# ISO/IEC JTC 1 Special Working Group on Accessibility (SWG-A)

# JTC 1 SWG-A N 584

**2014-09-15**

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| **Document Type:** | Contribution |
| **Title:** | **Canadian Response to SWG-A N 580: Call for Additional User Needs for the User Needs Summary** |
| **Source:** | Jim Carter, Canada |
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| **Requested Action:** | For consideration by Ad Hoc 18 on User Needs Summary Refresh. |

Jennifer, Please find attached the Canadian submission on additional user needs. Regards, Jim Carter

# Canadian Contribution on

# additional user needs

# to be included in the

# SWG-A User Needs Summary


**[2014-09-06]**

# Canadian contribution on additional user needs to be included in the SWG-A User Needs Summary

Canada prefers the alternate structuring of the user needs provided in SWG-A N0580. This structuring is much easier to understand and apply than the existing organization in ISO/IEC TR 29138-1.

Canada agrees with the new user needs identified in SWG-A N0580.

Canada is using the new structure as the basis for its suggestions of additional user accessibility needs.
- We have used this structure to identify the appropriate level of detail for new needs to be compatible with existing needs
- We have included our suggestions for new needs via track changes in or near the location where we believe they belong
- Where possible we have justified our suggestions with references to existing accessibility guidance and where this is not possible we have included our reasons in square brackets after the suggested additional need.

Given the number of potential new user needs identified in SWG-A N0580 and in this document, Canada believes that there might also be other important user needs to be identified. We recognize that in the early days of SWG-A many user needs were identified in the face to face discussions we had at live meetings that were well attended. We recommend that there is a need for a live meeting to further identify additional user needs and to fully discuss options for presenting these user needs.

Canada also recommends that the wording of user needs be revised (where necessary) to make use of a consistent grammatical form (i.e. while many user needs are worded starting with an infinitive (to do something), others have various different grammatical forms). In many cases this could be accomplished by prefixing a need with "to have" or some similar words.

## 1    Perceivable-related user needs

### 1.1.1    Guide 71 high level needs with existing 29138-1 and some additional user needs related to perceivable

The following uses the high level user needs from Guide 71 to provide an alternate organization of user needs to aid in identifying potentially missing needs:

1. Perceivable-related user needs
   NOTE: this relates to WCAG **Principle 1 Perceivable** and on Guide 71 goal of **Perceivability**

   1.1    to use a specific sensory modality (or a set of specific modalities) to perceive information [G71 6.2.5.4.a]
         NOTE: this generalizes **WCAG 1.1** Provide text alternatives and **WCAG 1.2** Provide alternatives for time-based media
               1.1.1 information presented in an alternative to text [14-12]
                     - information presented in an alternative to text based representation [13-14]
                     - feedback using pictures or symbols [14-10]
                     - any text read aloud to them [13-7]
               1.1.2 to experience information via multiple **simultaneous modalities**
                     - to see and **hear** text simultaneously [1-12]
               1.1.3 to have **visual** information available in other modalities
                     - visual information also available in auditory form [1-1]
                     - visual information also available in tactile form  [1-2]
                     - a non-visual equivalent to any visual indicators or operational cues, designed (power light) or intrinsic (e.g. visual movements) [4-1]

- feedback to be audio or tactile (i.e. non-visual) [5-1]
- text, illustrations and diagrams in spoken form [14-2]

1.1.4 to have **auditory** information available in other modalities
- auditory information also available in visual form [2-1]
- auditory information also available in tactile form [2-2]
- a non-audio indicator for any auditory indicators or operational cues, designed (e.g. beeps, lights) or intrinsic (e.g. machine sounds, visual movements) [4-2]
- a visual or auditory alternative to any subtle tactile feedback [5-3]

1.1.5 to have **tactile** information available in other modalities
- tactile information also available in visual form [new – need parallel to above]
- tactile information also available in auditory form [new – need parallel to above]
- a non-tactile alternative to any subtle tactile feedback [4-3]

1.1.6 **tactile** indicators (i.e. for those who need indicator to be both non-visual and non-auditory) [4-8]
- feedback to be tactile (i.e. both non-visual and non-auditory) [5-2]

1.1.7 visual indication of keyboard shortcuts [6-23]

1.2    to control various presentation attributes of a modality [G71 6.2.5.4.b]

1.2.1 visual or tactile feedback to occur at the same location as the control [5-10]

1.2.x  to be able to control presentation attributes of individual items within a modality (e.g. access features) [new- there might be different needs for making access features more distinct than other components of a system]

1.2.2 acceptable presentation attributes specific to the **visual** modality
- sufficient brightness for visually presented information (luminance for displays -- illumination for printed)  [1-3]
- any information (other than the colour itself) that is presented through colour to be also presented in another way that does not rely on colour [1-4]
- to change the colours of information [1-5]
- to adjust the colours to make things easier to read [5-7]
- text readable with reduced visual acuity  [1-6]
  Note: Automatically scroll large print text horizontally or vertically on a screen without the need to manually manipulate the source material.
- image resolution and speed be sufficient to understand any sign language presented [14-5]
- to change the magnification of objects or parts of a display [new 9241-20 7.2.9]
- to avoid seizure-inducing flashing [ISO 9241-171 10.1.1, WCAG 2.3]]
- to have visual information be usable without stereo vision [new – some users might have sight in only one eye]

1.2.3 acceptable presentation attributes specific to the **auditory** modality
- to adjust the volume to a suitable level [2-3]
- auditory events, alerts etc., be multi-frequency [2-4]
- auditory events, alerts etc., be multi-octave (i.e. involve high, mid, and low frequencies)
- multi-channel auditory information available in monaural form [2-6]
- to adjust the audio characteristics (e.g. pitch, balance) [2-9]
- to silence audio output [14-11]
- to adjust different audio channels [new 9241-20 7.3.10]
- any information (other than the stereo sound itself) that is presented through stereo sound to be also presented in another way that does not rely on stereo sound [new – need parallel to above re color]

1.2.4 acceptable presentation attributes specific to the **tactile** modality [new] [ISO 9241-920 3.2.3]
- to adjust vibration amplitude [ISO 9241-920 4.2.8]
- to control the speed of presentation of dynamic text [ISO 9241-920 5.1]

1.2.5 when vibration is used as a substitute for different auditory events, then some need vibration to have different vibration patterns (rather than vibration frequency or strength) [2-5]

1.3    to be able to distinguish among the individual elements of information that are being presented [G71 6.2.5.4.c]

NOTE: this generalizes **WCAG 1.3** Create content that can be presented in different ways (for example simpler layout) without losing information or structure.

- 1.3.1 to locate and identify all keys and controls via non-visual means without activating them [3-1]

  Note: touch sensitive or very light touch controls located where they will not be touched while tactilely finding keys they must use to operate device.

- 1.3.2 to have non-actionable elements (logos, decorative details) not look or feel like buttons or controls [3-2]

- 1.3.3 sufficient landmarks and cues to be able to quickly re-find all keys and controls during use [3-3]

  NOTE: Nibs, groupings, spacing are examples of tactile landmarks.

- 1.3.4 alternatives that are different, when different signals are used (e.g. different ring tones, or tactile or visual indicators) [4-4] [5-4]

- 1.3.5 ~~alternatives that are different, when different signals are used (e.g. different ring tones, or tactile or visual indicators)~~ ~~[5-4]~~to be able to distinguish between individual elements without them interfering with one another
  - to avoid phantom sensations [new – e.g. tinnitus]
  - to avoid sensory adaptation [ISO 9241-920 3.3.3]

- 1.3.6 to be able to distinguish among the individual **visual** elements being presented
  - controls that visually contrast with their surroundings [3-4]

    Note: some benefit from ability to adjust colors of on screen controls
  - elements that can be used with low vision [new]
  - controls to be in places where they can be easily found with low vision and with no sight [3-5]
    - focus and pointing indicators that are visible with low vision [3-7]
    - visual feedback that is obvious with low vision [5-5]
    - visual indicators (e.g. LEDs, on screen indicators, mouse cursors) that are visible with low vision [4-5]
  - elements that can be used without relying on color
    - controls and indicators that are perceivable without relying on colour [4-6]
    - feedback that is perceivable without relying on color [5-6]
  - enlargeable text wordwrap that stays on screen and is understandable [14-9]

- 1.3.7 to be able to distinguish among the individual **auditory** elements being presented
  - sufficient quality (e.g. volume, direction, clarity, frequency) for audio cues [4-7]
  - sufficient quality (e.g. volume, direction, clarity, frequency) for audio feedback [5-8]
  - audio feedback that does not require tone differentiation [5-9]

- 1.3.8 to have content presented in a simpler format without losing information [WCAG 1.3]

- 1.4 to control the physical environment (to the extent reasonable) so that it does not interfere with perceiving the information [G71 6.2.5.4.d]

  NOTE: this generalizes **WCAG 1.4** Make it easier for users to see and hear content including separating foreground from background

  [NOTE: see also approachability for further guidance on the removal of more general barriers]

  - 1.4.1 to perceive foreground visual information in the presence of background [1-11]
  - 1.4.2 to perceive foreground audio information in the presence of background (including ambient noise) [2-8]
  - 1.4.3 the ability to avoid visual or auditory distractions that prevent focusing on a task [7-4]
    - to avoid glare [new]
    - to avoid reflective glare [1-8]
  - 1.4.4 to avoid glare from excessive brightness (of material or surrounding) [1-9]
  - 1.4.5 visual information generated by access features (such as captions) not to occur simultaneously with other visual information that they must view [14-4]

    EXAMPLE: Captions that are not essential to understanding are not displayed at same time as critical information is presented on the screen.
  - 1.4.6 to not have device noise or regular audio output interfere with ability to understand accessibility audio [14-3]
    - to not have acoustic output of a tactile display interfere with ability to understand audio[ISO 9241-920 3.3.1]
  - 1.4.8 to be able to reduce or expand the content in the system [UAAG 2, 3]

1.4.9  to limit heat from devices to avoid injury to the user or effects on the user's ability to perceive tactile information [ISO 9241-920 3.3.2]

# 2 Operable-related user needs

### 2.1.1 Guide 71 high level needs with existing 29138-1 and some additional user needs related to operable

The following uses the high level user needs from Guide 71 to provide an alternate organization of user needs to aid in identifying potentially missing needs:

2. Operable-related user needs
  NOTE: this relates to WCAG **Principle 2 Operable** and on Guide 71 goals of **Controllability, Usability and Error Tolerance**

2.1 to be able to use a specific interaction modality (or a set of specific interaction modalities) to interact with the system  [G71 6.2.7.4.a]
  NOTE: this generalizes WCAG 2.1 Make all functionality available from a keyboard
  2.1.1 to be able to use the **tactile** modality alone as a source of inputs to the system [new – parallel to perceivability]
    - to operate all functionality using only tactilely discernable controls coupled with non-visual feedback [6-1]
      Note: In order to operate products efficiently and in available time (see 6-7 and 6-12) some need to be able to access all computer software functionality from the keyboard (or keyboard emulator) without any visual feedback
  2.1.2 to access all functionality without having to use touch or very light touch activated controls [6-2]
    - to fully operate the product without requiring a pointing device [6-3]
  2.1.3 an alternative method to operate any tactile interactions [new – parallel to 6-5]
  2.1.4 to be able to use the **auditory** modality alone as a source of inputs to the system [new –parallel to perceivability]
    - a method to control the system using speech [9241-20 7.4.1]
  2.1.5 an alternative method to operate any speech controlled functions [6-5]
  2.1.6 to be able to use the **tactile** modality alone as a source of inputs to the system [new –parallel to perceivability]
  2.1.7 an alternative method to the use of gestures [new – parallel to 6-5]
  2.1.8 to be able to switch among the available input/output alternatives without requiring them to reconfigure or restart the system [new – 9241-171 8.4.1]
  2.1.9 to have simultaneous use of alternate interaction modalities [new – 9241-20 7.1.3 – parallel to perceivability]
  2.1.10 to access all computer software functionality from the keyboard with only visual feedback [6-4]
  2.1.11 alternative modalities to text input [6-21]

2.2 to control various interaction attributes of a modality [new –parallel to perceivability]
  2.2.1 acceptable presentation attributes specific to the tactile modality [new –parallel to perceivability]
    - to access all functionality without having to use touch or **very light touch activated controls** [6-2]
    - a method to fully operate the product that does not require much force [6-7]
    - a method to fully operate the product that does not require much continuous force [6-8]
    - a method to fully operate the product that does not require tight grasping [6-11]
    - a method to fully operate the product that does not require pinching [6-12]
    - a method to fully operate the product that does not require twisting of the wrist [6-13]
  2.2.2 acceptable presentation attributes specific to the **auditory** modality [new –parallel to perceivability]
    - a method to control the speed of voice input [new 9241-20 7.4.5]
  2.2.3 acceptable presentation attributes specific to the visual modality [new –parallel to perceivability]
    - a method to adjust the time involved when using eye tracking to be used to indicate the selection action [new – parallel to 9241-20 7.4.5]

2.3 to be able to perform the task using various parts of the body and specific types of actions [G71 6.2.7.4.b]

    2.3.1 a method to fully operate the product that does not require much reach (weakness,, stature or wheelchair) [6-10]

    2.3.2 to operate the product without use of hands [6-18]

    2.3.3 to operate the product with only a left or only a right hand [6-17]

    2.3.4 a method to fully operate the product that does not require direct body contact [6-14]

    2.3.5 alternatives to biometric means of identification [6-20]

    2.3.6 to operate the product using only speech [6-19]

2.4 to be able to perform tasks one step at a time [G71 6.2.7.4.c]

    2.4.1 a method to fully operate the product that does not require simultaneous actions [6-6]

    2.4.2 to be able to separately identify, select, and activate functions/controls [new – 11581-10 9.1]

2.5 to be able to interact with the system at one's own pace [G71 6.2.7.4.d]

NOTE: this generalizes WCAG 2.2 Provide users enough time to read and use content

    2.5.1 much more time to complete actions - and no feeling of time pressure [7-2]

    2.5.2 to control the presentation and re-playing of dynamically presented information [new]

- to replay, pause, change speed in order to understand information [14-7]
- to pause, and re-play information presented using audio, video or animation [1-10]
- to slow audio, video, or animated information down slightly [14-6]
- to pause, and re-play audio information [2-7]
- to replay auditory information [14-8]

    2.5.3 to adjust the speed and acceleration of input devices [6-16]

NOTE: Some need a setting for adjusting the acceleration of a pointer.

    2.5.4 to increase the rate of audio alternatives (unless there are minimal audio alternatives) [12-3]

2.6 to be supported in their diverse contexts to accomplish their tasks with effectiveness, efficiency and satisfaction.

NOTE: this is based on the Guide 71 goal of **Usability**

    2.6.1 to be able to avoid making mistakes in completing tasks [G71 6.2.8.4.a]

    2.6.2 to perform tasks with a minimum of physical and cognitive exertion [G71 6.2.8.4.b]

- to have similar patterns of activation for similar actions [6-22]
- to be able to operate the product without being fatigued [new 9241-20 7.1.9]

    2.6.3 to be able to complete tasks in an efficient manner relative to one's own abilities (i.e. what is efficient for one user will not necessarily be equally efficient for other users) [G71 6.2.8.4.c]

NOTE this corresponds to the current UNS category of 5.12 Be able to efficiently operate product

    2.6.4 to be able to complete tasks within the available time [G71 6.2.8.4.d]

    2.6.5 to be able to complete tasks with the available resources [G71 6.2.8.4.e]

- a method to fully operate the product that does not require much stamina [6-9]
- a method to fully operate the product that does not require much accuracy of movement [6-15]

    2.6.6 to be satisfied with the outcome of interacting with the system [G71 6.2.8.4.f]

    2.6.7 to have confidence that using the system will not involve any negative consequences or unacceptable risks [G71 6.2.8.4.g]

    2.6.8 to be satisfied that the system is worth using [G71 6.2.8.4.h]

    2.6.9 to have a positive physical and psychological experience using the system [G71 6.2.8.4.i]

2.x to be able to perform supporting tasks related to the use of the system

    2.x.1 to be able to perform basic maintenance tasks on their system [ISO 9241-20 9.1.1]

    2.x.2 to replace consumable items used by the system [ISO/IEC 29136 5.5.3]

    2.x.3 to be able to install, set-up, anc connect the system on their own [ISO 9241-20 9.5.2, ISO/IEC 29136 5.7]

    2.x.4 to be able to switch off, disconnect, and store the system on their own [ISO 9241-20 9.5.3, 9.5.4, 9.5.5]

    2.x.5 to be able to reset the system to a known state [ISO/IEC 29136 5.5.2]

2.7 to be able to complete the intended task or activity with either no, or minimal, corrective action or negative consequences despite predictable errors

NOTE: this generalizes **WCAG 3.3** Help users avoid and correct mistakes and is based on the Guide 71 goal of **Error Tolerance**

2.7.1 to be able to explore a system without unintentionally activating components or their functionality [G71 6.2.9.4.a]
- products and controls designed so they can be explored without activation, either tactilely or through keyboard navigation [8-1]
- systems that can be positioned so that they are stable during use [ISO/IEC 29136 5.4.1]

2.7.2 to be able to successfully operate a system with limited body control (e.g. strength, tremors) [G71 6.2.9.4.b]
- to operate controls with tremor or spasmodic movements without inadvertent entries [8-2]
- controls that are not activated by a slight touch or when they receive keyboard focus [8-3]
- to avoid damaging the system when additional force is used to perform some action [new 29136 5.4.1]

2.7.3 to be able to detect when errors have been made [G71 6.2.9.4.c]
- notification when the product detects errors made by the user [9-1]

2.7.4 to be able to recover from errors made from interacting with the system (whenever possible) [G71 6.2.9.4.d]
- unambiguous guidance on what to do in the event of a reported error [9-2]

2.7.5 to reset a system to an earlier or original condition as a means to responding to errors [G71 6.2.9.4.e]
- a means (e.g. a mechanism) to go back and undo the last thing(s) they did [9-3]
- to reset (to initial condition) [9-4]

2.7.6 to avoid errors by having negative consequences be obvious, easy to avoid, and difficult to trigger [G71 6.2.9.4.f]

# 3   Understandable-related user needs

### 3.1.1   Guide 71 high level needs with existing 29138-1 and some additional user needs related to understandable

The following uses the high level user needs from Guide 71 to provide an alternate organization of user needs to aid in identifying potentially missing needs:

3. Understandable-related user needs
  NOTE: this relates to WCAG **Principle 3 Understandable, WCAG 2.4** Provide ways to help users navigate, find content, and determine where they are and on Guide 71 goal of **Understandability**

  3.1   to be able to obtain an overview of the system and its components and functionalities [G71 6.2.6.4.a]
    3.1.1   to get overview and orient themselves to product and functions/parts without relying on visual presentation or markings on product [13-1]

  3.2   to be able to understand information presented by the system [G71 6.2.6.4.b]
    NOTE this is based on **WCAG 3.1** Make text content readable and understandable
    3.2.1   wording, symbols, and indicators used on products that are as easy to understand as possible given the device and task [13-2]
      Note: Information and feedback is to be "salient," and "specific" rather than subtle or abstract in order to understand it.
    3.2.2   textual material to be worded as clearly and simply as possible [14-1]
    3.2.3   textual information presented using figures of speech (such as abbreviations, idioms, metaphors, etc.) is also presented in a way that does not require understanding of those figures of speech [14-13]
    3.2.4   information to be available regarding the meaning associated with colours and symbols [14-14]
    3.2.5   providing visual information pictorially as well a via text [new 9241-20 7.6.5]
    3.2.6   supporting cultural and linguistic differences [new 9241-20 7.6.10]
    3.2.7   text alternatives to be provided for all non-textual information [new]
    3.2.8   providing picture alternatives to symbols (e.g., a photograph of a chair as an alternative to a stick figure of a chair) [new – some symbols might be too abstract for some users to understand]
    3.2.9   to be able to customize abstract icons and symbols with real-world representations they can personally understand [new – it might be difficult for some users to use (both due to recognition and memory issues) the default set of symbols provided by a system]

  3.3   to have information that supports their cognitive abilities [G71 6.2.6.4.c]
    3.3.1   clear and easy activation mechanisms for any access features [13-4]
    3.3.2   navigation that supports different thinking styles [13-5]
    3.3.3   capability of navigating using audible queues [new 9241-20 7.2.3]
    3.3.4   to understand product if they have difficulty thinking hierarchically [13-6]
    3.3.5   structure when navigating long audio material [12-11]
    3.3.6   to avoid unnecessary high cognitive demands [ISO 9241-20 7.6.2]

  3.4   to have the steps for completing tasks minimized and clearly explained [G71 6.2.6.4.d]
    3.4.1   steps for operations that are minimized and clearly described [13-8]
    3.4.2   interfaces that limit the memorization required of the user to operate them successfully [13-9]
    3.4.3   simple interfaces that only require them to deal with the controls they need (advanced or 3.4.4   optional controls removed in some fashion) [13-11]

  3.5   to have cues to assist them in completing tasks [G71 6.2.6.4.e]
    3.5.1   cues to assist them in multi-step operations [13-10]
    3.5.2   providing cues to assist the user in focusing on important information [new 9241-7.6.6]

3.6    to have feedback that shows users the results of their actions [G71 6.2.6.4.f]

        3.6.1  clear feedback of connector engagement (e.g. power cord, PC card, USB connector, etc.) [5-11]

3.7    to be able to control the pace of interaction with the system [G71 6.2.6.4.g]
[see also operable]

        3.7.1  much more time to read displayed information [7-1]
        3.7.2  information necessary to plan their actions in advance [7-3]

3.8    to be able to access help when needed [G71 6.2.6.4.h]

# 4 Robust-related user needs

### 4.1.1 Guide 71 high level needs with existing 29138-1 and some additional user needs related to robust

The following uses the high level user needs from Guide 71 to provide an alternate organization of user needs to aid in identifying potentially missing needs:

4. Robust-related user needs
>  NOTE: this relates to WCAG **Principle 4 Robust** and on Guide 71 goals of **Compatibility with other systems, Equitable use, Approachability, Support for individualization, Conformity with user expectations,** and **Suitability for the widest range of users**

> 4.1 to be able to use other systems as a means to interact with it to accomplish the task [goal 11]
> > NOTE: this is based on **WCAG 4.1** Maximize compatibility with current and future user agents, including assistive technologies and on the Guide 71 goal **Compatibility with other systems**
> > 4.1.1 to be able to use their own assistive products or assistive technology to interact with all the functionalities of the system [G71 6.2.9.11.a]
> > > • to use their AT with the device  [15-2]
> > > (e.g. Alternate display, amplifiers, or alternate controls)
> > > • full and efficient functional control of a product using their AT, including pass-through of user feedback and notifications such as error messages [15-3]
> > > • an AT available that will work with new technologies, at the time of release of the new technology [15-4]
> > > • to have standard types of hardware and software connections / interfaces on systems for their AT to interact with [new 13066-1 4.2.1]
> > > • to be able to discover information about all user-interface elements using their AT [new – 9241-171 8.5.6]
> > > • to monitor output operations using their AT [new – 9241-171 8.5.12]
> > > • to have their systems and devices provide standard hardware/software connections [ISO/IEC 13066-1 various clauses]
> > 4.1.2 to have the system not interfere with their assistive products or assistive technology [G71 6.2.9.11.b]
> > > • that the product not interfere with AT  [15-1]
> > > (e.g. No electrical noise interference with hearing devices.)
> > > • To be able to use multiple systems that do not interfere with one another [ISO 9241-20 9.1.5]
> > > • To be able to use multiple AT that do not interfere with one another [ISO/IEC 13066-1 8.3]
> > 4.1.3 to access the controls that allow them to turn on and adjust the built in accessibility features [16-2]
> > 4.1.4 to have their accessibility functions available at all times, without disruption [16-10]

> 4.2 to be able to accomplish tasks in an identical manner whenever possible or in an equivalent manner when an identical manner is not possible [goal 10]
> > NOTE this is based on the Guide 71 goal **Equitable use**
> > 4.2.1 to be able to use a system (that follows this standard) in a manner that is as similar as possible to other users [G71 6.2.9.10.a]
> > > • private listening capability, when using audio alternatives to visual information in public places [10-1]
> > > • protection of the privacy of their information, even if they are not able to do the "expected" things to protect it themselves [10-2]
> > > • security of their information, even if they are not able to do the "expected" things to protect it themselves [10-3]
> > 4.2.2 to be able to use a system (that follows this standard) in a manner that is different from but equivalent to that of other users [G71 6.2.9.10.b]
> > 4.2.3 to have available alternate ways of interacting with a system (that follows this standard) [G71 6.2.9.10.c]

- alternate modes of operation that are effective given the time constraints of the task [12-1]
- hardcopy documents to be usable with one hand or mouthstick [12-10]
- to have all alternate ways of interacting available, regardless of whether they were provided to meet specific accessibility needs or not

4.3　to be able to overcome any physical or psychological barriers and physically or remotely access it to accomplish the task [goal 4]

NOTE this is based on the Guide 71 goal **Approachability**

4.3.1　to have adequate room to fit themselves and their assistive products or assistive technology [G71 6.2.3.4.a]
- an accessible path and a means to position oneself within reach of installed products [16-3]

4.3.2　to have system controls located within close reach [G71 6.2.3.4.b]
- information within viewable range of those of short stature or seated in wheelchairs [1-7]
- information within viewable range of those of short stature or seated in wheelchairs [4-9]
- controls within viewable range of people of short stature or seated in wheelchairs [3-6]
- to be able to adjust the location and position of devices and controls [ISO 9241-20 7.5.2, ISO/IEC 29136 7.1.2]

4.3.3　to have interaction options clearly presented [G71 6.2.3.4.c]

4.3.4　to have appropriate levels of safety
- products where hazards are obvious, easy to avoid, and difficult to trigger [11-1]
- products that do not rely on specific senses or fine movement to avoid injury [11-2]

  EXAMPLE: Products that don't assume that body parts will never stray into openings or that only gentle body movements will occur around the products.
- to be able to use a system over long periods of time without this use causing fatigue or discomfort [9241-20 7.1.9]

4.3.5　to use system safely without needing or experiencing hazards warnings
- to use products safely without seeing hazards or warnings [11-3]
- to use products safely without hearing hazard warnings [11-4]

4.3.6　to avoid patterns that cause them to have seizures

  NOTE: this is based on **WCAG 2.3** Do not design content in a way that is known to cause seizures
- to avoid visual patterns that causes them to have seizures [11-5]
- to avoid auditory patterns that causes them to have seizures [11-6]
- products that do not give off electromagnetic radiation [11-7]

  NOTE: Users might have embedded devices (e.g. pacemakers, bionic interfaces to replacement limbs) and/or attached devices (e.g. drug-pumps, or alarm cords) which could be sensitive to electromagnetism and are actually part of the "user".
- products that do not give off chemicals that they are allergic to [11-8]

  NOTE: Further verification is needed to substantiate this user need for standard development purposes.

4.3.7　to have appropriate levels of privacy and security [G71 6.2.3.4.d]

4.3.8　to be able to use the system remotely as well as directly [G71 6.2.3.4.e]
- to use software to control hardware operations, wherever possible [new - 9241-171 – 8.4.5]

4.4　to be able to individualize components, functions or operations to meet their needs [goal 3]

NOTE this is based on the Guide 71 goal **Support for individualization**

4.4.1　to be provided with (and to be able to choose) the way of interacting with a system that best works for them (including activating and deactivating built-in accessibility features) [G71 6.2.3.4.a]
- to have applications not override or defeat built-in accessibility features [12-5]
- accessibility functions that can be returned to an initial state individually or together after each user [12-9]
- to activate or deactivate individualization features [new 9241-129 7.2.2]
- to perform, undo, and redo individualization actions [new 9241-129 7.2.4]

4.4.2 to be provided with information on available options for interacting with a system on which to base a choice of interaction methods [G71 6.2.3.4.b]
- information on the availability of individualization capabilities [new 9241-129 7.3.1]
- information on individualization actions taken by the system [new 9241-129 7.3.6]

4.4.3 to be provided an accessible means to choose individualization features, to be maintained for future uses of the system, until changed by the user [G71 6.2.3.4.c]
- system level accessibility preference settings that apply across applications [12-4]
- accessibility preference settings preserved unless explicitly changed [12-6]
  Note: Any applications that want to change accessibility features can ask the user first, and return the setting when the application ends.
- preference settings to change immediately preferably without requiring system reboot [12-7]
- to save and restore individual preference settings [12-8]

4.5 to be able to predict how a system and its interactions behave based on past experience, the context of use, laws and standards, and/or commonly accepted conventions [goal 2]
NOTE this is based on **WCAG 3.2** Make Web pages appear and operate in predictable ways and on the Guide 71 goal **Conformity with user expectations**

4.5.1 not to be surprised by the results of interactions with the system [G71 6.2.2.4.a]
- consistent and predictable user interfaces [12-12]
- feedback to be predictable [5-12]
- keyboard navigation that follows a meaningful sequence through form controls [12-2]
- location and layout of controls to be consistent [3-9]
- each function on its own key rather than having keys change their functions but look/feel the same [13-12]

4.5.2 to be able to apply personal knowledge and experience to interact successfully with the system [G71 6.2.2.4.b]
- products or services to use standard conventions, words and symbols for their culture (cross-cultural if possible) [13-3]
- to have content appear and behave in predictable ways [WCAG 3.2]

4.5.3 to receive instruction or training directed at preparing them for new knowledge needed to interact successfully with the system [G71 6.2.2.4.c]
- accessible training and support materials [16-5]

4.5.4 to obtain immediate and easily accessible help or further instructions, where such help can be provided by the system [G71 6.2.2.4.d]
- timely access to trained customer service personnel (e.g. Help Desk) [16-4]
- information describing the layout of the operational parts [3-8]

4.6 to have the needs of diverse users met in diverse contexts [goal 1]
NOTE this is based on the Guide 71 goal **Suitability for the widest range of users**

4.6.1 to be included as system users through the provision of accessible modes and methods of use [G71 6.2.1.4.a]
- to know that a product is usable by them and how to set it up to work for them [13-13]
- to be able to access information on any limitations on a system that might preclude access to them [new – more explicit information than 13-13]
- to have new technologies that are accessible when they are released [16-1]
- to have new releases of a system not change or diminish the accessibility provided by previous releases [CA]

4.6.2 to have accessible support for using the system
- electronic access to copyrighted and otherwise protected material [16-6]
- a means to provide feedback about improvements to accessibility to meet their particular needs [16-8]
- product accessibility information to be disseminated to distributors, retailers, installers, system integrators, customer organizations, and people with disabilities [16-9]
- to know that a product is usable by them and how to set it up to work for them [13-13]

4.6.3 to have the system accessible to users with combinations of impairments and in adverse environmental conditions [G71 6.2.1.4.b]

- the product to be usable by those with multiple disabilities [16-7]