**Published Standards from ISO Technical Committee 159 (Ergonomics), Subcommittee 4 (Ergonomics of Human-System Interaction)**

**ISO 1503:2008 Spatial orientations and direction of movement – Ergonomic requirements**

ISO 1503:2008 sets out design principles, procedures, requirements and recommendations for the spatial orientation and direction of movement of controls and displays used in tools, machines, industrial robots, office machines, earth-moving machinery, transportation (automobiles, railway electric cars/rolling stock, aircraft, ships, etc.), information, daily commodities, public utilities and the operational components of building facilities.

Comment: ISO 1503 is expected to apply in the design of any kind of human-system interaction requiring the use of displays and controls.

**ISO 9241-1:1997 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 1: General introduction**

ISO 9241-1 provides a general description of the 17 parts of ISO 9241.

Comment: ISO 9241-1 is being revised to reflect the new structure and content of the 9241 series which is no longer restricted to "office work with visual display terminals."

**ISO 9241-2:1992 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 1: Guidance on task requirements**

Guidance in ISO 9241-2 is relevant to both the organization implementing the system and the people using the equipment and should be applied in accordance with local, regional or national agreements and regulations. The objective is to enhance the efficiency and well-being of the individual user by applying ergonomics knowledge in the light of practical experience, to the design of tasks.

Comment: ISO 9241-2 only provides general information on task requirements.

**ISO 9241-4:1998 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 4: Keyboard requirements**

ISO 9241-4 provides guidance on the design of keyboards for typical office tasks. The specifications cover the general design of the keyboard and the design of keys. General design includes items such as: palm rests; the visible surfaces of the keytops; the slope of the keyboard and keyboard slope adjustment. The design of keys covers items such as: key layout; key displacement and force; keying feedback (such as kinaesthetic feedback); rebound action; key roll-over; key repeat function; key legends; cursor keys; numeric keypad; and keytop shape. The standard specifies the technical measurements that need to be taken to assess compliance, and includes a user performance test for manufacturers of novel keyboards (whose keyboard would otherwise not meet the standard) in an appendix.

Comment: This standard will eventually be replaced by standards in the ISO 9241-400 series.

**ISO 9241-5:1998 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 4: Workstation layout and postural requirements**

ISO 9241-5 specifies ergonomic guiding principles that apply to the design of workstation equipment used for display screen work. The standard emphasizes that the design of the workplace needs to be preceded by an analysis of the tasks that it is intended to support. This information will help identify the different tasks that are carried out and the relative contributions of the different components that support the tasks, which in turn will help users adopt a comfortable and healthy working posture. The specifications are derived from

five guiding principles: versatility-flexibility; fit; postural change; user information; and maintainability-adaptability. The specifications themselves cover: posture; ease of adjustment; support surfaces; seating; additional support elements (such as document holders and footrests); and the layout of the workstation in the workspace. An informative annex provides anthropometric data needed for workstation design and selection.

**ISO 9241-6:1999 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 6: Guidance on work environment**

ISO 9241-6 provides guidance on basic properties of the working environment to support display screen work. The characteristics of the work environment are considered under six headings: natural and artificial lighting (including glare control); sound and noise (including the reduction of noise effects); mechanical vibrations (for example, from air conditioning systems or nearby industrial activities); electromagnetic fields and static electricity (and its effects on the image quality of visual displays); thermal environment (including thermal comfort and humidity); and space organisation and workplace layout. The standard includes four annexes that cover: lighting; methods for measuring and evaluating sound; measurement, evaluation and assessment of whole-body vibrations; and thermal environment (this includes recommended values for thermal comfort).

**ISO 9241-9:2000 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 9: Requirements for non-keyboard input devices**

ISO 9241-9 applies to several types of non-keyboard input devices including mice, pucks, joysticks, trackballs, tablets and overlays, touch-sensitive screens, styli and light pens. The standard specifies the quality of the input device in terms of a performance criterion: “it is considered useable [*sic*] if users can achieve a satisfactory level of performance on a given task and maintain an acceptable level of effort and satisfaction”. The standard also includes a set of design requirements that first covers general requirements and recommendations (such as resolution, button design and upper extremity and head posture), and then addresses specific input device requirements and recommendations (such as mice, pucks and joysticks).

Comment: This standard will be replaced by standards in the ISO 9241-400 series.

**ISO 9241-11:1998 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 11: Guidance on usability**

ISO 9241-11 introduces the concept of usability but does not make specific recommendations in terms of product attributes. Instead it defines usability in terms of effectiveness, efficiency and satisfaction. The standard describes how it can be applied to: specify and measure the usability of products; specify and evaluate usability during design; and specify and measure a work system in use. The standard includes five annexes: an example of how to specify the context of use; examples of usability measures; an example of a usability requirements specification; relationship to other international standards; and a bibliography.

Comment: ISO 9241-11 is currently under discussion concerning revision or the development of supplemental material to further explain the concept of usability and its use in design, development and evaluation.

**ISO 9241-12:1998 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 12: Presentation of information**

ISO 9241-12 contains recommendations on how to present **visual** information on screens so that users can easily perform “perceptual tasks” (such as searching for information on the screen). The recommendations are based on seven guiding principles: clarity (information should be conveyed quickly and accurately); discriminabilty (information should be able to be distinguished accurately); conciseness (provide only the information necessary to complete the task); consistency (present the same information in the same way throughout the application); detectability (direct the user’s attention to the information required); legibility (information should be easy to read); and comprehensibility (the meaning should be clearly understandable). The recommendations are provided in three main areas: organization of information; graphical objects; and coding techniques.

Comments: ISO 9241-12 only provides guidance on the presentation of visual information and does not include recommendations related to icons, non-visual methods of presentation or the use of color. ISO 9241-12 is under consideration for revision.

**ISO 9241-13:1998 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 13: User Guidance**

ISO 9241-13 contains recommendations on user guidance. The recommendations cover general advice; prompts; feedback; status information; error management; and on-line help.

Comment: This standard does not cover documentation (either on-line or paper) or on-line tutorials.

**ISO 9241-14:1997 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 14: Menu dialogues**

ISO 9241-14 provides recommendations for the design of systems that use menus (such as pop-up, pull-down and text-based menus). The standard specifies the application areas where menus are most useful (for example, when use of the system is infrequent and the user does not know what options are available). The recommendations cover: menu structure (such as logical categories, grouping options and ordering items); menu navigation (including titles and access time); option selection and execution (including selection methods, use of the keyboard and voice activation); menu presentation (including placement and use of icons).

**ISO 9241-15:1997 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 15: Command dialogues**

ISO 9241-15 provides recommendations for systems that use command line interfaces (e.g., DOS and UNIX). With a command line interface, the user works with the system by typing in commands that meet certain syntactic rules. The standard begins by describing the appropriate application areas for these interfaces (for example, applications that people use frequently, and that require speed and flexibility). The recommendations cover: structure and syntax (for example, macros and command arguments); command representation (for example, command names and abbreviations); input and output considerations (for example, command reuse and editing); and feedback and help (for example, command processing and error feedback).

**ISO 9241-16:1999 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 16: Direct manipulation dialogues**

ISO 9241-16 provides recommendations for systems that use direct manipulation. With direct manipulation, the user acts directly on the objects on the screen (for example by dragging a document icon and dropping it on an application to open it). The standard describes the appropriate application areas for these interfaces (for example, the system can simulate real-world task objects, their properties and operations). The recommendations cover: general information (metaphors; the appearance of objects used in direct manipulation; feedback; and input devices); manipulation of objects (general considerations; pointing and selecting; dragging; sizing of objects; and rotating); direct manipulation of text objects (pointing and selecting; and sizing of text); direct manipulation of windows (general considerations; pointing and selecting; and sizing of windows); and direct manipulation of control icons (pointing and selecting).

**ISO 9241-17:1998 Ergonomic requirements for office work with visual display terminals (VDTs) -- Part 17: Form filling dialogues**

ISO 9241-17 provides recommendations for systems that use form filling interfaces (now commonly seen on the web). With form filling interfaces, users see a display of related fields and enter data where required. The standard begins by describing the appropriate application areas for these interfaces (for example, when users have experience with paper forms but limited experience with computers). The recommendations cover form filling structure, input considerations, feedback and navigation. Form filling structure covers: general; layout; and fields and labels. Input considerations covers: general; alphanumeric text entry; choice entries; control; and field validation. Feedback covers: echoing; cursor and pointer position; field errors;

transmission acknowledgement; and database changes. Navigation covers: initial cursor position; movement between fields; return to initial field; tabbing; scrolling; and form selection.

Comment: This standard will soon be replaced by ISO 9241-143 (Ergonomics of human-system interaction – Part 143: Forms) which was based on the ANSI HFES 200.3 section on forms and includes additional content not included in 9241-17.

**ISO 9241-20:2008 Ergonomics of human-system interaction -- Part 20: Accessibility guidelines for information/communication technology (ICT) equipment and services**

ISO 9241-20:2008 is intended for use by those responsible for planning, designing, developing, acquiring, and evaluating information/communication technology (ICT) equipment and services. It provides guidelines for improving the accessibility of ICT equipment and services such that they will have wider accessibility for use at work, in the home, and in mobile and public environments. It covers issues associated with the design of equipment and services for people with a wide range of sensory, physical and cognitive abilities, including those who are temporarily disabled, and the elderly.

Comment: ISO 9241-20 is intended to be an “umbrella” accessibility standard for human-system interaction standards.

**ISO 9241-100:2010 Ergonomics of human-system interaction -- Part 100: Introduction to standards related to software ergonomics**

ISO 9241-100:2010 enables users of standards related to software ergonomics to identify ergonomics standards particularly relevant to software development, gain an overview on the content of software-ergonomics standards, understand the role of software-ergonomics standards in specifying user requirements as well as designing and evaluating user interfaces and understand the relationship between the various standards.

**ISO 9241-110:2006 Ergonomics of human-system interaction -- Part 110: Dialogue principles**

ISO 9241-110:2006 sets forth ergonomic design principles formulated in general terms (i.e. presented without reference to situations of use, application, environment or technology) and provides a framework for applying those principles to the analysis, design and evaluation of interactive systems.

Although ISO 9241-110:2006 is applicable to all types of interactive systems, it does not cover the specifics of every context of use (e.g., safety critical systems, collaborative work).

Comment: ISO 9241-110 covers such dialogue principles as

**ISO 9241-129:2010 Ergonomics of human-system interaction -- Part 129: Guidance on software individualization**

ISO 9241-129:2010 provides ergonomics guidance on individualization within interactive systems, including recommendations on where individualization might be appropriate or inappropriate and how to apply individualization.

It focuses on individualization of the software user interface to support the needs of users as individuals or as members of a defined group. It does not recommend specific implementations of individualization mechanisms. It provides guidance on how the various aspects of individualization are made usable and accessible, but does not specify which individualizations are to be included within a system. (Individualizations depend on the specific context of use for which an interactive system is to be designed and/or used, and need to be developed for that specific context of use.)

**ISO 9241-151:2008 Ergonomics of human-system interaction -- Part 151: Guidance on World Wide Web user interfaces**

ISO 9241-151:2008 provides guidance on the human-centred design of software Web user interfaces with the aim of increasing usability. Web user interfaces address either all Internet users or closed user groups such as the members of an organization, customers and/or suppliers of a company or other specific communities of users.

The recommendations given in this part of ISO 9241:2008 focus on the following aspects of the design of Web user interfaces: high-level design decisions and design strategy; content design; navigation and search; content presentation.

Comment: ISO 9241-151 does not address user interfaces of different types of user agents such as Web browsers or additional tools such as Web authoring tools; neither does it provide detailed guidance on technical implementation nor on issues of aesthetic or artistic design.

**ISO 9241-171:2008 Ergonomics of human-system interaction -- Part 171: Guidance on software accessibility**

ISO 9241-171:2008 provides ergonomics guidance and specifications for the design of accessible software for use at work, in the home, in education and in public places. It covers issues associated with designing accessible software for people with the widest range of physical, sensory and cognitive abilities, including those who are temporarily disabled, and the elderly. ISO 9241-171:2008 is applicable to the accessibility of interactive systems. It addresses a wide range of software (e.g. office, Web, learning support and library systems).

It promotes the increased usability of systems for a wider range of users. Although it does not cover the behaviour of, or requirements for, assistive technologies (including assistive software), it does address the use of assistive technologies as an integrated component of interactive systems.

Comment: ISO 9241-171 is entirely compatible with the Accessibility part of ANSI/HFES 200.

**ISO 9241-210:2010 Ergonomics of human-system interaction -- Part 210: Human-centred design for interactive systems**

ISO 9241-210:2010 provides requirements and recommendations for human-centred design principles and activities throughout the life cycle of computer-based interactive systems. It is intended to be used by those managing design processes, and is concerned with ways in which both hardware and software components of interactive systems can enhance human–system interaction.

Comment: ISO 9241-210 is an update and revision to ISO 13407:1999 with has been widely used.

**ISO 9241-300:2008 Ergonomics of human-system interaction -- Part 300: Introduction to electronic visual display requirements**

ISO 9241-300:2008 provides an introduction to the other parts in the ISO 9241 “300” subseries, and explains its modular structure. The ISO 9241 “300” subseries establishes requirements for the ergonomic design of electronic visual displays. These requirements are stated as performance specifications, aimed at ensuring effective and comfortable viewing conditions for users with normal or adjusted-to-normal eyesight. Test methods and metrology, yielding conformance measurements and criteria, are provided for design evaluation.

**ISO 9241-302:2008 Ergonomics of human-system interaction -- Part 302: Terminology for electronic visual displays**

ISO 9241-302:2008 provides a comprehensive terminology for electronic visual displays and explains the terms and definitions used in the other parts of ISO 9241.

**ISO 9241-303:2008 Ergonomics of human-system interaction -- Part 303: Requirements for electronic visual displays**

ISO 9241-303:2008 establishes image-quality requirements, as well as providing guidelines, for electronic visual displays. These are given in the form of generic — independent of technology, task and environment — performance specifications and recommendations that will ensure effective and comfortable viewing conditions for users with normal or adjusted-to-normal eyesight.

ISO 9241-303:2008 does not address issues of accessibility for people with disabilities. However, it does take into account aspects of the eyesight of older people and could be of value to people dealing with issues of visual impairment in certain cases: the specification of essential characteristics for normal viewing can be used to gauge the severity of different visual abnormalities so that appropriate solutions can be identified.

**ISO 9241-304:2008 Ergonomics of human-system interaction -- Part 304: User performance test methods for electronic visual displays**

ISO 9241-304:2008 provides guidance for assessing the visual ergonomics of display technologies with user performance test methods (as opposed to the optical test methods given in ISO 9241-305). Its use will help to ensure that, for a given context of use, a display meets minimum visual ergonomics requirements. It covers only visual attributes and does not address the ergonomics or usability of the whole product that houses a visual display.

**ISO 9241-305:2008 Ergonomics of human-system interaction -- Part 305: Optical laboratory test methods for electronic visual displays**

ISO 9241-305:2008 establishes optical test and expert observation methods for use in predicting the performance of a display vis-à-vis the ergonomics requirements given in ISO 9241-303.

**ISO 9241-306:2008 Ergonomics of human-system interaction -- Part 306: Field assessment methods for electronic visual displays**

ISO 9241-306:2008 establishes optical, geometrical and visual inspection methods for the assessment of a display in various contexts of use according to ISO 9241-303.

**ISO 9241-307:2008 Ergonomics of human-system interaction -- Part 307: Analysis and compliance test methods for electronic visual displays**

ISO 9241-307:2008 establishes test methods for the analysis of a variety of visual display technologies, tasks and environments. It uses the measurement procedures of ISO 9241-305 and the generic requirements of ISO 9241-303 to define compliance routes suitable for the different technologies and intended contexts

**ISO 9241-308:2008 Ergonomics of human-system interaction -- Part 308: Surface-conduction electron-emitter displays (SED)**

ISO/TR 9241-308:2007 gives guidelines for surface-conduction electron-emitter displays (SED).

**ISO 9241-309:2008 Ergonomics of human-system interaction -- Part 309: Organic light-emitting diode (OLED) displays**

ISO/TR 9241-309:2008 gives guidelines for organic light-emitting diode (OLED) displays.

**ISO 9241-310:2010 Ergonomics of human-system interaction -- Part 310: Visibility, aesthetics and ergonomics of pixel defects**

ISO/TR 9241-310:2010 provides a summary of existing knowledge on ergonomics requirements for pixel defects in electronic displays at the time of its publication. It also gives guidance on the specification of pixel defects, visibility thresholds and aesthetic requirements for pixel defects. It does not itself give requirements related to pixel defects, but it is envisaged that its information could be used in the revision of other parts in the ISO 9241 series.

**ISO 9241-400:2007 Ergonomics of human--system interaction -- Part 400: Principles and requirements for physical input devices**

ISO 9241-400:2007 gives guidelines for physical input devices for interactive systems. It provides guidance based on ergonomic factors for the following input devices: keyboards, mice, pucks, joysticks, trackballs, trackpads, tablets and overlays, touch sensitive screens, styli, light pens, voice controlled devices, and gesture controlled devices. It defines and formulates ergonomic principles valid for the design and use of input devices. These principles are to be used to generate recommendations for the design of products and for their use. It also defines relevant terms for the entire 400 series of ISO 9241. For some applications, e.g. in areas where safety is the major concern, other additional principles may apply and take precedence over the guidance given here.

ISO 9241-400:2007 also determines properties of input devices relevant for usability including functional, electrical, mechanical, maintainability and safety related properties. Additionally included are aspects of interdependency with the use environment and software.

**ISO 9241-410:2008 Ergonomics of human-system interaction -- Part 410: Design criteria for physical input devices**

ISO 9241-410:2008 specifies criteria based on ergonomics factors for the design of physical input devices for interactive systems including keyboards, mice, pucks, joysticks, trackballs, trackpads, tablets and overlays, touch-sensitive screens, styli and light pens, and voice- and gesture-controlled devices. It gives guidance on the design of these devices, taking into consideration the capabilities and limitations of users, and specifies generic design criteria for physical input devices, as well as specific criteria for each type of device. Requirements for the design of products are given either as a result of context-free considerations, or else can be determined based on the specified design criteria for the intended use; such specified criteria generally having been subdivided into task-oriented categories, wherever applicable.

ISO 9241-410:2008 does not specify the categories that are appropriate for devices as, according to the concept of usability, a product has no *inherent* usability. Selecting the category to which a certain property of a device belongs is subject to the design of a product.

**ISO 9241-420:2011 Ergonomics of human-system interaction -- Part 420: Selection of physical input devices**

ISO 9241-420:2011 provides guidance for the selection of input devices for interactive systems, based on ergonomic factors, considering the limitations and capabilities of users and the specific tasks and context of use. It describes methods for selecting a device or a combination of devices for the task at hand. It can also be used for evaluating the acceptability of trade-offs under the existing conditions.

It is applicable to the following input devices: keyboards, mice, pucks, joysticks, trackballs, trackpads, tablets and overlays, touch-sensitive screens, styli and light pens. It does not specify design requirements or give recommendations for those devices.

**ISO 9241-910:2011 Ergonomics of human-system interaction -- Part 910: Framework for tactile and haptic interaction**

ISO 9241-910:2011 provides a framework for understanding and communicating various aspects of tactile/haptic interaction. It defines terms, describes structures and models, and gives explanations related to the other parts of the ISO 9241 "900" subseries. It also provides guidance on how various forms of interaction can be applied to a variety of user tasks.

It is applicable to all types of interactive systems making use of tactile/haptic devices and interactions.

It does not address purely kinaesthetic interactions, such as gestures, although it might be useful for understanding such interactions.

**ISO 9241-920:2009 Ergonomics of human-system interaction -- Part 920: Guidance on tactile and haptic interactions**

ISO 9241-920:2009 gives recommendations for tactile and haptic hardware and software interactions. It provides guidance on the design and evaluation of hardware, software, and combinations of hardware and software interactions, including: the design/use of tactile/haptic inputs, outputs, and/or combinations of inputs and outputs, with general guidance on their design/use as well as on designing/using combinations of tactile and haptic interactions for use in combination with other modalities or as the exclusive mode of interaction; the tactile/haptic encoding of information, including textual data, graphical data and controls; the design of tactile/haptic objects, the layout of tactile/haptic space; interaction techniques.

**ISO 9355-1:1999 Ergonomic requirements for the design of displays and control actuators -- Part 1: Human interactions with displays and control actuators**

ISO 9355-1:1999 applies to the design of displays and control actuators on machinery. It specifies general principles for human interaction with displays and control actuators, to minimize operator errors and to ensure an efficient interaction between the operator and the equipment.

Comment: While ISO 9355-1 is mainly intended for machinery, it can be applied to the design of other equipment as well.

**ISO 9355-2:1999 Ergonomic requirements for the design of displays and control actuators -- Part 2: Displays**

This International Standard gives guidance on the selection, design and location of displays to avoid potential ergonomic hazards associated with their use. It specifies ergonomics requirements and covers visual, audible and tactile displays, and applies to displays used in machinery (e.g. devices and installations, control panels, operating and monitoring consoles) for occupational and private use.

Comment: While ISO 9355-2 is mainly intended for displays related to machinery, it can be applied to the design of displays for other equipment as well.

**ISO 9355-3:2006 Ergonomic requirements for the design of displays and control actuators -- Part 3: Control actuators**

ISO 9355-3:2006 gives ergonomic requirements for, and guidance on, the selection, design and location of control actuators adapted to the needs of the operator, suitable for the control task in question and taking account of the circumstances of their use. It is applicable to manual control actuators used in equipment for both occupational and private use.

Comment: ISO 1503:2008 should be used in conjunction with ISO 9355-2.

**ISO 11064-1:2000 Ergonomic design of control centres -- Part 1: Principles for the design of control centres**

ISO 11064-1:2000 specifies general ergonomic principles for the design of control centres.

**ISO 11064-2:2000 Ergonomic design of control centres -- Part 2: Principles for the arrangement of control suites**

ISO 11064-2:2000 specifies ergonomic principles, recommendations and requirements for the arrangement of control suites found in control centres.

**ISO 11064-3:1999 Ergonomic design of control centres -- Part 3: Control room layout**

ISO 11064-4:2004 specifies ergonomic principles, recommendations and requirements for control room layout. It covers control room design with particular emphasis on layout and dimensions.

**ISO 11064-4 Ergonomic design of control centres -- Part 4: Layout and dimensions of workstations**

ISO 11064-4:2004 specifies ergonomic principles, recommendations and requirements for the design of workstations found in control centres. It covers workstation design with particular emphasis on layout and dimensions. This standard covers primarily seated, visual-display-based workstations although sit/stand workstations are also addressed. These workstations are to be found in applications such as transportation control, process control and security installations.

**ISO 11064-5:2008 Ergonomic design of control centres -- Part 5: Displays and controls**

ISO 11064-5:2008 presents principles and gives requirements and recommendations for displays, controls, and their interaction, in the design of control-centre hardware and software.

**ISO 11064-6:2005 Ergonomic design of control centres -- Part 6: Environmental requirements for control centres**

ISO 11064-6:2005 gives environmental requirements as well as recommendations for the ergonomic design, upgrading or refurbishment of control rooms and other functional areas within the control suite. The following aspects are covered: thermal environment (temperate regions); air quality; lighting environment; acoustic environment; vibration; aesthetics and interior design. It is applicable to all types of control centres, including those for the process industry, transport and dispatching systems and emergency services. Although it is primarily intended for non-mobile control centres, many of the principles are relevant to mobile centres such as those found on ships, locomotives and aircraft. It does not cover the influence of electromagnetic fields.

**ISO 11064-7:2006 Ergonomic design of control centres -- Part 7: Principles for the evaluation of control centres**

ISO 11064-7:2006 establishes ergonomic principles for the evaluation of control centres. It gives requirements, recommendations and guidelines on evaluation of the different elements of the control centre, i.e. control suite, control room, workstations, displays and controls, and work environment.

It covers all types of control centres, including those for the process industry, transport systems and dispatching rooms in the emergency services. Although ISO 11064-7:2006 is primarily intended for non-mobile control centres, many of the principles could be relevant/applicable to mobile centres, such as those found on ships and aircraft.

**ISO 14915-1:2002 Software ergonomics for multimedia user interfaces -- Part 1: Design principles and framework**

ISO 14915-1:2002 establishes design principles for multimedia user interfaces and provides a framework for handling the different considerations involved in their design. It addresses user interfaces for applications that incorporate, integrate and synchronize different media. This includes static media such as text, graphics or images, and dynamic media such as audio, animation, video or media related to other sensory modalities. Detailed design issues within a single medium (e.g. the graphical design of an animation sequence) are only addressed as far as they imply ergonomic consequences for the user.

**ISO 14915-2:2003 Software ergonomics for multimedia user interfaces -- Part 2: Multimedia navigation and control**

ISO 14915-2:2003 provides recommendations and requirements for the design of multimedia user interfaces with respect to the following aspects: design of the organization of the content, navigation and media-control issues. ISO 14915-2:2003 is limited to the design of the organization of the content and does not deal with the design of the content in general. Design issues within a single medium (e.g. the lighting of a film sequence) are only addressed with respect to the ergonomic issues related to user controls.

**ISO 14915-3:2002 Software ergonomics for multimedia user interfaces -- Part 3: Media selection and combination**

ISO 14915-3:2002 gives recommendations for, and guidance on, the design, selection and combination of interactive user interfaces that integrate and synchronize different media. It addresses user interfaces for applications that incorporate, integrate and synchronize different media. This includes static media such as text, graphics, images; and dynamic media such as audio, animation, video or media related to other sensory modalities. Detailed design issues within a single medium (e.g. the graphical design of an animation sequence) are only addressed as far as they imply ergonomic consequences for the user.

**ISO/TR 16982:2002 Ergonomics of human-system interaction -- Usability methods supporting human-centred design**

ISO/TR 16982:2002 provides information on human-centred usability methods which can be used for design and evaluation. It details the advantages, disadvantages and other factors relevant to using each usability method.

It explains the implications of the stage of the life cycle and the individual project characteristics for the selection of usability methods and provides examples of usability methods in context.

**ISO/TS 18152:2010 Ergonomics of human-system interaction -- Specification for the process assessment of human-system issues**

ISO/TS 18152:2010 presents a human-systems (HS) model for use in ISO/IEC 15504-conformant assessment of the maturity of an organization in performing the processes that make a system usable, healthy and safe. It describes processes that address human-system issues and the outcomes of these processes. It details the practices and work products associated with achieving the outcomes of each process.

**ISO/TR 18529:2000 Ergonomics -- Ergonomics of human-system interaction -- Human-centred lifecycle process descriptions**

**ISO 20282-1:2006 Ease of operation of everyday products -- Part 1: Design requirements for context of use and user characteristics**

ISO 20282-1:2006 provides requirements and recommendations for the design of easy-to-operate everyday products, where ease of operation addresses a subset of the concept of usability concerned with the user interface by taking account of the relevant user characteristics and the context of use. This standard is intended to be used in the development of everyday products, for which it defines ease of operation, explains which aspects of the context of use are relevant, and describes the characteristics of the intended user population that may influence usability.

Comment: ISO 20282-1 was originally developed by TC159/SC1

**ISO 20282-2:2006 Ease of operation of everyday products -- Part 2: Test method for walk-up-and-use products**

ISO 20282-2:2006 specifies a test method for measuring the ease of operation of "walk-up-and-use" products. The purpose of the test is to provide a basis for predicting the ease of operation of a walk-up-and-use product, including measures of its effectiveness and efficiency of operation, and the satisfaction of the intended user population in its expected context of use.

Comment: ISO 20282-2 was originally developed by TC159/SC1

**ISO/PAS 20282-3:2007 Ease of operation of everyday products -- Part 3: Test method for consumer products**

ISO/PAS 20282-3:2007 specifies a test method for measuring the ease of operation of consumer products. The purpose of the test is to provide a basis for predicting the ease of operation of a consumer product, including measures of its effectiveness and efficiency of operation, and the satisfaction of the intended user population in the intended context of its use.

Comment: ISO 20282-3 was originally developed by TC159/SC1 and is being revised in SC4/WG11.

**ISO 24503:2011 Ergonomics -- Accessible design --Tactile dots and bars on consumer products**

ISO 24503:2011 specifies requirements for the design of tactile dots and tactile bars for use on consumer products to improve accessibility for everyone, including older persons and persons with disabilities.

ISO 24503:2011 is applicable to consumer products used by persons with visual disabilities, and in cases where visual information is not the primary sense used for accomplishing the task.