing the impact of proposed rules on small entities. Because the proposed 255 Guidelines regulate non-federal entities (e.g., telecommunications equipment manufacturers), these guidelines fall within the purview of the RFA. The proposed 508 Standards, on the other hand, directly regulate only federal entities that are not covered by the RFA. Accordingly, the Access Board

¹⁴ See also Small Business Regulatory Enforcement Fairness Act of 1996, Pub. L. No. 104-121, 110 Stat. 857 (codified at 5 U.S.C. 601 et seq.); E.O. 13272, 67 FR 53,461 (Aug. 16, 2002).

evaluates here only the impact of the proposed 255 Guidelines on small entities. The Board provides below an initial regulatory flexibility analysis (Initial RFA) for these proposed guidelines.

Description of the reasons why the Access Board is considering regulatory action.

Section 255 of the Communications Act of 1934 (47 U.S.C. 255), as amended, requires telecommunication equipment to be accessible to and usable by individuals with disabilities, where readily achievable. The Access Board is statutorily responsible for developing accessibility guidelines for telecommunications equipment and customer premises equipment (CPE). The Access Board is also required to review and update the guidelines periodically. The Federal Communications Commission (FCC), however, is solely responsible for issuing implementing regulations and enforcing Section 255. The FCC is not bound to adopt the Access Board's guidelines as its own or to use them as minimum standards.

In 1998, the Board issued the existing 255 Guidelines (36 CFR Part 1193). Since then, telecommunications technology and commercial markets have changed dramatically, along with the usage of telecommunications equipment. Given these tremendous changes, the Board is proposing to update the 255 Guidelines.

Objectives of, and legal basis for, the proposed rule. The Board's proposed 255 Guidelines would provide a much-needed "refresh" of the existing 255 Guidelines, and, thereby, better support the access needs of individuals with disabilities, while also taking into account incremental compliance costs to covered manufacturers of CPE and telecommunications equipment. The proposed guidelines would be applicable only to new products to the extent that compliance is readily achievable; they would not require retrofitting of existing equipment or retooling. Manufacturers may consider costs and available resources when determining whether, and the extent to which, compliance is required.

Description and estimate of the number of small entities to which the proposed rule will apply. The proposed 255 Guidelines cover manufacturers of telecommunications equipment and CPE, as well as the manufacturers of equipment that functions as telecommunications and CPE.¹⁵ The Board used publicly available data from the Office of Advocacy of the Small Business Administration (SBA) to estimate the number of small businesses that may be affected by the proposed guidelines. The North

¹⁵ Examples of CPE include wireline and wireless telephones or computers when employed on the premises of a person to originate, route, or terminate telecommunications (e.g., Internet telephony, interconnected VoIP). Only a computer with a modem can function as telecommunications equipment and only the modem functions are associated with telecommunications. Therefore, the requirements of the proposed rule apply only to the modem functions and incidental functions required for turning the computer on and launching the telecommunications programs. All other functions of the computer not related to telecommunications would not be covered, such as word processing or file searching or video conferencing.

American Industry Classification System (NAICS) is the standard used by federal statistical agencies in classifying business establishments.¹⁶

To determine the number of small businesses potentially subject to the proposed 255 Guidelines, the Board reviewed NAICS industry classifications and SBA small business size standards. The Board determined that three NAICS-based industry classifications may be subject to the proposed 255 Guidelines. These industry categories and their accompanying six-digit NAICS codes are: (a) NAICS Code 334210 – Telephone Apparatus Manufacturing; (b) NAICS Code 334220 – Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing; and (c) NAICS Code 334111 – Electronic and Computer Manufacturing. The Board then matched these three NAICS classifications with SBA small business size standards (based on number of employees) to determine the number of small business within each of the respective classifications.¹⁷

Table 7 below provides the potential number of small businesses, based on SBA size standards, for each of the three types of equipment manufacturers (by NAICS code) that may be affected by the proposed 255 Guidelines.

¹⁶ The U.S. Census Bureau provides detailed information on the National Industry Classification System on the agency's website. See U.S. Census Bureau, Introduction to NAICS, <http://www.census.gov/eos/www/naics/>.

¹⁷ SBA provides, on its website, small business size standards for each NAICS code, as well as firm size information based on census data. See, e.g., U.S. Small Business Administration, Table of Small Business Size Standards, <https://www.sba.gov/content/small-business-size-standards> (last accessed Dec. 15, 2014); Office of Advocacy, SBA, Firm Size Data, <https://www.sba.gov/advocacy/firm-size-data> (last accessed Dec. 15, 2014).

Table 7 - Small Businesses Potentially Affected by the Proposed 255 Guidelines

NAICS code	Industry title	SBA size standard	Number of firms	Number of small firms
334210	Telephone Apparatus Manufacturing	1,000 or fewer employees	263	242
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	750 or fewer employees	730	675
334111	Electronic Computer Manufacturing	1,000 or fewer employees	391	374
TOTAL			1,384	1,291

A few notes are in order about the foregoing estimates of the number of small firms potentially affected by the 255 Guidelines. First, because all telephone equipment is covered by Section 255, all entities included in the telephone apparatus manufacturing category (334210) are necessarily subject to the guidelines. However, not all entities in the remaining two industry categories (334220 and 334111) are covered by the proposed guidelines because many of these entities may manufacture only equipment that falls outside the scope of Section 255. For example, only radio and broadcasting equipment that meets the statutory definition of telecommunications (that is, “the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received”), is covered by the proposed guidelines. Also, computers lacking modems or Internet telephony software are not covered by the proposed guidelines. However, the Board lacks quantitative information to differentiate regulated from non-regulated manufacturing firms within these two NAICS categories, as well as to determine how many of the “small businesses” in each NAICS category are subject to the proposed guidelines. The number of small entities listed in Table 7 that may be affected by the proposed 255 Guidelines should, therefore, be considered an upper-bound estimate.

Second, given that manufacturers of telecommunications equipment and CPE must comply with Section 255 only to the extent such compliance is “readily achievable” (i.e., easily accomplishable and able to be carried out without much difficulty or expense), there will likely be some small firms for which compliance with the proposed guidelines will prove too difficult or expensive. This is not a new proposition. Under both the existing guidelines and current FCC regulations, compliance for manufacturing firms of all sizes is limited by the readily achievable exception, though such exception necessarily applies with greater frequency to smaller entities. (See 36 CFR 1193.21; 47 CFR 6.3(g)). The Board also understands that many small firms in the three NAICS categories listed above serve as partners or suppliers to larger firms that provide a full range of products and services. For these reasons, the Board assumes that many small firms identified in Table 7—particularly those with fewer than 20 employees—likely would not incur new costs under the proposed 255 Guidelines. Accordingly, the

mid-point estimate for the number of small businesses that may be affected by the proposed 255 Guidelines is assumed to be small firms that meet the SBA size standards and employ twenty or more workers.

Description of the projected reporting, record keeping, and other compliance requirements for small entities. As discussed above, the proposed 255 Guidelines contain many requirements that are similar to the existing guidelines. There, are, however, two new proposed requirements that would apply to manufacturers of telecommunications equipment and CPE: 410.6 (real-time text functionality) and 602.3 (electronic support documentation). These two new requirements would potentially impose new costs on small manufacturing firms.

Regarding real time text (RTT) requirements under proposed 410.6, the Board lacks quantitative cost information. We requested information on RTT costs in the 2010 and 2011 ANPRMs, but did not receive specific cost data. Accordingly, we cannot, at this time, quantify or monetize the potential cost impact of the proposed RTT requirements in the 255 Guidelines. The Board does, however, seek comment on how to estimate the cost impact of the RTT requirements on small businesses subject to the 255 Guidelines so that we may use such information to prepare, as needed, a final regulatory flexibility analysis.

With respect to the new obligation in proposed 602.3 for Section 255-covered manufacturers to ensure the accessibility of electronic support documentation (such as web-based self-service support and electronic manuals), the Preliminary RIA develops estimated incremental costs, heavily relying on the cost methodology used by the Department of Transportation (DOT) in the regulatory assessment of its recent final rule requiring, among other things, airlines to make their websites accessible to persons with disabilities.¹⁸ (See Section VIII.A – Regulatory Process Matters – Preliminary Regulatory Impact Analysis).

Based on the methodology and estimates used in the Preliminary RIA, the Board's Initial RFA assesses potential compliance costs for small manufacturers of telecommunications equipment and CPE based on estimated (a) one-time costs to create accessible electronic support documentation and websites, and (2) recurring, annual maintenance costs. One-time costs are assumed to be spread equally over the first two years (i.e., half of covered firms realizing costs in the first year, and the other half in year two), with annual maintenance costs incurred thereafter for the remainder of the 10-year regulatory horizon. Estimated compliance costs are based on firm size. For small businesses with 100 or more employees, average one-time costs are assumed to be \$125,000 for bringing their respective support documentation and websites into compliance with the proposed 255 Guidelines. For firms with fewer than

¹⁸ Dept. of Transportation, Nondiscrimination on the Basis of Disability in Air Travel: Accessibility of Web Sites and Automated Kiosks at U.S. Airports, 78 FR 67882 (Nov. 12, 2013); Econometrica, Inc., Final Regulatory Analysis on the Final Rule on Accessible Kiosks and Web Sites (Oct. 23, 2013), available at: <http://www.regulations.gov/#!documentDetail;D=DOT-OST-2011-0177-0108>; see also Preliminary RIA, Sections 6.3, 8.11.

100 employees, average per-firm one-time costs under the proposed guidelines are assumed to be \$25,000. Annual recurring maintenance costs are estimated as twenty percent of one-time costs regardless of firm size.

Using these cost assumptions, the Initial RFA evaluates the monetary impact of the proposed 255 Guidelines from three perspectives. The first scenario uses the upper-bound estimate for small businesses that may be affected by the proposed guidelines (i.e., all small firms meeting SBA size standards) to assess total one-time and annual maintenance costs across all affected industry categories. These costs, which should be considered an upper-bound estimate, are reflected below:

Table 8 - Estimated Incremental Costs for Small Manufacturing Firms Subject to the Proposed 255 Guidelines (Scenario 1 – All Firms)

Firm size	Firms meeting SBA size standards	Average one-time cost per firm	Total one-time costs	Average annual maintenance cost per firm	Total annual maintenance costs
100 or more employees	124	\$125,000	\$15,500,000	\$25,000	\$3,100,000
99 or fewer employees	1167	\$25,000	\$29,175,000	\$5,000	\$5,835,000
Total	1291		\$44,675,000		\$8,935,000

Second, to reflect the reality that compliance may not be readily achievable for the smallest firms (and, as well, the fact that such firms often serve as suppliers to larger firms and thus may not be covered by Section 255), the second scenario uses the mid-point estimate for small businesses that may be affected by the proposed guidelines (i.e., small firms that meet the SBA size standards and have twenty or more employees) to assess total one-time and annual maintenance costs across all industry categories. These costs, which should be considered a mid-point estimate, are reflected below:

Table 9 - Estimated Incremental Costs for Small Manufacturing Firms Subject to the Proposed 255 Guidelines (Scenario 2–Firms with 20 or More Employees)

Firm size	Firms meeting SBA size standards	Average one-time cost per firm	Total one-time costs	Average annual maintenance cost per firm	Total annual maintenance costs
100 or more employees	124	\$125,000	\$15,500,000	\$25,000	\$3,100,000
20-99 employees	278	\$25,000	\$6,950,000	\$5,000	\$1,390,000
Total	402		\$22,450,000		\$4,490,000

Third, to assess the magnitude of potential compliance costs for small businesses under the proposed 255 Guidelines relative to annual receipts, the third scenario evaluates the ratio of average annualized costs per-firm to average receipts per firm for each of the three NAICS codes. Average annualized costs represent the per-firm stream of estimated one-time and recurring annual costs over the 10-year regulatory horizon at a 7 percent discount rate. Annualized costs are assumed to be consistent across the three NAICS codes for each of the two studied small firm sizes (i.e., more or less than 100 employees) because the Board does not have NAICS code-based data differentiating receipts by firm size. Annual estimated average per-firm receipts for each NAICS code, in turn, are derived from publicly-available SBA data. The ratio of average per-firm annualized costs and annual per-firm receipts is then calculated for each NAICS code and firm size, with the resulting percentage serving as a metric to evaluate the relative economic significance of compliance costs to small businesses under the proposed 255 Guidelines.

The results are presented below in two separate tables by the size (in terms of number of employees) of small firms covered by Section 255.

Table 10 - Ratio of Annualized Per-Firm Costs to Receipts for Small Firms with 100 or More Employees (by NAICS Code)

NAICS code	Industry title	Average annualized costs per small firm (7% discount rate)	Average estimated per-firm annual receipts	Ratio of average annualized per-firm costs/Per-firm receipts (percent)
334210	Telephone Apparatus Manufacturing	\$28,782	\$58,969,940	.049
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	\$28,782	\$46,860,776	.060
334111	Electronic Computer Manufacturing	\$28,782	\$75,919,848	.038

*Annual receipts based on data from the Small Business Administration, U.S. Small Business Administration, Firm Size Data - Statistics of U.S. Businesses (SUSB), <https://www.sba.gov/advocacy/firm-size-data> (last accessed Dec. 15, 2014). SUSB employer data is collected and produced by the U.S Census and contains, for each NAICS code such information as the number of firms, employment figures, estimated annual receipts, and annual payroll.

Table 11 - Ratio of Annualized Per-Firm Costs to Receipts for Small Firms with Less Than 100 Employees (by NAICS Code)

NAICS code	Industry title	Average annualized costs per small firm (7% discount rate)	Average estimated per-firm annual receipts	Ratio of average annualized per-firm costs/Per-firm receipts (percent)
334210	Telephone Apparatus Manufacturing	\$5,756	\$58,969,940	.010
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	\$5,756	\$46,860,776	.010
334111	Electronic Computer Manufacturing	\$5,756	\$75,919,848	.008

*Annual receipts based on data from the Small Business Administration, U.S. Small Business Administration, Firm Size Data - Statistics of U.S. Businesses (SUSB), <https://www.sba.gov/advocacy/firm-size-data> (last accessed Dec. 15, 2014). SUSB employer data is collected and produced by the U.S Census and contains, for each NAICS code such information as the number of firms, employment figures, estimated annual receipts, and annual payroll.

The results of these average cost/receipt analyses demonstrate that incremental costs of the proposed 255 Guidelines for small businesses—whether larger or smaller than 100 employees—are expected to be minimal relative to firm receipts. In no case would this ratio exceed about one-half of a percent, with ratios ranging from a low of 0.008 to a high of 0.049. Accordingly, based on the foregoing analysis, the Board does not believe that the proposed 255 Guidelines are likely to have a significant economic impact on a substantial number of small entities.

Question 42. The Board requests input from manufacturers of telecommunications equipment and customer premises equipment, as well as other interested parties, on the small business cost estimation methodology and assumptions used in this Initial RFA. The Board will use relevant information provided in public comments to determine whether or how to revise our estimates for the final regulatory flexibility analysis.

Duplication with other federal rules. To the Board's knowledge, there are no relevant federal rules that duplicate, overlap, or conflict with the proposed 255 Guidelines.

Description of significant alternatives to the proposed 255 Guidelines. In the Board's view, there are no alternatives to the proposed guidelines that would accomplish the goal of meeting the access needs of individuals with disabilities, while taking into account compliance costs of manufacturers of telecommunications equipment and CPE.

C. Executive Order 13132: Federalism

The proposed rule adheres to the fundamental federalism principles and policy making criteria in Executive Order 13132. The proposed 508 Standards apply to the development, procurement, maintenance, or use of ICT by federal agencies. The proposed 255 Guidelines apply to manufacturers of telecommunications equipment and customer premises equipment and require that equipment is designed, developed, and fabricated to be accessible to and usable by individuals with disabilities, if it is readily achievable to do so. As such, the Board has determined that the proposed rule does not have federalism implications within the meaning of Executive Order 13132.

D. Executive Order 13609: Promoting International Regulatory Cooperation

Executive Order 13609 serves to promote international regulatory cooperation and harmonization. The Access Board has tried to promote the principles of the executive order by making concerted efforts with a number of foreign governments throughout the development of the proposed 508 Standards and 255 Guidelines. For example, the Board and the European Commission have made every effort to coordinate development of their respective ICT standards. This cooperation began with the 2005 EU-US Economic Initiative

(http://trade.ec.europa.eu/doclib/docs/2006/june/tradoc_127643.pdf) and continued through the work of the Access Board with representatives from the European Commission, Canada, Australia, and Japan serving on the Telecommunications and Electronic and Information Technology Advisory Committee which informed the proposed 508 Standards and 255 Guidelines. In our view, the proposed 508 Standards and 255 Guidelines are the product of the Board's coordination with international regulatory partners, which will ultimately help American companies better compete globally.

E. Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act does not apply to proposed or final rules that enforce constitutional rights of individuals or enforce statutory rights that prohibit discrimination on the basis of race, color, sex, national origin, age, handicap, or disability. The proposed 508 Standards are issued pursuant to the Rehabilitation Act. When federal agencies develop, procure, maintain, or use electronic and information technology, they are required to ensure that the electronic and information technology allows federal employees with disabilities to have access to and use of information and data that is comparable to the access enjoyed by federal employees without disabilities, unless doing so would impose an undue burden on the agency. The statute also requires that members of the public with disabilities seeking information or services from a federal agency have access to and use of information and data that is comparable to that provided to other members of the public unless doing so would impose an undue burden on the agency. We have issued the proposed 255 Guidelines pursuant to

Section 255 of the Communications Act of 1934 which requires manufacturers of telecommunications equipment and customer premises equipment to ensure that the equipment is designed, developed, and fabricated to be accessible to and usable by individuals with disabilities, if it is readily achievable to do so. Accordingly, an assessment of the effect of the proposed 508 Standards and 255 Guidelines on state, local, and tribal governments is not required by the Unfunded Mandates Reform Act.

F. Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501 - 3521) requires federal agencies to obtain approval from the Office of Management and Budget (OMB) before requesting or requiring a “collection of information” from the public. As part of the PRA process, agencies are generally required to provide a 60-day notice in the Federal Register concerning each proposed collection of information to solicit, among other things, comment on the necessity of the information collection and its estimated burden. 44 U.S.C. 3506(c)(2)(A). To comply with this requirement, the Board publishes here a notice of proposed collection of information in the proposed 255 Guidelines.

Proposed C206, along with several provisions in Chapter 6 (Support Documentation and Services), collectively obligate manufacturers of telecommunications equipment and customer premises equipment to provide accessible support documentation and services, which constitute “collection of information” under the PRA. More specifically, the proposed rule requires covered manufacturers, when providing support documentation and services, to ensure accessibility for individuals with disabilities with respect to four categories of information as follows: (1) support documentation must list and explain how to use accessibility and compatibility features of telecommunications products (602.2); (2) electronic support documentation must conform to WCAG 2.0 or PDF/UA-1 (602.3); (3) non-electronic support documentation in alternate formats (e.g., braille, large print), which is available upon request, must be usable by users with vision impairments (602.4); and (4) support services (e.g., help desks, call centers) must offer information on accessibility and compatibility features, as well as ensure a contact method that accommodates the communication needs of individuals with disabilities (603.2 and 603.3).

These four proposed information collection requirements are generally similar to those under existing 255 Guidelines § 1193.33, which were previously reviewed and approved by the Office of Management and Budget (OMB) in accordance with the PRA (OMB Control Number 3014-0010), though compliance with WCAG 2.0 (or PDF/UA-1) is new. The newly proposed information collection is the requirement that telecommunications equipment manufacturers ensure that any electronic documentation (such as web-based self-service support or PDF user guides) provided to end users must meet specified accessibility standards (602.3).

The Board estimates the annual burden on manufacturers of telecommunications equipment and customer premises equipment for the four categories of information collection under the proposed rule as follows:

Table 12 - Estimated Annual Recordkeeping and Documentation Burden

Section of proposed rule	Number of respondents	Annual number of responses per respondent	Average response time (hours)	Estimated annual burden (hours)
Section 602.2	1,384	6	1.5	12,456
Section 602.3	1,384	95% of 6	300	2,366,640
Section 602.4	1,384	5% of 6	25	10,375
Section 603	1,384	6	.5	4,152
Total				2,393,623

These estimates are based on the Board's experience with the current information collection requirements under the existing 255 Guidelines, as well as public comment received in response to the 2010 and 2011 ANPRMs. Highlighted below are the key assumptions used in the burden estimation calculus.

Number of respondents. The number of manufacturers of telecommunications equipment and customer premises equipment (1,384) is based on the number of firms assumed to be affected by the proposed rule using the North American Industry Classification System (NAICS). See Section IV.B (Regulatory Process Matters – Regulatory Flexibility Act).

Number of responses annually per manufacturer. The number of annual responses for each manufacturer (6) is based on the estimated number of new products released in 2013 according to the Consumer Electronic Association.

Average response time.

- Section 602.2: The estimated response time assumes that documenting the accessibility and compatibility features will take 1.5 hours for each new product.
- Section 602.3: The estimated response time assumes that development of accessible electronic support documentation will take 300 hours for each new product. This estimate, in turn, is based on the assumption that each product will have, on average, 200 pages of electronic documentation, and that each page will require 1.5 hours of formatting and editing to comply with WCAG 2.0 or PDF/UA-1, as applicable. With respect to the annual number of responses for each manufacturer, it is assumed that support documentation for nearly all new products will be provided in an electronic format given current trends in the telecommunications industry. Specifically, it is estimated that 95 percent of the six new products introduced annually by each manufacturer (7,889 products) will have electronic support documentation that must conform to proposed 602.3.
- Section 602.4: The estimated response time assumes that development of accessible non-electronic support documentation in alternate formats (e.g., braille, large print) will take 25 hours for each new product. With respect to the

annual number of responses for each manufacturer, it is assumed that support documentation for only a few new products will have support documentation in a non-electronic format in recognition of the fact that most support documentation is now posted online or otherwise provided in electronic formats. Thus, it is assumed that only 5 percent of the six new products introduced annually by each manufacturer (415 products) will have non-electronic support documentation that must conform to proposed 602.4.

- Section 603: The estimated response time assumes that, for each new product in a given year, manufacturers will receive three 10-minute telephone calls to support centers (or emails or chat-based interactions) from individuals with disabilities seeking information on the accessibility and compatibility features of these products.

The Board seeks comment on the methods and assumptions used in estimating the annual burden associated with the information collection requirements in the proposed 255 Guidelines. Organizations and individual desiring to submit comments on this information collection requirements should direct them to the Office of Information and Regulatory Affairs, OMB, Room 10235, New Executive Office Building, Washington, DC 20503; Attention: Desk Officer for the Access Board.

The Board requests comments on these proposed collections of information in:

- Evaluating whether the proposed collection of information is necessary for the proper implementation of Section 255, including whether the information will have a practical use;
- Evaluating the accuracy of the Board's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used;
- Enhancing the quality, usefulness, and clarity of the information to be collected; and
- Minimizing the burden of collection of information of those who are to respond, including through the use of appropriate automated electronic, mechanical, or other technological collection techniques or other forms of information technology (e.g., permitting electronic submission of responses).

OMB is required to make a decision concerning the collection of information contained in these proposed guidelines between 30 and 60 days after publication of this document in the Federal Register. Therefore, a comment to OMB is best assured of having its full effect if OMB receives it within 30 days of publication. This does not affect the deadline for the public to comment to the Board on the NPRM.

G. Availability of Materials Incorporated by Reference

As noted previously in the Section-by-Section Analysis for proposed E102 and C102, the Access Board is proposing to incorporate by reference ten consensus standards in

the 508 Standards and 255 Guidelines. See Section VI.B (Section-by-Section Analysis - 508 Standards: Application and Scoping – E102) and Section VI.C (Section-by-Section Analysis - 255 Guidelines: Application and Scoping – C102). The Office of the Federal Register recently promulgated a final rule requiring federal agencies to provide additional information to the public in regulatory preambles for materials to be incorporated by reference.¹⁹

In keeping with these new obligations for materials proposed for incorporation by reference, the Access Board provides below: (a) information on the public availability of these ten standards (or, alternatively, how Access Board staff attempted to secure the availability of these materials to the public at no cost or reduced cost, if not already publicly available free of charge by the standards development organization); and (b) summaries of the materials to be incorporated by reference. In addition to the information provided below relating to public availability, a copy of each referenced standard is available for inspection at our agency's office, 1331 F Street NW, Suite 1000, Washington, DC 20004.

ANSI/HFES 200.2 (2008) Human Factors Engineering of Software User Interfaces — Part 2: Accessibility (referenced in: E102.2, C102.2, 502.4). This standard provides design specifications for human-system software interfaces to increase accessibility for persons with disabilities. It covers the design of accessible software for people with a wide range of physical, sensory and cognitive abilities, including those with temporary disabilities and older adults. Availability: Copies of this standard may be obtained from Human Factors and Ergonomics Society (HFES), P.O. Box 1369, Santa Monica, CA 90406-1369. This standard is also available for purchase on the HFES website (<http://www.hfes.org>). Additionally, HFES has agreed to make a read-only copy of this standard available during the comment period upon request.

ANSI/IEEE C63.19-2011 American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids (see E102.3, C102.3, 410.4.1). This standard provides a uniform method of measurement for compatibility between hearing aids and wireless communications devices. Availability: Copies of this standard may be obtained from the Institute of Electrical and Electronics Engineers (IEEE), 10662 Los Vaqueros Circle, P.O. Box 3014, Los Alamitos, CA 90720-1264. This standard is also available for purchase on the IEEE website (<http://www.ieee.org>). IEEE has also agreed to make a read-only version of this standard available on the organization's website during the comment period.

A/53 Digital Television Standard, Part 5: 2010 AC-3 Audio System Characteristics (2010) (see E102.4, C102.4, 412.1.1). The standard for digital television provides the system characteristics for advanced television systems. The document and its normative parts provide detailed specification of system parameters. Part 5 provides the audio system characteristics and normative specifications. It includes the Visually

¹⁹ Office of the Federal Register, Incorporation by Reference, 79 FR 66267 (Nov. 7, 2014) (to be codified at 1 CFR Part 51).

Impaired (VI) associated service, which is a complete program mix containing music, effects, dialogue and a narrative description of the picture content. ATSC also publishes a companion technical assistance guide for its television standard. Availability: Copies of this standard may be obtained from the Advanced Television Systems Committee (ATSC), 1776 K Street NW, Suite 200, Washington, DC 20006-2304. Free copies of A/53 Digital Television Standard are available online at the organization's website: (http://www.atsc.org/cms/standards/a53/a_53-Part-5-2010.pdf).

Request for Comment (RFC) 4103, Real-Time Transport Protocol Payload for Text Conversation (2005) (see E102.5, C102.5, 410.6.3.2). This standard establishes specifications for how to carry real-time text (RTT) conversation session contents in Real-time Transport Protocol (RTP) packets. RTT is used alone or in connection with other conversational modalities to form multimedia conversation services. RTT in multimedia conversation sessions is sent character-by-character as soon as it is available, or with a small delay for buffering. Availability: Free copies of this standard are available online at the Internet Engineering Task Force's website (<http://www.rfc-base.org/txt/rfc-4103.txt>).

ISO 14289-1 (PDF/UA-1) Document management applications — Electronic document file format enhancement for accessibility — Part 1: Use of ISO 32000-1 (2014) (see E102.6, C102.6, E205.1, 602.3.1). This standard is the consensus international specification for accessible PDF. PDF/UA-1 provides a technical, interoperable standard for the authoring, remediation and validation of PDF content to ensure accessibility for people with disabilities who use assistive technology, such as screen readers, screen magnifiers, joysticks and other technologies used to navigate and read electronic content. Availability: Copies of this standard may be obtained from the International Organization for Standardization (ISO), ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56 - CH-1211 Geneva 20, Switzerland. This standard is also available for purchase on the ISO website (<http://www.iso.org>). Access Board staff is in discussion with ISO about making a read-only version of this standard available on the organization's website during the comment period. Please consult the Access Board website for updates on the availability of this standard during the comment period.

ITU-T Recommendation G.722: Series G: Transmission Systems and Media, Digital Systems and Networks Digital Terminal Equipments [sic] – Coding of voice and audio signals, 7 kHz Audio-Coding within 64 Kbits/s (September 2012) (see E102.7.1, C102.7.1, 410.5). This standard specifies a coder-decoder program that provides 7 kHz wideband audio at data rates from 48, 56, and 64 kbits/s. Availability: This standard may be obtained from the International Telecommunication Union, Telecommunications Standardization Sector (ITU-T), Place des Nations CH-1211, Geneva 20, Switzerland. Free copies of ITU-T Recommendation G.72 are available online at the organization's website (<http://www.itu.int/rec/T-REC-G.722-201209-I/en>).

ITU-T Recommendation E.161: Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network (February 2001) (see E102.7.2, C107.2, 407.3.2). This standard defines the assignment of the basic 26 Latin letters (A to Z) to the 12-key telephone keypad.

Availability: This standard may be obtained from ITU-T, Place des Nations CH-1211, Geneva 20, Switzerland. Free copies of ITU-T Recommendation E.161 are available online at the organization's website (<https://www.itu.int/rec/T-REC-E.161-200102-I/en>).

TIA 825-A, A Frequency Shift Keyed Modem for Use on the Public Switched Telephone Network (2003) (see E102.8.1, C102.8.1, 410.6.3.1). This standard is a specification for TTY signals on the public switched telephone network interface. Availability: Copies of this standard, which is published by the Telecommunications Industry Association (TIA), may be obtained from the IHS Standard Store (IHS), 15 Inverness Way East, Englewood, CO 80112. This standard is also available for purchase on the IHS website (<https://www.global.ihs.com>). Additionally, TIA has agreed to make a read-only version of this standard available, upon request, through TIA's website (www.tiaonline.org) during the comment period.

TIA 1083 Telephone Terminal Equipment Handset Magnetic Measurement Procedures and Performance Requirements (2007) (see E102.8.2, C102.8.2, 410.4.2). This standard defines measurement procedures and performance requirements for the handset generated audio band magnetic noise of wire line telephones, including digital cordless telephones. Availability: Copies of this standard, which is published by the Telecommunications Industry Association (TIA), may be obtained from the IHS Standard Store (IHS), 15 Inverness Way East, Englewood, CO 80112. This standard is also available for purchase on the IHS website (<https://www.global.ihs.com>). Additionally, TIA has also agreed to make a read-only version of this standard available, upon request, through TIA's website (www.tiaonline.org) during the comment period.

Web Content Accessibility Guidelines (WCAG) 2.0, W3C Recommendation (December 2008) (see E102.9, C102.9, E205.1, E207.2, 405.1 Exception, 501.1 Exception 1, 504.2, 504.3, 504.4, 602.3.1). WCAG 2.0, published by the W3C Web Accessibility Initiative (W3C), specifies success criteria and requirements to make web content more accessible to all users, including persons with disabilities. The W3C website also provides online technical assistance materials linked to each success criteria and technical requirement. Availability: Copies of this standard may be obtained from the W3C Web Accessibility Initiative, Massachusetts Institute of Technology, 32 Vassar Street, Room 32-G515, Cambridge, MA 02139. Free copies of WCAG 2.0, and its related technical assistance materials, are available online at W3C's website (<http://www.w3.org/TR/WCAG20>).

List of Subjects

36 CFR Part 1193

Communications, Communications equipment, Individuals with disabilities, Reporting and recordkeeping requirements, Telecommunications.

36 CFR Part 1194

Civil rights, Communications, Communications equipment, Computer technology, Electronic products, Government employees, Government procurement, Individuals with disabilities, Reporting and recordkeeping requirements, Telecommunications.

David M. Capozzi,
Executive Director.

For the reasons stated in the preamble, under the authority of 47 U.S.C. 255(e), the Board proposes to amend 36 CFR chapter XI, as follows:

PART 1193 [REMOVED]

1. Remove part 1193.
2. Revise part 1194 to read as follows:

PART 1194 – INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) STANDARDS AND GUIDELINES

Sec.

1194.1 Standards for Section 508 of the Rehabilitation Act.

1194.2 Guidelines for Section 255 of the Communications Act.

Appendix A to Part 1194 – Section 508 of the Rehabilitation Act: Application and Scoping Requirements

Appendix B to Part 1194 – Section 255 of the Communications Act: Application and Scoping Requirements

Appendix C to Part 1194 – Technical Requirements

Authority: 29 U.S.C. 794d, 47 U.S.C. 255.

§1194.1 – Standards for Section 508 of the Rehabilitation Act.

The standards for information and communication technology developed, procured, maintained, or used by federal agencies covered by Section 508 of the Rehabilitation Act are set forth in Appendices A and C to this part.

§1194.2 – Guidelines for Section 255 of the Communications Act.

The guidelines for telecommunications equipment and customer premises equipment covered by Section 255 of the Communications Act are set forth in Appendices B and C to this part.

APPENDIX A TO PART 1194 – SECTION 508 OF THE REHABILITATION ACT: APPLICATION AND SCOPING REQUIREMENTS

508 CHAPTER 1: APPLICATION AND ADMINISTRATION

E101 General

E101.1 Purpose. These 508 Standards, which consist of 508 Chapters 1 and 2 (Appendix A), along with Chapters 3 through 6 (Appendix C), contain scoping and technical requirements for information and communication technology (ICT) that is accessible to and usable by individuals with disabilities. Compliance with these standards is mandatory for federal agencies subject to Section 508 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794d).

E101.2 Equivalent Facilitation. The use of an alternative design or technology that results in substantially equivalent or greater accessibility and usability by individuals with disabilities than would be provided by conformance to one or more of the requirements in Chapters 4 and 5 of the 508 Standards is permitted. The functional performance criteria in Chapter 3 shall be used to determine whether substantially equivalent or greater accessibility and usability is provided to individuals with disabilities.

E101.3 Conventional Industry Tolerances. Dimensions are subject to conventional industry tolerances except where dimensions are stated as a range.

E101.4 Units of Measurement. Measurements are stated in metric and U.S. customary units. The values stated in each system (metric and U.S. customary units) may not be exact equivalents, and each system shall be used independently of the other.

E102 Referenced Standards

E102.1 Incorporation by Reference. The specific editions of the standards and guidelines listed in E102 are incorporated by reference in the 508 Standards and are part of the requirements to the prescribed extent of each such reference. Where conflicts occur between the 508 Standards and the referenced standards, these standards apply. The Director of the Office of the Federal Register has approved the standards for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the referenced standards may be inspected at the Access Board's office, 1331 F Street, NW, Suite 1000, Washington, DC 20004.

E102.2 American National Standards Institute/ Human Factors and Ergonomics Society (ANSI/HFES). Copies of the referenced standard may be obtained from Human Factors and Ergonomics Society, P.O. Box 1369, Santa Monica, CA 90406-1369 (<http://www.hfes.org/Publications/ProductDetail.aspx?Id=76>). ANSI/HFES 200.2

Human Factors Engineering of Software User Interfaces — Part 2: Accessibility, (2008), IBR proposed for Section 502.4.

Advisory E102.2 American National Standards Institute/Human Factors and Ergonomics Society (ANSI/HFES). ANSI/HFES 200.2 provides design specifications for human-system software interfaces to ensure that software is accessible to people with a wide range of physical, sensory, and cognitive abilities, including those with temporary disabilities and older adults. This publication is also available as ISO 9241-171 Ergonomics of Human System Interaction, Part 171: Guidance on software accessibility.

E102.3 American National Standards Institute/ Institute of Electrical and Electronics Engineers (ANSI/IEEE). Copies of the referenced standard may be obtained from the Institute of Electrical and Electronics Engineers, 10662 Los Vaqueros Circle, P.O. Box 3014, Los Alamitos, CA 90720-1264 (<http://www.ieee.org>).

ANSI/IEEE C63.19-2011 American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids, Committee C63 – Electromagnetic Compatibility, May 27, 2011, IBR proposed for Section 410.4.1.

Advisory E102.3 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE). ANSI/IEEE C63.19-2011 provides a uniform method of measurement for compatibility between hearing aids and wireless communications devices.

E102.4 Advanced Television Systems Committee (ATSC). Copies of the referenced standard may be obtained from the Advanced Television Systems Committee, 1776 K Street NW, Suite 200, Washington, DC 20006-2304 (<http://www.atsc.org>).

A/53 Digital Television Standard, Part 5: AC-3 Audio System Characteristics, (2010), IBR proposed for Section 412.1.1.

Advisory E102.4 Advanced Television Systems Committee (ATSC). The A/53 Digital Television Standard provides the system characteristics for advanced television systems. The document and its normative parts provide detailed specification of the parameters of the system. Part 5 provides the audio system characteristics and normative specifications. It includes the Visually Impaired (VI) associated service, which is a complete program mix containing music, effects, dialogue and a narrative description of the picture content. ATSC also publishes a companion technical assistance guide to the use of its television standard.

E102.5 Internet Engineering Task Force (IETF). Copies of the referenced standard may be obtained from the Internet Engineering Task Force (<http://www.ietf.org>). Request for Comments (RFC) 4103, Real-time Transport Protocol (RTP) Payload for Text Conversation (2005), G. Hellstrom, Omnitor AB, and P. Jones, Cisco Systems, IBR proposed for Section 410.6.3.2.

Advisory E102.5 Internet Engineering Task Force (IETF). This standard describes how to carry real time text conversation session contents in Real-time Transport Protocol (RTP) packets. Real time text conversation is used alone or in connection with other conversational modalities to form multimedia conversation services. Examples of other conversational modalities are video and voice. Real time text in multimedia conversation sessions is sent character-by-character as soon as it is available, or with a small delay for buffering.

E102.6 International Standards Organization (ISO). Copies of the referenced standards may be obtained from International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56 - CH-1211 Geneva 20, Switzerland (http://www.iso.org/iso/catalogue_detail.htm?csnumber=54564).

ISO 14289-1 Document management applications — Electronic document file format enhancement for accessibility — Part 1: Use of ISO 32000-1 (PDF/UA-1), Technical Committee ISO/TC 171, Document Management Applications, Subcommittee SC 2, Application Issues, (2014), IBR proposed for Sections E205.1 and 602.3.1.

Advisory E102.6 International Standards Organization (ISO). Formally known as ISO 14289-1:2014, PDF/UA-1 (Portable Document Format, Universal Accessibility), this is the International Standard for accessible PDF. PDF/UA provides a technical, interoperable standard for the authoring, remediation and validation of PDF content to ensure accessibility for people with disabilities who use assistive technology such as screen readers, screen magnifiers, and joysticks to navigate and read electronic content.

E102.7 International Telecommunications Union Telecommunications Standardization Sector (ITU-T). Copies of the referenced standards may be obtained from the International Telecommunication Union, Telecommunications Standardization Sector, Place des Nations CH-1211, Geneva 20, Switzerland (<http://www.itu.int/en/ITU-T>).

E102.7.1 ITU-T Recommendation G.722: General Aspects of Digital Transmission Systems, Terminal Components, 7 kHz Audio-Coding within 64 Kbits/s, (September 2012), IBR proposed for Section 410.5.

E102.7.2 ITU-T Recommendation E.161: Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network, ITU – T Study Group 2, (February 2001), IBR proposed for Section 407.3.2.

Advisory E102.7 International Telecommunications Union Telecommunications Standardization Sector (ITU-T). G.722 is an ITU-T standard describing how to encode and compress wideband audio and decode it for playback. The G.722 coder-decoder program provides 7 kHz wideband audio at data rates from 48, 56, and 64 kbits/s. It is useful for voice over IP applications, where it provides high quality audio for video conferencing and PC-to-PC calls placed via VoIP services. E.161 defines the assignment of the basic 26 Latin letters (A to Z) to the 12-key telephone keypad.

E102.8 Telecommunications Industry Association (TIA). Copies of the referenced standards, published by the Telecommunications Industry Association, may be obtained from IHS, 15 Inverness Way East, Englewood, CO 80112 (<http://global.ihs.com>).

E102.8.1 TIA 825-A A Frequency Shift Keyed Modem for Use on the Public Switched Telephone Network, (2003), IBR proposed for Section 410.6.3.1.

E102.8.2 TIA 1083 Telephone Terminal Equipment Handset Magnetic Measurement Procedures and Performance Requirements, (March 2007), IBR proposed for Section 410.4.2.

Advisory E102.8 Telecommunications Industry Association (TIA). TIA 825-A is the standard for TTY signals on the public switched telephone network interface (PSTN). TIA 1083 defines measurement procedures and performance requirements for the handset generated audio band magnetic noise of wire line telephones, including digital cordless telephones.

E102.9 Worldwide Web Consortium (W3C). Copies of the referenced guidelines may be obtained from the W3C Web Accessibility Initiative, Massachusetts Institute of Technology, 32 Vassar Street, Room 32-G515, Cambridge, MA 02139 (<http://www.w3.org/TR/WCAG20>).

Web Content Accessibility Guidelines (WCAG) 2.0, W3C Recommendation, December 2008, IBR proposed for Sections E205.1, E207.2, 405.1 Exception, 501.1 Exception 1, 504.2, 504.3, 504.4, and 602.3.1.

Advisory E102.9 Worldwide Web Consortium (W3C). Web Content Accessibility Guidelines (WCAG) 2.0 offers a series of recommendations to make web content more accessible to all users, including persons with disabilities.

E103 Definitions

E103.1 Terms Defined in Referenced Standards. Terms defined in referenced standards and not defined in E103.4 shall have the meaning as defined in the referenced standards.

E103.2 Undefined Terms. Any term not defined in E103.4 or in referenced standards shall be given its ordinarily accepted meaning in the sense that the context implies.

E103.3 Interchangeability. Words, terms, and phrases used in the singular include the plural and those used in the plural include the singular.

E103.4 Defined Terms. For the purpose of the 508 Standards, the terms defined in E103.4 have the indicated meaning.

508 Standards. The standards for ICT developed, procured, maintained, or used by agencies subject to Section 508 of the Rehabilitation Act as set forth in 508 Chapters 1 and 2 (36 CFR Part 1194, Appendix A), and Chapters 3 through 6 (36 CFR Part 1194, Appendix C).

Agency. Any agency or department of the United States as defined in 44 U.S.C. 3502, and the United States Postal Service.

Application. Software designed to perform, or to help the user to perform, a specific task or tasks.

Assistive Technology (AT). Any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.

Audio Description. Narration added to the soundtrack to describe important visual details that cannot be understood from the main soundtrack alone. Audio description is a means to inform individuals who are blind or who have low vision about visual content essential for comprehension. Audio description of video provides information about actions, characters, scene changes, on-screen text, and other visual content. Audio description supplements the regular audio track of a program. Audio description is usually added during existing pauses in dialogue. Audio description is also called “video description” and “descriptive narration”.

Authoring Tool. Any software, or collection of software components, that can be used by authors, alone or collaboratively, to create or modify content for use by others, including other authors.

Closed Functionality. Characteristics that limit functionality or prevent a user from attaching or installing assistive technology. Examples of ICT with closed functionality are self-service machines, information kiosks, set-top boxes, fax machines, calculators, and computers that are locked down so that users may not adjust settings due to a policy such as Desktop Core Configuration.

Content. Electronic information and data, as well as the encoding that defines its structure, presentation, and interactions.

Hardware. A tangible device, equipment, or physical component of ICT, such as telephones, computers, multifunction copy machines, and keyboards.

Information technology. Shall have the same meaning as the term “information technology” set forth in 40 U.S.C. 11101(6).

Information and Communication Technology (ICT). Information technology and other equipment, systems, technologies, or processes, for which the principal function is the creation, manipulation, storage, display, receipt, or transmission of electronic data and information, as well as any associated content. Examples of ICT include, but are not limited to: computers and peripheral equipment; information kiosks and transaction machines; telecommunications equipment; customer premises equipment; multifunction office machines; software; applications; websites; videos; and, electronic documents.

Keyboard. A set of systematically arranged alphanumeric keys or a control that generates alphanumeric input by which a machine or device is operated. A keyboard includes tactilely discernible keys used in conjunction with the alphanumeric keys if their function maps to keys on the keyboard interfaces.

Label. Text, or a component with a text alternative, that is presented to a user to identify content. A label is presented to all users, whereas a name may be hidden and only exposed by assistive technology. In many cases, the name and the label are the same.

Menu. A set of selectable options.

Name. Text by which software can identify a component to the user. A name may be hidden and only exposed by assistive technology, whereas a label is presented to all users. In many cases, the label and the name are the same. Name is unrelated to the name attribute in HTML.

Operable Part. A component of ICT used to activate, deactivate, or adjust the ICT.

Platform Accessibility Services. Services provided by a platform enabling interoperability with assistive technology. Examples are Application Programming Interfaces (API) and the Document Object Model (DOM).

Platform Software. Software that interacts with hardware, or provides services for other software. Platform software may run or host other software, and may isolate them from underlying software or hardware layers. A single software component may have both platform and non-platform aspects. Examples of platforms are: desktop operating systems; embedded operating systems, including mobile systems; Web browsers; plug-ins to Web browsers that render a particular media or format; and sets of components that allow other applications to execute, such as applications which support macros or scripting.

Programmatically Determinable. Ability to be determined by software from author-supplied data that is provided in a way that different user agents, including assistive technologies, can extract and present the information to users in different modalities.

Public Facing. Content made available by an agency to members of the general public. Examples include, but are not limited to, an agency website, blog post, or social media pages.

Real-Time Text (RTT). Communications using the transmission of text by which characters are transmitted by a terminal as they are typed. Real-time text is used for conversational purposes. Real-time text also may be used in voicemail, interactive voice response systems, and other similar applications.

Software. Programs, procedures, rules and related data and documentation that direct the use and operation of ICT and instruct it to perform a given task or function.

Telecommunications. The signal transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.

Terminal. Device or software with which the end user directly interacts and that provides the user interface. For some systems, the software that provides the user interface may reside on more than one device such as a telephone and a server.

Text. A sequence of characters that can be programmatically determined and that expresses something in human language.

TTY. Equipment that enables interactive text based communications through the transmission of frequency-shift-keying audio tones across the public switched telephone network. TTYs include devices for real-time text communications and voice and text intermixed communications. Examples of intermixed communications are voice carry over and hearing carry over. One example of a TTY is a computer with TTY emulating software and modem.

Voice over Internet Protocol (VoIP). A technology that provides real-time voice communications. VoIP requires a broadband connection from the user's location and customer premises equipment compatible with Internet protocol.

508 CHAPTER 2: SCOPING REQUIREMENTS

E201 Application

E201.1 Scope. ICT that is procured, developed, maintained, or used by agencies shall conform to the 508 Standards.

Advisory E201.1 Scope. Section 508 of the Rehabilitation Act (29 U.S.C. 794d) applies to federal departments and agencies, including the U.S. Postal Service. The term “agency” is defined in Section E103 to include the United States Postal Service and other federal agencies and departments as specified in 44 U.S.C. 3502. That section of the U.S.C. defines “agency” to mean any executive department, military department, Government corporation, Government controlled corporation, or other establishment in the executive branch of the Government (including the Executive Office of the President), or any independent regulatory agency, but does not include (a) the General Accounting Office; (b) Federal Election Commission; (c) the governments of the District of Columbia and of the territories and possessions of the United States, and their various subdivisions; or (d) Government-owned contractor-operated facilities, including laboratories engaged in national defense research and production activities.

E202 General Exceptions

E202.1 General. ICT shall be exempt from compliance with the 508 Standards to the extent specified by E202.

E202.2 National Security Systems. The 508 standards do not apply to ICT operated by agencies as part of a national security system, as defined by 40 U.S.C. 11103(a).

Advisory E202.2 National Security Systems. The term National Security System means any telecommunication, or information system operated by the United States government, the function, operation, or use of which involves: intelligence activities; cryptologic activities related to national security; command and control of military forces; equipment that is an integral part of a weapon or weapons system; or systems which are critical to the direct fulfillment of military or intelligence missions. Systems that are critical to the direct fulfillment of military or intelligence missions do not include systems that are used for routine administrative and business applications. Examples of routine administrative and business applications are payroll, finance, logistics, and personnel management applications. Routine administrative and business applications are covered by this document.

E202.3 Federal Contracts. ICT acquired by a contractor incidental to a contract shall not be required to conform to the 508 Standards.

Advisory E202.3 Federal Contracts. ICT that is incidental to a contract includes materials which are, themselves, not deliverables under the contract. For example, if a contractor is permitted to use money from a contract to acquire a laptop which is used to help create the deliverable for the project, the laptop, itself, is considered incidental to the contract since it is not part of the deliverable.

E202.4 ICT Functions Located in Maintenance or Monitoring Spaces. Where status indicators and operable parts for ICT functions are located in spaces that are frequented only by service personnel for maintenance, repair, or occasional monitoring of equipment, such status indicators and operable parts shall not be required to conform to the 508 Standards.

Advisory E202.4 Functions Located in Maintenance or Monitoring Spaces. When indicators and operable parts for ICT functions are located in maintenance or monitoring spaces but they are operated remotely, the remote controls or interfaces would also not be permitted this exception unless they are also located in a maintenance or monitoring space.

E202.5 Undue Burden or Fundamental Alteration. Where an agency determines in accordance with E202.5 that conformance to requirements in the 508 Standards would impose an undue burden or would result in a fundamental alteration in the nature of the ICT, conformance shall be required only to the extent that it does not impose an undue burden or result in a fundamental alteration in the nature of the ICT.

E202.5.1 Basis for a Determination of Undue Burden. In determining whether conformance to requirements in the 508 Standards would impose an undue burden on the agency, the agency shall consider the extent to which conformance would impose significant difficulty or expense considering the agency resources available to the program or component for which the ICT is to be procured, developed, maintained, or used.

E202.5.2 Required Documentation. The responsible agency official shall document in writing the basis for determining that conformance to requirements in the 508 Standards constitute an undue burden on the agency, or would result in a fundamental alteration in the nature of the ICT. The documentation shall include an explanation of why and to what extent compliance with applicable requirements would create an undue burden or result in a fundamental alteration in the nature of the ICT.

E202.5.3 Alternative Means. Where conformance to one or more requirements in the 508 Standards imposes an undue burden or a fundamental alteration in the nature of the ICT, the agency shall provide individuals with disabilities access to and use of information and data by an alternative means that meets identified needs.

Advisory E202.5 Undue Burden or Fundamental Alteration. A determination by an agency that conformance to a particular provision would result in an undue burden or a fundamental alteration in the nature of the ICT does not exempt the ICT in its entirety. The agency is required to ensure conformance of ICT to those provisions that do not result in an undue burden or a fundamental alteration in the nature of the ICT.

E202.6 Best Meets. Where ICT conforming to one or more requirements in the 508 Standards is not commercially available, the agency shall procure the product that best meets the 508 Standards consistent with the agency's business needs.

Advisory E202.6 Best Meets. This exception only applies when a product meeting the provisions of this document is not commercially available. This document does not require agencies to procure ICT that is not needed by the agencies to perform their mission.

E202.6.1 Required Documentation. The responsible agency official shall document in writing: (a) the nonavailability of conforming ICT, including a description of market research performed and which provisions cannot be met, and (b) the basis for determining that the ICT to be procured best meets the requirements in the 508 Standards consistent with the agency's business needs.

Advisory E202.6.1 Required Documentation. The Federal Acquisition Regulation (FAR) sets forth the documentation requirements for a determination of commercial non-availability by federal agencies subject to 508 requirements.

E202.6.2 Alternative Means. Where ICT that fully conforms to the 508 Standards is not commercially available, the agency shall provide individuals with disabilities access to and use of information and data by an alternative means that meets identified needs.

Advisory E202.6.2 Alternative Means. Nothing in this document obviates or limits the requirements of other sections of the Rehabilitation Act of 1973, as amended. An agency still may still have a duty under Sections 501 and 504 to provide access to information and data to individuals with disabilities. Some individuals may require accommodations even when using ICT that fully conforms to the provisions of this document.

E203 Access to Functionality

E203.1 General. Agencies shall ensure that all functionality of ICT is accessible to and usable by individuals with disabilities, either directly or by supporting the use of assistive technology, and shall comply with E203. In providing access to all functionality of ICT, agencies shall ensure the following:

- a. That federal employees with disabilities have access to and use of information and data that is comparable to the access and use by federal employees who are not individuals with disabilities; and

b. That members of the public with disabilities who are seeking information or data from a federal agency have access to and use of information and data that is comparable to that provided to members of the public who are not individuals with disabilities.

E203.2 Agency Business Needs. When agencies procure, develop, maintain or use ICT they shall identify the business needs of users with disabilities affecting vision, hearing, color perception, speech, dexterity, strength, or reach to determine:

- a. How users with disabilities will perform the functions supported by the ICT; and
- b. How the ICT will be installed, configured, and maintained to support users with disabilities.

Advisory E203.2 Agency Business Needs. An assistive technology needs assessment is an example of how an agency might analyze how a user performs the functions supported by the ICT. Set-up of assistive technology is an example of installation and configuration to support use by people with disabilities. User training is an example of a resource that helps maintain the ability of users with disabilities to use ICT.

E204 Functional Performance Criteria

E204.1 General. Where the requirements in Chapters 4 and 5 do not address one or more features of ICT, the features not addressed shall conform to the Functional Performance Criteria specified in Chapter 3.

E205 Content

E205.1 General. Content shall comply with E205.

E205.2 Public Facing. Content that is public facing shall conform to the accessibility requirements specified in E205.4.

E205.3 Agency Official Communication. Content that is not public facing shall conform to the accessibility requirements specified in E205.4 when such content constitutes official business, and is communicated by an agency through one or more of the following:

- 1. An emergency notification;
- 2. An initial or final decision adjudicating an administrative claim or proceeding;
- 3. An internal or external program or policy announcement;
- 4. A notice of benefits, program eligibility, employment opportunity, or personnel action;
- 5. A formal acknowledgement or receipt;
- 6. A questionnaire or survey;
- 7. A template or form; or
- 8. Educational or training materials.

EXCEPTION: Records maintained by the National Archives and Records Administration (NARA) pursuant to federal recordkeeping statutes shall not be required to conform to the 508 Standards unless public facing.

Advisory E205.3 Agency Official Communication - Exception. Materials submitted to NARA as public records are not required to conform to the provisions of this document even if they are of a type listed in E205.3. However, all agencies are encouraged to do what they can to preserve aspects of documents that contribute to their accessibility, such as structure and formatting.

E205.4 Accessibility Standards. Content shall conform to Level A and Level AA Success Criteria and Conformance Requirements specified for Web pages in WCAG 2.0 (incorporated by reference in Chapter 1) or, where applicable, ISO 14289-1 (PDF/UA-1) (incorporated by reference in Chapter 1).

E206 Hardware

E206.1 General. Where components of ICT are hardware and transmit information or have a user interface, such components shall conform to applicable requirements in Chapter 4.

E207 Software

E207.1 General. Where components of ICT are software and transmit information or have a user interface, such components shall conform to E207 and applicable requirements in Chapter 5.

E207.2 WCAG Conformance. User interface components, as well as the content of platforms and applications, shall conform to Level A and Level AA Success Criteria and Conformance Requirements specified for Web pages in WCAG 2.0 (incorporated by reference in Chapter 1).

Advisory E207.2 WCAG Conformance. WCAG is written to be technology neutral. While oriented towards web pages which are defined as being delivered using HTTP, the WCAG 2.0 Success Criteria and Conformance Requirements can be applied to non-web documents, user interface components, and the content of platforms and applications. Guidance can be found at: <http://www.w3.org/TR/wcag2ict>.

E208 Support Documentation and Services

E208.1 General. Where an agency provides support documentation or services for ICT, such documentation and services shall conform to the requirements in Chapter 6.

APPENDIX B TO PART 1194 – SECTION 255 OF THE COMMUNICATIONS ACT: APPLICATION AND SCOPING REQUIREMENTS

255 CHAPTER 1: APPLICATION AND ADMINISTRATION

C101 General

C101.1 Purpose. These 255 Guidelines, which consist of 255 Chapters 1 and 2 (Appendix B), along with Chapters 3 through 6 (Appendix C), contain scoping and technical requirements for the design, development, and fabrication of telecommunications equipment and customer premises equipment, and related software, content, and support documentation and services, to ensure their accessibility to and usability by individuals with disabilities. These 255 Guidelines are to be applied to the extent required by regulations issued by the Federal Communications Commission under Section 255 of the Communications Act of 1934, as amended (47 U.S.C. 255).

C101.2 Equivalent Facilitation. The use of an alternative design or technology that results in substantially equivalent or greater accessibility and usability by individuals with disabilities than would be provided by conformance to one or more of the requirements in Chapters 4 and 5 of the 255 Guidelines is permitted. The functional performance criteria in Chapter 3 shall be used to determine whether substantially equivalent or greater accessibility and usability is provided to individuals with disabilities.

C101.3 Conventional Industry Tolerances. Dimensions are subject to conventional industry tolerances except where dimensions are stated as a range.

C101.4 Units of Measurement. Measurements are stated in metric and U.S. customary units. The values stated in each system (metric and U.S. customary units) may not be exact equivalents, and each system shall be used independently of the other.

C102 Referenced Standards

C102.1 Incorporation by Reference. The specific editions of the standards and guidelines listed in C102 are incorporated by reference in the 255 Guidelines and are part of the requirements to the prescribed extent of each such reference. Where conflicts occur between the 255 Guidelines and the referenced standards, these guidelines apply. The Director of the Office of Federal Register has approved the standards for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the referenced standards may be inspected at the Access Board's office, 1331 F Street, NW, Suite 1000, Washington, DC 20004.

C102.2 American National Standards Institute/ Human Factors and Ergonomics Society (ANSI/HFES). Copies of the referenced standard may be obtained from Human

Factors and Ergonomics Society, P.O. Box 1369, Santa Monica, CA 90406-1369 (<http://www.hfes.org/Publications/ProductDetail.aspx?Id=76>).

ANSI/HFES 200.2 Human Factors Engineering of Software User Interfaces — Part 2: Accessibility, (2008), IBR proposed for Section 502.4.

Advisory C102.2 American National Standards Institute/Human Factors and Ergonomics Society (ANSI/HFES). ANSI/HFES 200.2 provides design specifications for human-system software interfaces to ensure that software is accessible to people with a wide range of physical, sensory, and cognitive abilities, including those with temporary disabilities and older adults. This publication is also available as ISO 9241-171 Ergonomics of Human System Interaction, Part 171: Guidance on software accessibility.

C102.3 American National Standards Institute/ Institute of Electrical and Electronics Engineers (ANSI/IEEE). Copies of the referenced standard may be obtained from the Institute of Electrical and Electronics Engineers, 10662 Los Vaqueros Circle, P.O. Box 3014, Los Alamitos, CA 90720-1264 (<http://www.ieee.org>).

ANSI/IEEE C63.19-2011 American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids, Committee C63 – Electromagnetic Compatibility, May 27, 2011, IBR proposed for Section 410.4.1.

Advisory C102.3 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE). ANSI/IEEE C63.19-2011 provides a uniform method of measurement for compatibility between hearing aids and wireless communications devices.

C102.4 Advanced Television Systems Committee (ATSC). Copies of the referenced standard may be obtained from the Advanced Television Systems Committee, 1776 K Street NW, Suite 200, Washington, DC 20006-2304 (<http://www.atsc.org>).

A/53 Digital Television Standard, Part 5: AC-3 Audio System Characteristics, (2010), IBR proposed for Section 412.1.1.

Advisory C102.4 Advanced Television Systems Committee (ATSC). The A/53 Digital Television Standard provides the system characteristics for advanced television systems. The document and its normative parts provide detailed specification of the parameters of the system. Part 5 provides the audio system characteristics and normative specifications. It includes the Visually Impaired (VI) associated service, which is a complete program mix containing music, effects, dialogue and a narrative description of the picture content. ATSC also publishes a companion technical assistance guide to the use of its television standard.

C102.5 IETF. Internet Engineering Task Force (IETF). Copies of the referenced standard may be obtained from the Internet Engineering Task Force (<http://www.ietf.org>). Request for Comments (RFC) 4103, Real-time Transport

Protocol (RTP) Payload for Text Conversation (2005), G. Hellstrom, Omnitor AB, and P. Jones, Cisco Systems, IBR proposed for Section 410.6.3.2.

Advisory C102.5 Internet Engineering Task Force (IETF). This standard describes how to carry real time text conversation session contents in Real-time Transport Protocol (RTP) packets. Real time text conversation is used alone or in connection with other conversational modalities to form multimedia conversation services. Examples of other conversational modalities are video and voice. Real time text in multimedia conversation sessions is sent character-by-character as soon as it is available, or with a small delay for buffering.

C102.6 International Standards Organization (ISO). Copies of the referenced standards, may be obtained from International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56 - CH-1211 Geneva 20, Switzerland (http://www.iso.org/iso/catalogue_detail.htm?csnumber=54564).

ISO 14289-1 Document management applications — Electronic document file format enhancement for accessibility — Part 1: Use of ISO 32000-1 (PDF/UA-1), Technical Committee ISO/TC 171, Document Management Applications, Subcommittee SC 2, Application Issues, (2014), IBR proposed for Sections E205.1 and 602.3.1.

Advisory C102.6 International Standards Organization (ISO). Formally known as ISO 14289-1:2014, PDF/UA-1 (Portable Document Format, Universal Accessibility), this is the International Standard for accessible PDF. PDF/UA provides a technical, interoperable standard for the authoring, remediation and validation of PDF content to ensure accessibility for people with disabilities who use assistive technology such as screen readers, screen magnifiers, and joysticks to navigate and read electronic content.

C102.7 International Telecommunications Union Telecommunications Standardization Sector (ITU-T). Copies of the referenced standards may be obtained from the International Telecommunication Union, Telecommunications Standardization Sector, Place des Nations CH-1211, Geneva 20, Switzerland (<http://www.itu.int/en/ITU-T>).

C102.7.1 ITU-T Recommendation G.722: General Aspects of Digital Transmission Systems, Terminal Components, 7 kHz Audio-Coding within 64 Kbits/s, (September 2012), IBR proposed for Section 410.5.

C102.7.2 ITU-T Recommendation E.161: Arrangement of digits, letters and symbols on telephones and other devices that can be used for gaining access to a telephone network, ITU – T Study Group 2, (February 2001), IBR proposed for Section 407.3.2.

Advisory C102.7 International Telecommunications Union Telecommunications Standardization Sector (ITU-T). G.722 is an ITU-T standard describing how to encode and compress wideband audio and decode it for playback. The G.722 coder-decoder program provides 7 kHz wideband audio at data rates from 48, 56, and 64 kbits/s. It is useful for voice over IP applications, where it provides high quality audio for video conferencing and PC-to-PC calls placed via VoIP services. E.161 defines the assignment of the basic 26 Latin letters (A to Z) to the 12-key telephone keypad.

C102.8 Telecommunications Industry Association (TIA). Copies of the referenced standards, published by the Telecommunications Industry Association, may be obtained from IHS, 15 Inverness Way East, Englewood, CO 80112 (<http://global.ihs.com>).

C102.8.1 TIA 825-A A Frequency Shift Keyed Modem for Use on the Public Switched Telephone Network, (2003), IBR proposed for Section 410.6.3.1.

C102.8.2 TIA 1083 Telephone Terminal Equipment Handset Magnetic Measurement Procedures and Performance Requirements, (March 2007), IBR proposed for Section 410.4.2.

Advisory E102.8 Telecommunications Industry Association (TIA). TIA 825-A is the standard for TTY signals on the public switched telephone network interface (PSTN). TIA 1083 defines measurement procedures and performance requirements for the handset generated audio band magnetic noise of wire line telephones, including digital cordless telephones.

C102.9 Worldwide Web Consortium (W3C). Copies of the referenced guidelines may be obtained from the W3C Web Accessibility Initiative, Massachusetts Institute of Technology, 32 Vassar Street, Room 32-G515, Cambridge, MA 02139 (<http://www.w3.org/TR/WCAG20>).

Web Content Accessibility Guidelines (WCAG) 2.0, W3C Recommendation, December 2008, IBR proposed for Sections E205.1, E207.2, 405.1 Exception, 501.1 Exception 1, 504.2, 504.3, 504.4, and 602.3.1.

Advisory C102.9 Worldwide Web Consortium (W3C). Web Content Accessibility Guidelines (WCAG) 2.0 offers a series of recommendations to make web content more accessible to all users, including persons with disabilities.

C103 Definitions

C103.1 Terms Defined in Referenced Standards. Terms defined in referenced standards and not defined in C103.4 shall have the meaning as defined in the referenced standards.

C103.2 Undefined Terms. Any term not defined in C103.4 or in referenced standards shall be given its ordinarily accepted meaning in the sense that the context implies.

C103.3 Interchangeability. Words, terms, and phrases used in the singular include the plural and those used in the plural include the singular.

C103.4 Defined Terms. For the purpose of the 255 Guidelines, the terms defined in C103.4 have the indicated meaning.

255 Guidelines. The guidelines for telecommunications equipment and customer premises equipment covered by Section 255 of the Communications Act as set forth in 255 Chapters 1 and 2 (36 CFR Part 1194, Appendix B), and Chapters 3 through 6 (36 CFR Part 1193, Appendix C).

Application. Software designed to perform, or to help the user perform, a specific task or tasks.

Assistive Technology (AT). Any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.

Audio Description. Narration added to the soundtrack to describe important visual details that cannot be understood from the main soundtrack alone. Audio description is a means to inform individuals who are blind or who have low vision about visual content essential for comprehension. Audio description of video provides information about actions, characters, scene changes, on-screen text, and other visual content. Audio description supplements the regular audio track of a program. Audio description is usually added during existing pauses in dialogue. Audio description is also called “video description” and “descriptive narration.”

Authoring Tool. Any software, or collection of software components, that can be used by authors, alone or collaboratively, to create or modify content for use by others, including other authors.

Closed Functionality. Characteristics that limit functionality or prevent a user from attaching or installing assistive technology. Examples of ICT with closed functionality are self-service machines, information kiosks, set-top boxes, fax machines, calculators, and computers that are locked down so that users may not adjust settings due to a policy such as Desktop Core Configuration.

Content. Electronic information and data, as well as the encoding that defines its structure, presentation, and interactions.

Customer Premises Equipment (CPE). Equipment used on the premises of a person (other than a carrier) to originate, route, or terminate telecommunications or interconnected VoIP service. Examples of CPE are telephones, routers, switches, residential gateways, set-top boxes, fixed mobile convergence products, home networking adaptors and Internet access gateways which enable consumers to access communications service providers’ services and distribute them around their house via a Local Access Network (LAN).

Hardware. A tangible device, equipment, or physical component of ICT, such as telephones, computers, multifunction copy machines, and keyboards.

Information and Communication Technology (ICT). Information technology and other equipment, systems, technologies, or processes, for which the principal function is the creation, manipulation, storage, display, receipt, or transmission of electronic data and information, as well as any associated content. Examples of ICT include, but are not limited to: computers and peripheral equipment; information kiosks and transaction machines; telecommunications equipment; customer premises equipment; multifunction office machines; software; applications; websites; videos; and, electronic documents.

Keyboard. A set of systematically arranged alphanumeric keys or a control that generates alphanumeric input by which a machine or device is operated. A keyboard includes tactilely discernible keys used in conjunction with the alphanumeric keys if their function maps to keys on the keyboard interfaces.

Label. Text, or a component with a text alternative, that is presented to a user to identify content. A label is presented to all users, whereas a name may be hidden and only exposed by assistive technology. In many cases, the name and the label are the same.

Menu. A set of selectable options.

Name. Text by which software can identify a component to the user. A name may be hidden and only exposed by assistive technology, whereas a label is presented to all users. In many cases, the label and the name are the same. Name is unrelated to the name attribute in HTML.

Operable Part. A component of ICT used to activate, deactivate, or adjust the ICT.

Platform Accessibility Services. Services provided by a platform enabling interoperability with assistive technology. Examples are Application Programming Interfaces (API) and the Document Object Model (DOM).

Platform Software. Software that interacts with hardware, or provides services for other software. Platform software may run or host other software, and may isolate them from underlying software or hardware layers. A single software component may have both platform and non-platform aspects. Examples of platforms are: desktop operating systems; embedded operating systems, including mobile systems; Web browsers; plug-ins to Web browsers that render a particular media or format; and sets of components that allow other applications to execute, such as applications which support macros or scripting.

Programmatically Determinable. Ability to be determined by software from author-supplied data that is provided in a way that different user agents, including assistive technologies, can extract and present the information to users in different modalities.

Real-Time Text (RTT). Communications using the transmission of text by which characters are transmitted by a terminal as they are typed. Real-time text is used for conversational purposes. Real-time text also may be used in voicemail, interactive voice response systems, and other similar applications.

Software. Programs, procedures, rules and related data and documentation that direct the use and operation of ICT and instruct it to perform a given task or function. *Specialized Customer Premises Equipment.* Assistive technology used by individuals with disabilities to originate, route, or terminate telecommunications or interconnected VoIP service. Examples are TTYs and amplified telephones.

Telecommunications. The signal transmission between or among points specified by the user of information and of the user's choosing without change in the form or content of the information as sent and received.

Telecommunications Equipment. Equipment, other than customer premises equipment, used by a carrier to provide telecommunications services, and includes software integral to such equipment (including upgrades).

Telecommunications Equipment Manufacturer. A manufacturer of ICT that is telecommunications equipment or customer premises equipment.

Terminal. Device or software with which the end user directly interacts and that provides the user interface. For some systems, the software that provides the user interface may reside on more than one device such as a telephone and a server.

Text. A sequence of characters that can be programmatically determined and that expresses something in human language.

TTY. Equipment that enables interactive text based communications through the transmission of frequency-shift-keying audio tones across the public switched telephone network. TTYs include devices for real-time text communications and voice and text intermixed communications. Examples of intermixed communications are voice carry over and hearing carry over. One example of a TTY is a computer with TTY emulating software and modem.

Voice over Internet Protocol (VoIP). A technology that provides real-time voice communications. VoIP requires a broadband connection from the user's location and customer premises equipment compatible with Internet protocol.

255 CHAPTER 2: SCOPING REQUIREMENTS

C201 Application

C201.1 Scope. Manufacturers of telecommunications equipment shall comply with the requirements in the 255 Guidelines applicable to such equipment when newly released, upgraded, or substantially changed from an earlier version or model. Manufacturers of telecommunications equipment shall also conform to the requirements in the 255 Guidelines for software, content, and support documentation and services where associated with the use of such equipment.

Advisory C201.1 Scope. Existing telecommunications equipment that undergoes minor changes that do not affect functionality is not required to conform to the provisions of these guidelines.

C201.2. Readily Achievable. When a telecommunications equipment manufacturer determines that conformance to one or more requirements in Chapter 4 (Hardware) or Chapter 5 (Software) would not be readily achievable, it shall ensure that the equipment or software is compatible with existing peripheral devices or specialized customer premises equipment commonly used by individuals with disabilities to the extent readily achievable.

Advisory C201.2 Readily Achievable. A determination by a telecommunications equipment manufacturer that it is not readily achievable for ICT to conform to a certain provision does not exempt the ICT in its entirety from coverage under these guidelines. ICT must conform to those provisions that are readily achievable.

In determining whether compliance is readily achievable, telecommunications manufacturers should consider the following factors: the nature and cost of the action needed to provide accessibility or compatibility; the overall resources of the telecommunications manufacturer, including financial resources, technical expertise, component supply sources, equipment, or personnel; the overall financial resources of any parent corporation or entity, to the extent such resources are available to the telecommunications manufacturer; and, whether the accessibility solution results in a fundamental alteration in the nature of the product.

C201.3 Access to Functionality. Telecommunications equipment manufacturers shall ensure that ICT is accessible to and usable by individuals with disabilities by providing direct access to all functionality of ICT. Where telecommunications equipment manufacturers can demonstrate that it is not readily achievable for ICT to provide direct access to all functionality, ICT shall support the use of assistive technology and specialized customer premises equipment where readily achievable.

Advisory C201.3 Access to Functionality. Built-in direct access to functionality is required when readily achievable. Otherwise, compatibility with assistive technology and specialized customer premises equipment is required when readily achievable.

C201.4 Prohibited Reduction of Accessibility, Usability, and Compatibility. No change shall be undertaken that decreases, or has the effect of decreasing, the net accessibility, usability, or compatibility of ICT.

EXCEPTION: Discontinuation of a product shall not be prohibited.

C201.5 Design, Development, and Fabrication. Telecommunications equipment manufacturers shall evaluate the accessibility, usability, and interoperability of ICT during its product design, development, and fabrication.

Advisory C201.5 Design, Development, and Fabrication. Conducting market research, and holding product design testing and trials that include individuals with disabilities, are examples of ways to meet this requirement.

C202 Functional Performance Criteria

C202.1 General. Where the requirements in Chapters 4 and 5 do not address one or more features of ICT, the features not addressed shall conform to the Functional Performance Criteria specified in Chapter 3.

C203 Electronic Content

C203.1 General. Regardless of the medium or the method of transmission and storage, electronic content integral to the use of ICT shall conform to Level A and Level AA Success Criteria and Conformance Requirements specified for Web pages in WCAG 2.0 (incorporated by reference in Chapter 1) or ISO 14289-1 (PDF/UA-1) (incorporated by reference in Chapter 1).

Advisory C203.1 General. WCAG is written to be technology neutral. While oriented towards web pages which are defined as being delivered using HTTP, the WCAG 2.0 Success Criteria and Conformance Requirements can be applied to all electronic content. Guidance can be found at <http://www.w3.org/TR/wcag2ict>.

C204 Hardware

C204.1 General. Where components of ICT are hardware, and transmit information or have a user interface, those components shall conform to applicable requirements in Chapter 4.

EXCEPTION: Components of ICT shall not be required to conform to 402, 407.11, 407.12, 408, and 409.

C205 Software

C205.1 General. Where components of ICT are software and transmit information or have a user interface, those components shall conform to C205 and applicable requirements in Chapter 5.

C205.2 WCAG Conformance. User interface components and content of platforms and applications shall conform to Level A and Level AA Success Criteria and Conformance Requirements specified for Web pages in WCAG 2.0 (incorporated by reference in Chapter 1).

Advisory C205.2 WCAG Conformance. WCAG is written to be technology neutral. While oriented towards web pages which are defined as being delivered using HTTP, the WCAG 2.0 Success Criteria and Conformance Requirements can be applied to non-web documents, user interface components, and the content of platforms and applications. Guidance can be found at: <http://www.w3.org/TR/wcag2ict>.

C206 Support Documentation and Services

C206.1 General. Where support documentation and services are provided for ICT, telecommunications equipment manufacturers shall provide such documentation and services in conformance with Chapter 6, upon request and at no additional charge.

APPENDIX C TO PART 1194 – FUNCTIONAL PERFORMANCE CRITERIA AND TECHNICAL REQUIREMENTS

CHAPTER 3: FUNCTIONAL PERFORMANCE CRITERIA

301 General

301.1 Scope. The requirements of Chapter 3 shall apply to ICT where required by 508 Chapter 2 (Scoping Requirements), 255 Chapter 2 (Scoping Requirements), and where otherwise referenced in any other chapter of the 508 Standards or 255 Guidelines.

302 Functional Performance Criteria

302.1 Without Vision. Where a visual mode of operation is provided, ICT shall provide at least one mode of operation that does not require user vision.

302.2 With Limited Vision. Where a visual mode of operation is provided, ICT shall provide at least one mode of operation that magnifies, one mode that reduces the field of vision required, and one mode that allows user control of contrast.

302.3 Without Perception of Color. Where a visual mode of operation is provided, ICT shall provide at least one mode of operation that does not require user perception of color.

302.4 Without Hearing. Where an auditory mode of operation is provided, ICT shall provide at least one mode of operation that does not require user hearing.

302.5 With Limited Hearing. Where an auditory mode of operation is provided, ICT shall provide at least one mode of operation that improves clarity, one mode that reduces background noise, and one mode that allows user control of volume.

302.6 Without Speech. Where a spoken mode of operation is provided, ICT shall provide at least one mode of operation that does not require user speech.

302.7 With Limited Manipulation. Where a manual mode of operation is provided, ICT shall provide at least one mode of operation that does not require fine motor control or operation of more than one control at the same time.

302.8 With Limited Reach and Strength. Where a manual mode of operation is provided, ICT shall provide at least one mode of operation that is operable with limited reach and limited strength.

CHAPTER 4: HARDWARE

401 General

401.1 Scope. The requirements of Chapter 4 shall apply to ICT that is hardware where required by 508 Chapter 2 (Scoping Requirements), 255 Chapter 2 (Scoping Requirements), and where otherwise referenced in any other chapter of the 508 Standards or 255 Guidelines.

EXCEPTION: Hardware that is assistive technology shall not be required to conform to the requirements of this chapter.

402 Closed Functionality

402.1 General. Except for personal headsets and other audio couplers, closed functionality of ICT shall be operable without requiring the user to attach or install assistive technology and shall conform to 402.

Advisory 402.1 General. Self-service machines, information kiosks, set-top boxes, and devices like most copiers, fax machines, and calculators have closed functionality because, by design, these products preclude the user from adding peripherals or software. ICT also may have closed functionality in practice even though the manufacturer did not design or develop it to be closed. Computers with security restrictions that prevent end users from adjusting settings or adding assistive technology have closed functionality.

402.2 Speech-Output Enabled. ICT with a display screen shall be speech-output enabled. Operating instructions and orientation, visible transaction prompts, user input verification, error messages, and all displayed information for full use shall be accessible to, and independently usable by, individuals with vision impairments. Speech output shall be delivered through a mechanism that is readily available to all users, including, but not limited to, an industry standard connector or a telephone handset. Speech shall be recorded or digitized human, or synthesized. Speech output shall be coordinated with information displayed on the screen.

EXCEPTIONS: 1. Audible tones shall be permitted instead of speech where the content of user input is not displayed as entered for security purposes, including, but not limited to, asterisks representing personal identification numbers.

2. Advertisements and other similar information shall not be required to be audible unless conveying information necessary for the transaction being conducted.

402.2.1 User Control. Speech output for any single function shall be automatically interrupted when a transaction is selected. Speech output shall be capable of being repeated and paused.

402.2.2 Braille Instructions. Where speech output is required by 402.2, braille instructions for initiating the speech mode of operation shall be provided. Braille shall conform to 36 CFR Part 1191, Appendix D, Section 703.3.

402.3 Volume. ICT that delivers sound, including speech required by 402.2, shall provide volume control and output amplification conforming to 402.3.

EXCEPTION: ICT conforming to 410.2 shall not be required to conform to 402.3.

402.3.1 Private Listening. Where ICT provides private listening, it shall provide a mode of operation for controlling the volume and a means for effective magnetic wireless coupling to hearing technologies.

Advisory 402.3.1 Private Listening. A handset that is hearing aid compatible and has a volume control would meet the requirements of this section.

402.3.2 Non-private Listening. Where ICT provides non-private listening, incremental volume control shall be provided with output amplification up to a level of at least 65 dB. Where the ambient noise level of the environment is above 45 dB, a volume gain of at least 20 dB above the ambient level shall be user selectable. A function shall be provided to automatically reset the volume to the default level after every use.

402.4 Characters. At least one mode of characters displayed on the screen shall be in a sans serif font. Where ICT does not provide a screen enlargement feature, characters shall be 3/16 inch (4.8 mm) high minimum based on the uppercase letter “I”. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

403 Biometrics

403.1 General. Biometrics shall not be the only means for user identification or control.

EXCEPTION: Where at least two biometric options that use different biological characteristics are provided, ICT shall be permitted to use biometrics as the only means for user identification or control.

Advisory 403.1 General - Exception. Biometrics use biological characteristics for user identification or control. Examples include: fingerprints, retinal or iris patterns, voice, facial features, and blood vessel patterns in the hand. Biometrics restricted to a single biological characteristic pose a significant barrier to individuals who do not possess that biological characteristic. Biometric methods based on dissimilar biological characteristics increase the likelihood that individuals possess at least one of the specified characteristics. Examples of biometrics that rely upon dissimilar biological characteristics are voice recognition and face recognition. Examples of biometrics that rely upon similar biological characteristics are scans that use either thumb or index finger prints. Allowing use of an identification card for authentication is an example of a non-biometric alternative.

404 Preservation of Information Provided for Accessibility

404.1 General. ICT that transmits or converts information or communication shall not remove non-proprietary information provided for accessibility or shall restore it upon delivery.

Advisory 404.1 General. This provision applies to conversion techniques, such as encoding, signal compression, and format transformation. Examples of ICT that might encode, compress, or transform information include firewalls, routers, and gateways. This provision does not require the addition or translation of information, simply its preservation. For example, this provision would not require an agency to change voice mail into text.

405 Flashing

405.1 General. Where ICT emits lights in flashes, there shall be no more than three flashes in any one-second period.

EXCEPTION: Flashes that do not exceed the general flash and red flash thresholds defined in WCAG 2.0 (incorporated by reference in Chapter 1) are not required to conform to 405.

406 Standard Connections

406.1 General. Where data connections used for input and output are provided, at least one of each type of connection shall conform to industry standard non-proprietary formats.

Advisory 406.1 General. The intent of this provision is to ensure compatibility with assistive technology by requiring the use of standard connections on ICT. Examples of data connections include expansion slots, ports, and connectors for cables. Industry standard non-proprietary formats include wireless connections to ICT, such as infrared (IR) and Bluetooth. Power cord connections are not data connections used for input and output.

407 Operable Parts

407.1 General. Where provided, operable parts of ICT shall conform to 407.

407.2 Contrast. Where provided, keys and controls shall contrast visually from background surfaces. Characters and symbols shall contrast visually from background surfaces with either light characters or symbols on a dark background or dark characters or symbols on a light background.

407.3 Tactilely Discernible. At least one tactilely discernible input control shall be provided for each function and shall conform to 407.3.

EXCEPTION: Devices for personal use with input controls that are audibly discernable without activation and operable by touch shall not be required to be tactilely discernible.

407.3.1 Identification. Input controls shall be tactilely discernible without activation and operable by touch. Where provided, key surfaces outside active areas of the display screen shall be raised above surrounding surfaces.

407.3.2 Alphabetic Keys. Where provided, individual alphabetic keys shall be arranged in a QWERTY keyboard layout and the “F” and “J” keys shall be tactilely distinct from the other keys. Where the ICT provides an alphabetic overlay on numeric keys, the relationships between letters and digits shall conform to ITU-T Recommendation E.161 (incorporated by reference in Chapter 1).

407.3.3 Numeric Keys. Where provided, numeric keys shall be arranged in a 12-key ascending or descending keypad layout. The number five key shall be tactilely distinct from the other keys.

Advisory 407.3.3 Numeric Keys. A telephone keypad and a keypad on a computer keyboard differ in one significant feature, ascending versus descending numerical order of the layout. Some keypads will have a double width zero key and decimal key instead of the asterisk and pound signs found on a telephone keypad. These examples conform to this provision.

407.4 Key Repeat. Where a keyboard with key repeat is provided, the delay before the key repeat feature is activated shall be fixed at, or adjustable to, 2 seconds minimum.

407.5 Timed Response. Where a timed response is required, the user shall be alerted visually, as well as by touch or sound, and shall be given the opportunity to indicate that more time is needed.

407.6 Status Indicators. Status indicators, including all locking or toggle controls or keys (e.g., Caps Lock and Num Lock keys), shall be discernible visually and by touch or sound.

407.7 Color. Color coding shall not be used as the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

407.8 Audio Signaling. Audio signaling shall not be used as the only means of conveying information, indicating an action, or prompting a response.

407.9 Operation. At least one mode of operation shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum.

407.10 Privacy. The same degree of privacy of input and output shall be provided to all individuals. When speech output required by 402.2 is enabled, the screen shall not blank automatically.

Advisory 407.10 Privacy. Under most circumstances, it is not necessary to blank the screen when the audio output is in use in order to ensure users with disabilities have a comparable degree of privacy. However, where screen blanking would be useful, the option to blank the screen must be under the control of the user.

407.11 Keys, Tickets, and Fare Cards. Where keys, tickets, or fare cards are provided, keys, tickets, and fare cards shall have an orientation that is tactilely discernible if orientation is important to further use of the key, ticket, or fare card.

Advisory 407.11 Keys, Tickets, and Fare Cards. Examples of keys include electronic machine-readable pass cards and identification badges. Examples of ways to make orientation tactilely discernible include braille labels, off-center holes, and a notched corner.

407.12 Reach Height. At least one of each type of operable part of stationary ICT shall be at a height conforming to 407.12.2 or 407.12.3 according to its position established in 407.12.1 for a side reach or a forward reach.

Advisory 407.12 Reach Height. This provision allows operable parts of ICT to be designed to be reached by a person seated in a wheelchair from a forward or side position, depending upon the design. For additional information on forward and side reaches, see 28 CFR Part 1191 Appendix D.

407.12.1 Vertical Reference Plane. Operable parts shall be positioned for a side reach or a forward reach determined with respect to a vertical reference plane. The vertical reference plane shall be located in conformance to 407.12.2 or 407.12.3.

407.12.1.1 Vertical Plane for Side Reach. Where a side reach is provided, the vertical reference plane shall be 48 inches (1220 mm) long minimum.

407.12.1.2 Vertical Plane for Forward Reach. Where a forward reach is provided, the vertical reference plane shall be 30 inches (760 mm) long minimum.

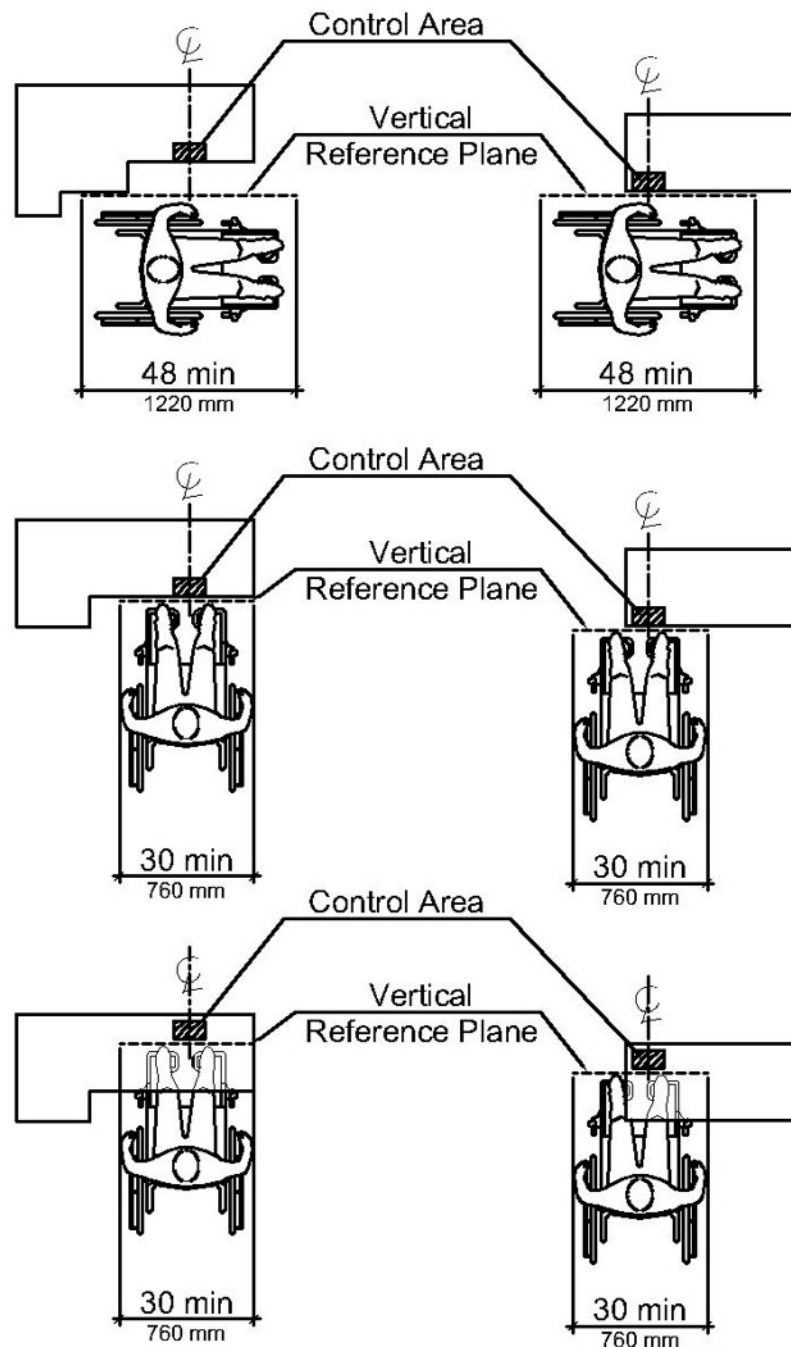


Figure 407.12.1

407.12.2 Side Reach. Operable parts of ICT providing a side reach shall conform to 407.12.2.1 or 407.12.2.2. The vertical reference plane shall be centered on the operable part and placed at the leading edge of the maximum protrusion of the ICT within the length of the vertical reference plane. Where a side reach requires

a reach over a portion of the ICT, the height of that portion of the ICT shall be 34 inches (865 mm) maximum.

407.12.2.1 Unobstructed Side Reach. Where the operable part is located 10 inches (255 mm) or less beyond the vertical reference plane, the operable part shall be 48 inches (1220 mm) high maximum and 15 inches (380 mm) high minimum above the floor.

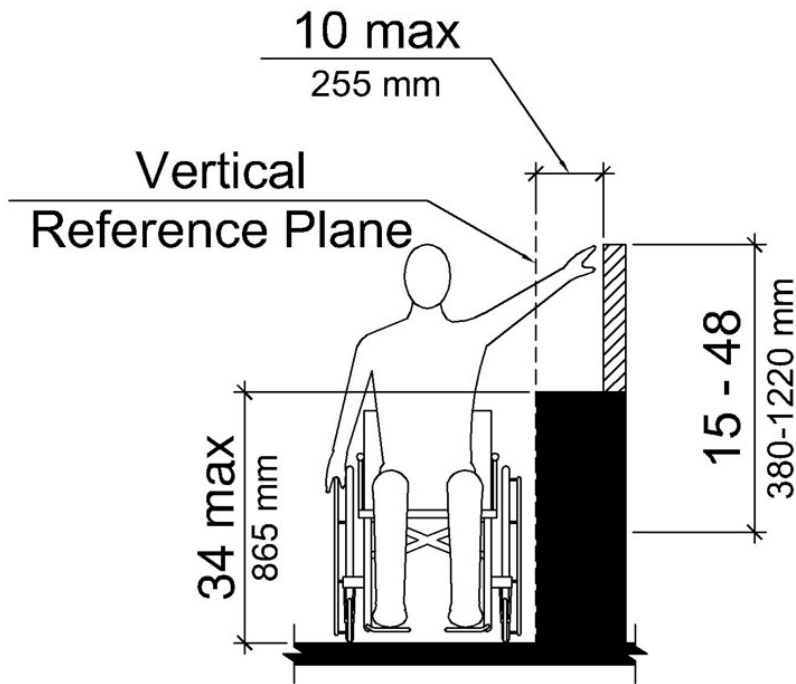


Figure 407.12.2.1

407.12.2.2 Obstructed Side Reach. Where the operable part is located more than 10 inches (255 mm), but not more than 24 inches (610 mm), beyond the vertical reference plane, the height of the operable part shall be 46 inches (1170 mm) high maximum and 15 inches (380 mm) high minimum above the floor. The operable part shall not be located more than 24 inches (610 mm) beyond the vertical reference plane.

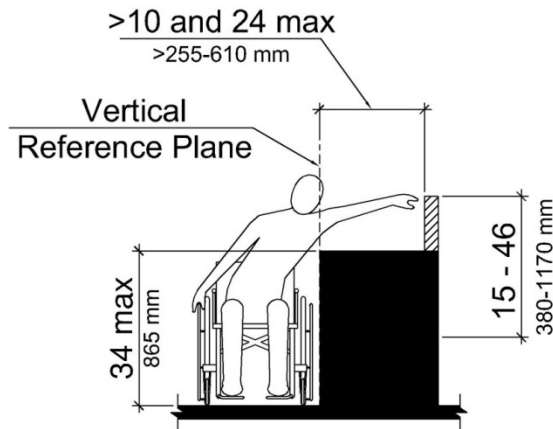


Figure 407.12.2.2

407.12.3 Forward Reach. Operable parts of ICT providing a forward reach shall conform to 407.12.3.1 or 407.12.3.2. The vertical reference plane shall be centered, and intersect with, the operable part. Where a forward reach allows a reach over a portion of the ICT, the height of that portion of the ICT shall be 34 inches (865 mm) maximum.

407.12.3.1 Unobstructed Forward Reach. Where the operable part is located at the leading edge of the maximum protrusion within the length of the vertical reference plane of the ICT, the operable part shall be 48 inches (1220 mm) high maximum and 15 inches (380 mm) high minimum above the floor.

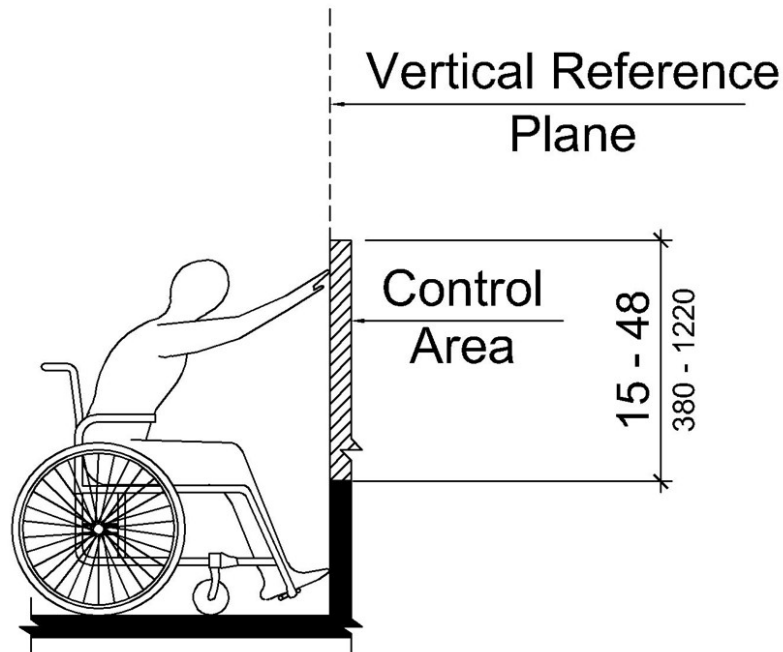


Figure 407.12.3.1

407.12.3.2 Obstructed Forward Reach. Where the operable part is located beyond the leading edge of the maximum protrusion within the length of the vertical reference plane, the operable part shall conform to 407.12.3.2. The maximum allowable forward reach to an operable part shall be 25 inches (635 mm).

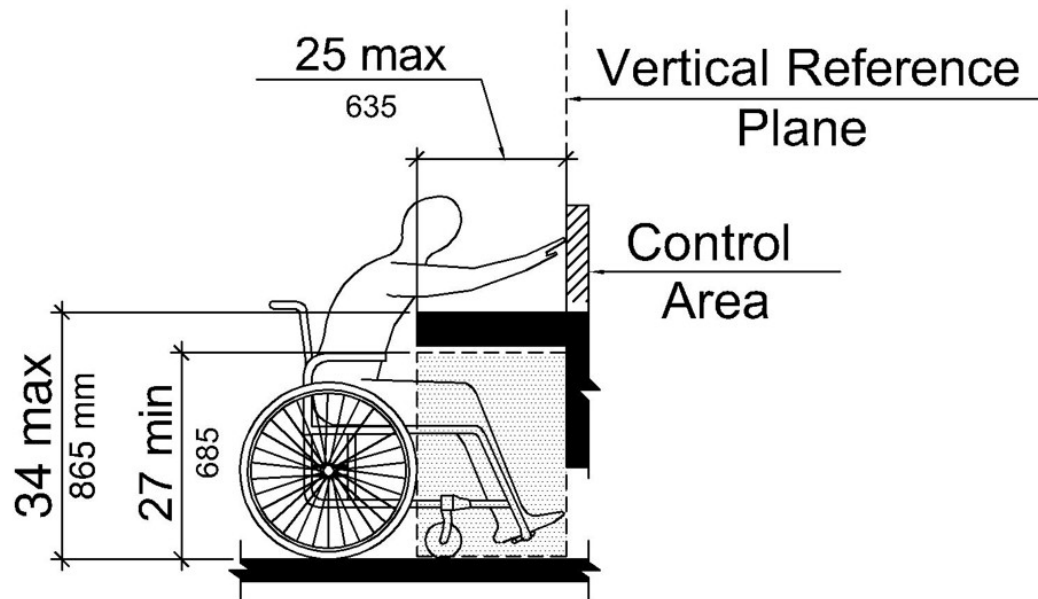


Figure 407.12.3.2

407.12.3.2.1 Height. The height of the operable part shall conform to Table 407.12.3.2.1.

Table 407.12.3.2.1 Operable Part Height

Reach Depth	Operable Part Height
Less than 20 inches (510 mm)	48 inches (1220 mm) maximum
20 inches (510 mm) to 25 inches (635 mm)	44 inches (1120 mm) maximum

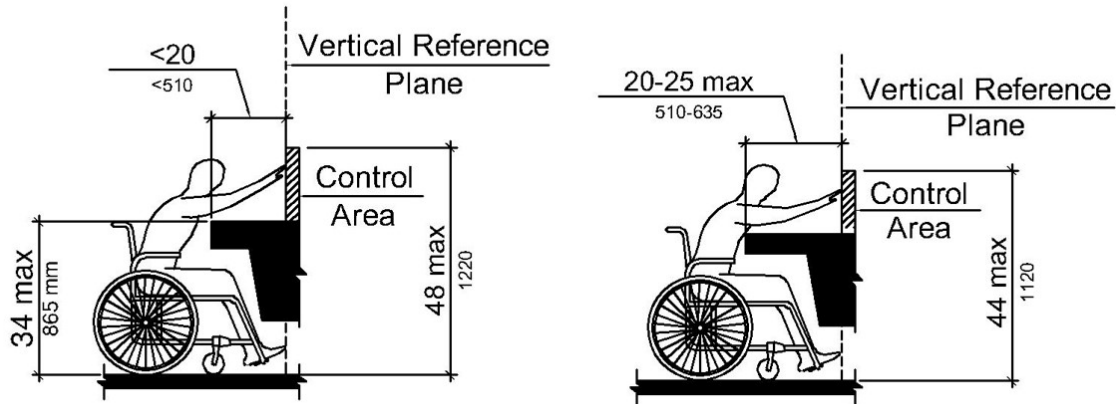


Figure 407.12.3.2.1

407.12.3.2.2 Knee and Toe Space. Knee and toe space under ICT shall be 27 inches (685 mm) high minimum, 25 inches (635 mm) deep maximum, and 30 inches (760 mm) wide minimum and shall be clear of obstructions.

EXCEPTIONS: 1. Toe space shall be permitted to provide a clear height of 9 inches (230 mm) minimum above the floor and a clear depth of 6 inches (150 mm) maximum from the vertical reference plane toward the leading edge of the ICT.

2. At a depth of 6 inches (150 mm) maximum from the vertical reference plane toward the leading edge of the ICT, space between 9 inches (230 mm) and 27 inches (685 mm) minimum above the floor shall be permitted to reduce at a rate of 1 inch (25 mm) in depth for every 6 inches (150 mm) in height.

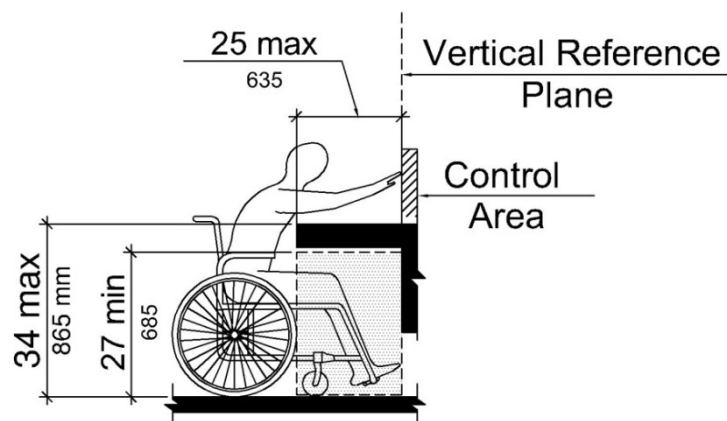


Figure 407.12.3.2.2

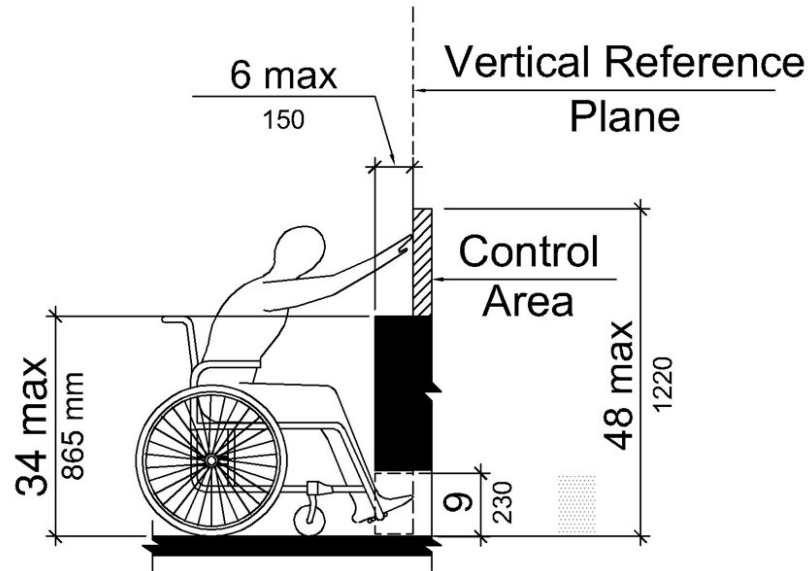


Figure 407.12.3.2.2 Exception 1

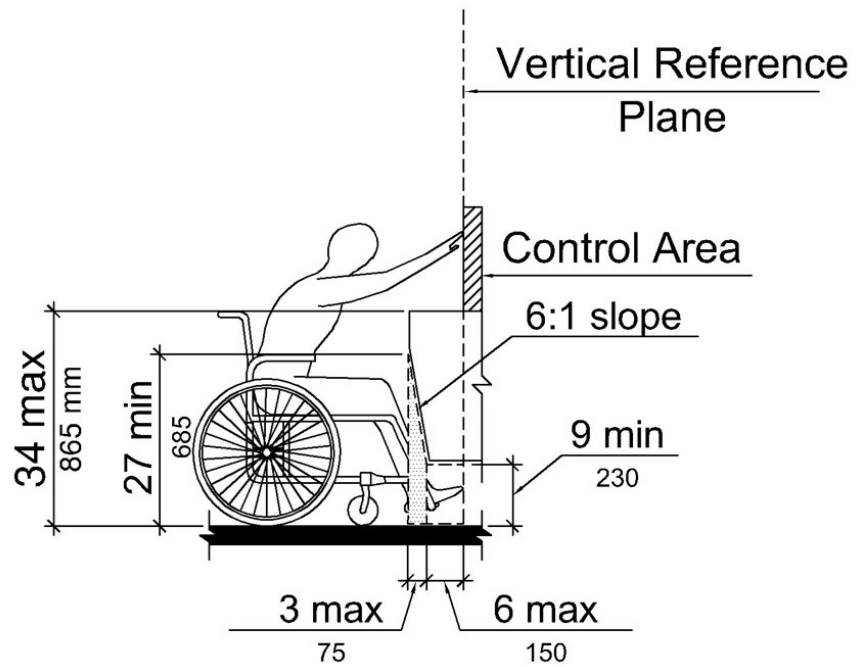


Figure 407.12.3.2.2 Exception 2

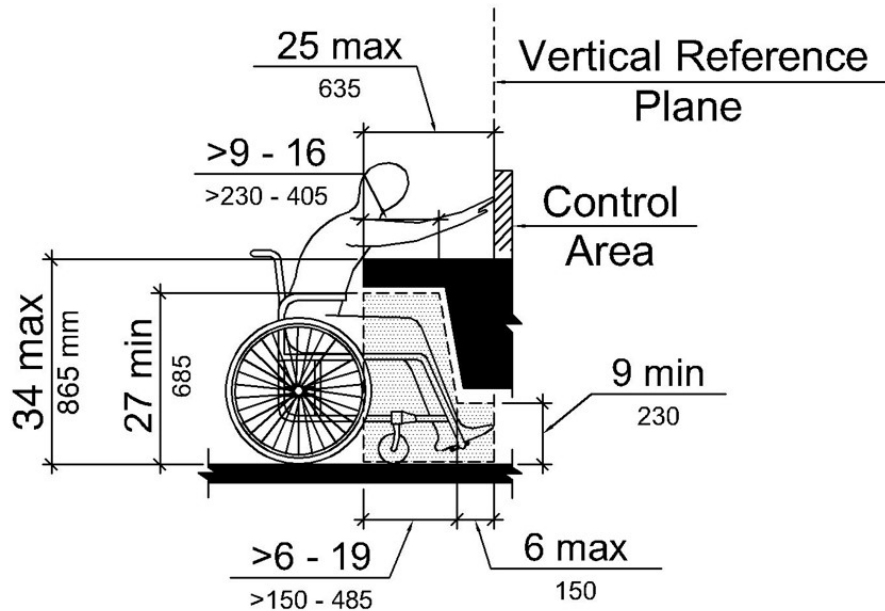


Figure 407.12.3.2.2 with both Exceptions applied

408 Display Screens

408.1 General. Where stationary ICT provides one or more display screens, at least one of each type of display screen shall be visible from a point located 40 inches (1015 mm) above the floor space where the display screen is viewed.

409 Transactional Outputs

409.1 General. Where transactional outputs are provided by ICT with speech output, the speech output shall audibly provide all information necessary to complete or verify a transaction.

EXCEPTIONS: 1. Machine location, date and time of transaction, customer account number, and the machine identifier shall not be required to be audible.

2. Duplicative information shall not be required to be repeated where such information has already been presented audibly.

3. Itineraries, maps, checks, and other visual images shall not be required to be audible.

Advisory 409.1 General. The information necessary to complete or verify a transaction depends on the nature of the transaction and the type of machine. Receipts, tickets, and similar transactional output usually are printed, but this is not always the case. For example, an event ticket might be transferred to a smart phone or PDA. Regardless of the delivery method, the ICT must convey audibly the information necessary to complete and verify a transaction.

410 ICT with Two-Way Voice Communication

410.1 General. ICT that provides two-way voice communication shall conform to 410.

410.2 Volume Gain. Volume gain shall be provided and shall conform to 47 CFR 68.317.

410.3 Magnetic Coupling. Where ICT delivers output by an audio transducer that is typically held up to the ear, ICT shall provide a means for effective magnetic wireless coupling to hearing technologies, such as hearing aids, cochlear implants, and assistive listening devices.

410.4 Minimize Interference. ICT shall reduce interference with hearing technologies to the lowest possible level and shall conform to 410.4.

410.4.1 Wireless Handsets. ICT in the form of wireless handsets shall conform to ANSI/IEEE C63.19-2011 (incorporated by reference in Chapter 1).

410.4.2 Digital Wireline. ICT in the form of digital wireline devices shall conform to TIA 1083 (incorporated by reference in Chapter 1).

410.5 Digital Encoding of Speech. ICT shall transmit and receive speech that is digitally encoded in the manner specified by ITU-T Recommendation G.722 (incorporated by reference in Chapter 1) for encoding and storing audio information.

EXCEPTION: Where ICT is a closed system, conformance to standards other than ITU-T Recommendation G.722 shall be permitted where equivalent or better acoustic performance is provided and where conversion to ITU-T Recommendation G.722 at the borders of the closed system is supported.

Advisory 410.5 Digital Encoding of Speech - Exception. One example of a closed system is a telephone network that enables calls to be placed between buildings and departments under the control of one entity, but is not used to receive or make outside calls.

410.6 Real-Time Text Functionality. Where ICT provides real-time voice communication, ICT shall support real-time text functionality and shall conform to 410.6.

410.6.1 Display of Real-Time Text. Where provided, multi-line displays shall be compatible with real-time text systems used on the network.

410.6.2 Text Generation. Where provided, features capable of text generation shall be compatible with real-time text systems used on the network.

410.6.3 Interoperability. Where ICT interoperates outside of a closed system of which it is a part, or where ICT connects to other systems, ICT shall conform to 410.6.3.1 or 410.6.3.2.

410.6.3.1 PSTN. Where ICT interoperates with the Public Switched Telephone Network (PSTN), real-time text shall conform to TIA 825-A (incorporated by reference in Chapter 1).

410.6.3.2 VoIP Using SIP. Where ICT interoperates with Voice over Internet Protocol (VoIP) products or systems using Session Initiation Protocol (SIP), real-time text shall conform to RFC 4103 (incorporated by reference in Chapter 1).

410.6.4 Voice Mail, Auto-Attendant, and IVR Compatibility. Where provided, voice mail, auto-attendant, and interactive voice response telecommunications systems shall be compatible with real-time text that conforms to 410.6.3.

410.6.5 HCO and VCO Support. Real-time voice communication shall permit users to intermix speech with the use of real-time text and shall support modes that are compatible with Hearing Carry Over (HCO) and Voice Carry Over (VCO).

Advisory 410.6.5 HCO and VCO Support. This provision supports the use of simultaneous text and speech in two-way communication, including telecommunications relay service. HCO allows a person with a speech disability to type their side of a conversation which is read by the other party and to listen directly to their voice. VCO allows a person who is deaf or hard of hearing to read conversation that is typed by the other party and to speak directly to them. HCO and VCO may be facilitated by a telecommunications relay service communication assistant.

410.7 Caller ID. Where provided, caller identification and similar telecommunications functions shall be visible and audible.

Advisory 410.7 Caller ID. Examples of functions addressed by this requirement include messages waiting, duration of call in progress, dialing directory, wireless signal strength, and battery power.

410.8 Video Communication. Where ICT provides real-time video functionality, the quality of the video shall be sufficient to support communication using sign language.

411 Closed Caption Processing Technologies

411.1 General. Where ICT displays or processes video with synchronized audio, ICT shall conform to 411.1.1 or 411.1.2.

411.1.1 Decoding of Closed Captions. Players and displays shall decode closed caption data and support display of captions.

411.1.2 Pass-Through of Closed Caption Data. Cabling and ancillary equipment shall pass through caption data.

412 Audio Description Processing Technology

412.1 General. Where ICT displays or processes video with synchronized audio, ICT shall provide a mode of operation that plays associated audio description.

412.1.1 Digital Television Tuners. Where audio description is played through digital television tuners, the tuners shall conform to ATSC A/53 Digital Television Standard, Part 5 (2010) (incorporated by reference in Chapter 1). Digital television tuners shall provide processing of audio description when encoded as a Visually Impaired (VI) associated audio service that is provided as a complete program mix containing audio description according to the ATSC A/53 standard.

413 User Controls for Captions and Audio Description

413.1 General. Where ICT displays video with synchronized audio, ICT shall provide user controls for closed captions and audio description conforming to 413.1.

EXCEPTION: Devices for personal use where closed captions and audio description can be enabled through system-wide platform settings shall not be required to conform to 413.1.

413.1.1 Caption Controls. ICT shall provide user controls for the selection of captions in at least one location that is comparable in prominence to the location of the user controls for volume.

413.1.2 Audio Description Controls. ICT shall provide user controls for the selection of audio description in at least one location that is comparable in prominence to the location of the user controls for program selection.

CHAPTER 5: SOFTWARE

501 General

501.1 Scope. The requirements of Chapter 5 shall apply to ICT software and applications where required by 508 Chapter 2 (Scoping Requirements), 255 Chapter 2 (Scoping Requirements), and where otherwise referenced in any other chapter of the 508 Standards or 255 Guidelines.

EXCEPTIONS: 1. Web applications that conform to all Level A and Level AA Success Criteria and all Conformance Requirements in WCAG 2.0 (incorporated by reference in Chapter 1) shall not be required to conform to 502 and 503.

2. Software that is assistive technology and that supports the accessibility services of the platform shall not be required to conform to the requirements in this chapter.

Advisory 501.1 Scope. Software includes platforms, applications, and firmware. Firmware is read-only memory (ROM) based software that is sometimes distinguished from software and hardware. Examples of platforms are: desktop operating systems; embedded operating systems, including mobile; web browsers; plug-ins to web browsers that render a particular media or format; and sets of components that allow other applications to execute, such as applications which support macros or scripting. Applications may be web-based or client-side software. Examples of applications are: email clients; word processors; help desk systems; content management systems; e-learning courseware; and terminal emulation.

502 Interoperability with Assistive Technology

502.1 General. Platforms, software tools provided by the platform developer, and applications, shall conform to 502.

EXCEPTION: Platforms and applications that have closed functionality and that conform to 402 shall not be required to conform to 502.

502.2 Documented Accessibility Features. Platforms and applications shall conform to 502.2.

502.2.1 User Control of Accessibility Features. Platforms shall provide user control over platform features that are defined in the platform documentation as accessibility features.

502.2.2 No Disruption of Accessibility Features. Applications shall not disrupt platform features that are defined in the platform documentation as accessibility features.

502.3 Accessibility Services. Platforms and software tools provided by the platform developer shall provide a documented set of accessibility services that support

applications running on the platform to interoperate with assistive technology and shall conform to 502.3. Applications that are also platforms shall expose the underlying platform accessibility services or implement other documented accessibility services.

502.3.1 Object Information. The object role, state(s), boundary, name, and description shall be programmatically determinable. States that can be set by the user shall be capable of being set programmatically, including through assistive technology.

502.3.2 Row, Column, and Headers. If an object is in a table, the occupied rows and columns, and any headers associated with those rows or columns, shall be programmatically determinable.

502.3.3 Values. Any current value(s), and any set or range of allowable values associated with an object, shall be programmatically determinable. Values that can be set by the user shall be capable of being set programmatically, including through assistive technology.

502.3.4 Label Relationships. Any relationship that a component has as a label for another component, or of being labeled by another component, shall be programmatically determinable.

502.3.5 Hierarchical Relationships. Any hierarchical (parent-child) relationship that a component has as a container for, or being contained by, another component shall be programmatically determinable.

502.3.6 Text. The content of text objects, text attributes, and the boundary of text rendered to the screen, shall be programmatically determinable. Text that can be set by the user shall be capable of being set programmatically, including through assistive technology.

502.3.7 Actions. A list of all actions that can be executed on an object shall be programmatically determinable. Applications shall allow assistive technology to programmatically execute available actions on objects.

502.3.8 Focus Cursor. Applications shall expose information and mechanisms necessary to track and modify focus, text insertion point, and selection attributes of user interface components.

502.3.9 Event Notification. Notification of events relevant to user interactions, including but not limited to, changes in the component's state(s), value, name, description, or boundary, shall be available to assistive technology.

502.4 Platform Accessibility Features. Platforms and platform software shall conform to the requirements in ANSI/HFES 200.2, Human Factors Engineering of Software User Interfaces — Part 2: Accessibility (incorporated by reference in Chapter 1) listed below:

1. Section 9.3.3 Enable sequential entry of multiple (chorded) keystrokes.
2. Section 9.3.4 Provide adjustment of delay before key acceptance.
3. Section 9.3.5 Provide adjustment of same-key double-strike acceptance.
4. Section 10.6.7 Allow users to choose visual alternative for audio output.
5. Section 10.6.8 Synchronize audio equivalents for visual events.
6. Section 10.6.9 Provide speech output services.
7. Section 10.7.1 Display any captions provided.

503 Applications

503.1 General. Applications shall conform to 503.

503.2 User Preferences. Applications shall permit user preferences from platform settings for color, contrast, font type, font size, and focus cursor.

Advisory 503.2 User Preferences. This provision applies to applications that are platforms. One example of an application that is also a platform is a web browser.

EXCEPTION: Applications that are designed to be isolated from their underlying platforms, including Web applications, shall not be required to conform to 503.2.

Advisory 503.2 User Preferences - Exception. One example of an application that is designed to be isolated from its underlying platform is a media player that is restricted from having access to the desktop operating system.

503.3 Alternative User Interfaces. Where an application provides an alternative user interface that functions as assistive technology, the application shall use platform and other industry standard accessibility services.

503.4 User Controls for Captions and Audio Description. Where ICT displays video with synchronized audio, ICT shall provide user controls for closed captions and audio description conforming to 503.4.

503.4.1 Caption Controls. Where user controls are provided for volume adjustment, ICT shall provide user controls for the selection of captions at the same menu level as the user controls for volume or program selection.

503.4.2 Audio Description Controls. Where user controls are provided for program selection, ICT shall provide user controls for the selection of audio description at the same menu level as the user controls for volume or program selection.

504 Authoring Tools

504.1 General. Where an application is an authoring tool, the application shall conform to 504 to the extent that information required for accessibility is supported by the destination format.

Advisory 504.1 General. One example of an authoring tool is a web application that allows users to create new web pages. Another example is an application for editing video. Authoring tools can also be used to create and publish content for use with telecommunications products or services. One example of a telecommunications authoring tool is an interactive voice response system (IVR) that includes software for the creation of content used to populate menu choices. These requirements for authoring tools enable this content to be accessible.

504.2 Content Creation or Editing. Authoring tools shall provide a mode of operation to create or edit content that conforms to all Level A and Level AA Success Criteria and all Conformance Requirements in WCAG 2.0 (incorporated by reference in Chapter 1) for all features and formats supported by the authoring tool. Authoring tools shall permit authors the option of overriding information required for accessibility.

Advisory 504.2 Content Creation or Editing. Content is the information and sensory experience to be communicated to the user through software, including code or markup that defines the content's structure, presentation, and interactions.

EXCEPTION: Authoring tools shall not be required to conform to 504.2 when used to directly edit plain text source code.

Advisory 504.2 Content Creation or Editing - Exception. Examples of authoring tools that are only plain text editors include Emacs and Windows Notepad. This exception also applies to more sophisticated tools when they are used in plain text mode.

504.2.1 Preservation of Information Provided for Accessibility in Format Conversion. Authoring tools shall, when converting content from one format to another or saving content in multiple formats, preserve the information required for accessibility to the extent that the information is supported by the destination format.

Advisory 504.2.1 Preservation of Information Provided for Accessibility in Format Conversion. One example of how accessibility information is preserved occurs when HTML is exported from a word processor. In this case, alternative text associated with embedded images follows the native word processing format to the HTML source code. By controlling the accessibility information in the destination format, the author can ensure consistent use of that information in both formats.

504.3 Prompts. Authoring tools shall provide a mode of operation that prompts authors to create content that conforms to all Level A and Level AA Success

Criteria and all Conformance Requirements in WCAG 2.0 (incorporated by reference in Chapter 1). Authoring tools shall provide the option for prompts during initial content creation or when the content is saved.

Advisory 504.3 Prompts. Prompts do not need to be provided for every component in the content. Intrusive or overused prompts can decrease usability. Examples of prompts that are activated when the content is near completion are automated checks and wizards.

504.4 Templates. Where templates are provided, templates allowing content creation that conforms to all Level A and Level AA Success Criteria and all Conformance Requirements in WCAG 2.0 (incorporated by reference in Chapter 1) shall be provided for a range of template uses.

CHAPTER 6: SUPPORT DOCUMENTATION AND SERVICES

601 General

601.1 Scope. The technical requirements in Chapter 6 shall apply to ICT support documentation and services where required by 508 Chapter 2 (Scoping Requirements), 255 Chapter 2 (Scoping Requirements), and where otherwise referenced in any other chapter of the 508 Standards or 255 Guidelines.

602 Support Documentation

602.1 General. Documentation that supports the use of ICT shall conform to 602.

Advisory 602.1 General. Examples of documentation that supports ICT are installation guides, user guides, and manuals that describe the features of a product and how it is used. Documentation may take the form of stand-alone documents or be integrated into products as on-line or context-sensitive help.

602.2 Accessibility and Compatibility Features. Documentation shall list and explain how to use the accessibility and compatibility features required by Chapters 4 and 5. Documentation shall include accessibility features that are built-in and accessibility features that provide compatibility with assistive technology.

Advisory 602.2 Accessibility and Compatibility Features. One example of an accessibility feature is the ability to access commands and navigate using the keyboard. Voice recognition software, screen readers, and alternative keyboards rely upon keyboard control for accessible and efficient operation. Keyboard navigation includes support for the following: cursor keys (up, down, left and right arrows), tab and shift-tab (to cycle through fields), enter or spacebar (to select or activate), hot keys, macros, and other keyboard acceleration mechanisms.

Where ICT components are designed to be part of an integrated system, this provision requires that the documentation explains how to configure the system to support accessibility. For example, the documentation for a DVD player and multimedia projector is required to explain how to configure the DVD player and projector to support the display of closed captions.

602.3 Electronic Support Documentation. Documentation in electronic format, including Web-based self-service support, shall conform to all Level A and Level AA Success Criteria and all Conformance Requirements in WCAG 2.0 (incorporated by reference in Chapter 1), or ISO 14289-1 (PDF/UA-1) (incorporated by reference in Chapter 1).

602.4 Alternate Formats for Non-electronic Support Documentation. Alternate formats usable by individuals who are blind or have low vision shall be provided upon request for support documentation in non-electronic formats.

Advisory 602.4 Alternate Formats for Non-electronic Support

Documentation. Examples of alternate formats are electronic versions of hard copy, braille, large print and audio files. None of the alternate formats listed are accessible to all users who are blind or have low vision.

603 Support Services

603.1 General. ICT support services including, but not limited to, help desks, call centers, training services, and automated self-service technical support, shall conform to 603.

603.2 Information on Accessibility and Compatibility Features. ICT support services shall include information on the accessibility and compatibility features required by 602.2.

Advisory 603.2 Information on Accessibility and Compatibility Features. A best practice is for ICT support services to provide training programs about the following topics: accessibility requirements for individuals with disabilities; methods of communication used by individuals with disabilities; assistive technology commonly used with ICT products; designing for accessibility; solutions for accessibility and compatibility of ICT with assistive technology; accessible document creation and remediation; ICT product assessment; user testing; the use of people-first language; and sensitivity training.

603.3 Accommodation of Communication Needs. Support services shall be provided directly to the user or through a referral to a point of contact. Such ICT support services shall accommodate the communication needs of individuals with disabilities.

Advisory 603.3 Accommodation of Communication Needs. The Federal Communications Commission maintains a list of contact information for telecommunications service providers and manufacturers of telecommunications products that can be useful when support services are provided through a referral. Examples of accommodations are qualified sign language interpreters, assistive listening systems, TTYs, real time captioning, and telecommunications relay services. Telecommunication relay services can be TTY, speech-to-speech, and video relay service. A best practice is for help desk and other ICT support services to use a variety of communication technologies. Examples of such communication technologies include Internet posting (such as message boards and website blogs), telephones, email, fax, postal mail, texting, and instant messaging.