

Peter Nickel^{1,2}, Hans-Jürgen Bischoff^{1,3}, Peter Bärenz^{1,4}, Siegfried Radandt^{1,3}, Urs Kaufmann^{1,5}, Michael Wichtl^{1,6}, Luigi Monica^{1,7}, Era Poddar^{1,8}

¹WG Human Factors, Ergonomics and Safe Machines of the ISSA Section Machine and System Safety, ²Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA), ³International Social Security Association, Section Machinery and Systems Safety (ISSA MSS), ⁴Research Centre for Applied System Safety and Industrial Medicine (FSA), ⁵Swiss Insurance Institution for Occupational Safety and Health (SUVA), ⁶Austrian Workers' Compensation Board (AUVA), ⁷Italian Workers' Compensation Authority (INAIL), ⁸Manufacturing Safety Alliance of BC, Canada (MSA BC)

Introduction

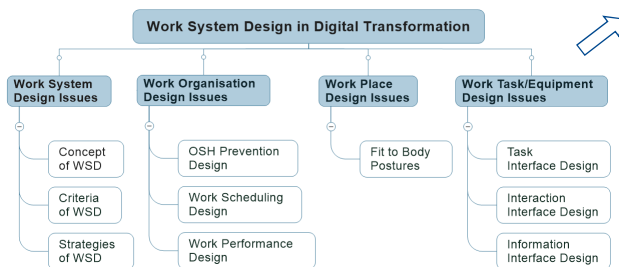
- Special Commission on Prevention of the ISSA
 - International Prevention Section on Machine and System Safety
 - Working Group: Human Factors, Ergonomics (HFE) and Safe Machines [www.safe-machines-at-work.org/human-factors/]
- WG focuses on HFE contributions to machine and system safety
 - Support construction of safe installations, inform OSH experts, instruct for HFE in risk assessment, promote good practice, foster international OSH exchange in a global world, facilitate use of national as well as international regulations and standardisation

Methods

- Work system design approach [ISO 6385]
 - Work systems comprise humans interacting together with work equipment to perform the system function in the workspace, in the work environment, under conditions imposed by the work tasks
 - HFE contributes to safety, security, health, well-being, productivity.
 - HFE calls for human-centred design of human-system interfaces
 - HFE literature, standardisation, OSH guidance e.g. from accident insurance institutions provide relevant knowledge and experience
- WG reviews knowledge and information available
 - Literature and good practise search, group presentations and discussions in WG and with OSH experts
 - Development of web platform and structure for presentation
 - Generate content on HFE and safe machines and
 - Design user guidance for human-computer interaction

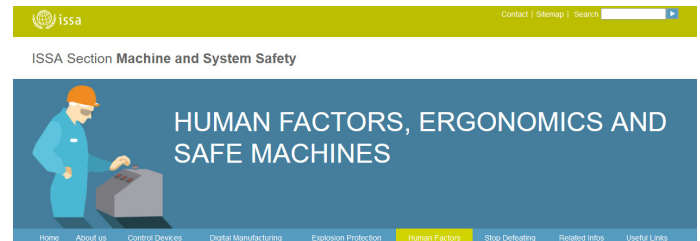
Results

- Work System Design approach
 - Information refers to dimensions in work system design
 - Guidance evolves with increasing amount of web-content available for presentation in 3 level structure
 - Structure provides orientation for relevant topics, guides through design issues, increases in detail and practice, includes references



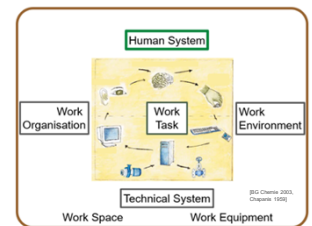
Discussion

- Internet platform available
 - Organisation of design, structure, layout by editorial group
 - More content is under development, e.g. design of displays and controls, design of work environment, support for risk assessment
 - Content required for future human-system interaction
- Invitation to participate
 - Reading, commenting, using, contributing, supporting, joining
 - Cooperation with stakeholders in HFE and machine safety
 - Contact and information: see QR code and URL



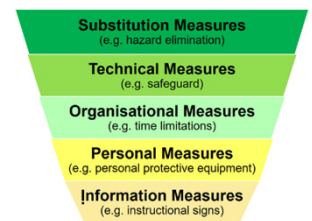
Work System Design

- Criteria of work system design
 - Feasibility of work, freedom from harm, freedom from impairments, development of health
- Strategies of work system design
 - Task orientation
 - Design for percentiles and for all
 - Prospective vs corrective design



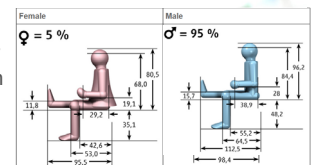
Work Organisation Design

- STOP! – OSH hierarchy of controls
 - Measures reduce hazards and risks
- Work scheduling.
 - Work process and working time.
- Work performance.
 - Human workload and human error.



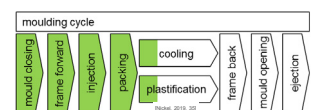
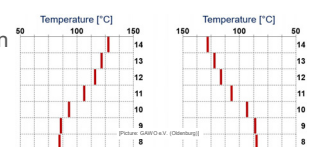
Work Place Design

- Dynamics in work place design
 - Measures to allow for line assembly works at sedentary work places with similar working height
 - Anthropometry



Work Task/Equipment Design

- Principles of task design
 - Enable feedback
 - Informs worker on system task performance to allow for assessments and adjustments (e.g. enable human to reliably assess danger zones)
- Principles of interaction design
 - Conformity to user expectations
 - Of functions, movement and position of displays and controls (e.g. population stereotypes)
- Principles of information design
 - Detectability
 - Informs human perception about information available, attracts attention, instructs about temporal sequence, shows continuity, indicates controls



Additional information:

Nickel, P., Bärenz, P., Bischoff, H.-J., Monica, L., Kaufmann, U., Wichtl, M., Poddar, E. & Radandt, S. (2021). Work System Design in Machine and System Safety with a Focus on Human-System Interaction. Lecture Notes in Networks and Systems (LNNS) 222, 154-160. [10.1007/978-3-030-74611-7_21]

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