PS3.5 Ergonomics of machinery

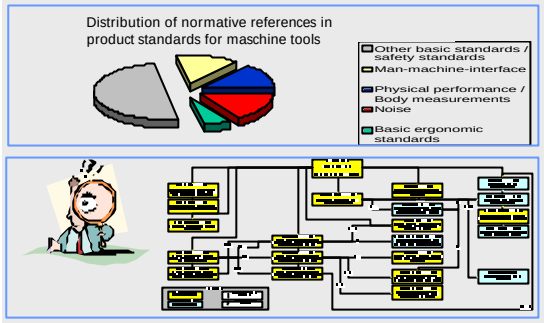
Testing and certification of the ergonomic machinery design

Project information

Development of a checklist for testing and certifying ergonomic machinery design

- Research institution : Institute for Occupational Safety and Health – BIA (of HVBG)
- Financed by: German Federation of Institutions for Statutory Accident Insurance and Prevention (HVBG)
- Status: ongoing since 12/2002
- Further information : http://www.hvbg.de/e/bia/pro/pro1/pr5088.html
- Project manager: Dr. Michael Huelke, BIA, Division 5: Accident prevention – Product safety, e-mail: michael.huelke@hvbg.de

Ergonomic references (machine tools)

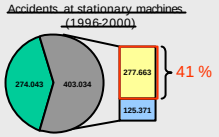


Main reasons for the project

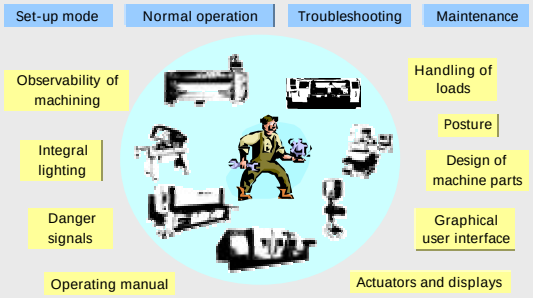
- Machinery Directive 98/37/EC, Annex I calls for ergonomic aspects to be considered . Testing and certification bodies conducting type tests certify also compliance with ergonomic requirements.

  „1.2.2 d) Under the intended conditions of use , the discomfort, fatigue and psychological stress faced by the operator must be reduced to the minimum possible taking ergonomic principles into account. “

- A large number of accidents (approx. 41%) occur while stationary machines are operated functionally correctly. One of the reasons could be wrong behaviour of the operator because of insufficient ergonomic design .



Machines/ergonomic aspects considered



Key challenges

- The relevant ergonomic requirements must be identified for the machine tools under consideration.
- The aim is to define simple, objective criteria for visual checkups or measurements.
- Ergonomic novices must be able to use the checklist.
- Going through the checklist must require as little time as possible to be acceptable for the practitioner.
- In addition , there must be a balance between ergonomic and safety technical requirements.

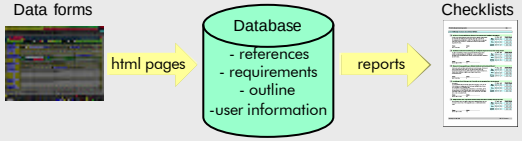
Features of the checklist (comparison)

	Checklist for testing of the ergonomic machinery design, BIA	Checklist for classification of machines according to ergonomic principles, ISSA	EN 13861, Safety of machinery, Application of ergonomics standards
Purpose	For testing and certifying	Exploratory analysis of ergonomic aspects	Guidance for application of ergonomics standards
Primary users	Test and certification body	Designer of machinery	Designer of machinery , Standards committee
Machine type	Selected machine tools	All	All
Hazards	Relevant ergonomic of the machines considered	All ergonomic	All ergonomic
References to standards	?	?	?
Refer. to test equipment	?	?	?
Criteria, limiting values	?	?	?
Test procedure	?	?	?
Test instruction	?	?	?
Assessment schema	?	?	?

First hands-on experience

- There is a sufficient number of directives and standards on ergonomics, with only a few exceptions (process observability).
- This variety of information is difficult for the designer to grasp , especially because product standards themselves hardly ever contain ergonomic details but refer to other sources.
- A hierarchy of ergonomic measures is difficult to establish due to a lack of empirically reliable data on the cause-effect-relationship between ergonomic criteria and accidents.
- Many ergonomic criteria can only be evaluated against the background of machine operation , taking into account work organisation and workplace conditions.

Use of a database procedure



- Job-sharing between members of an interdisciplinary team.
- Automatic generation of differentiated checklists.
- Possibility of checklist updates in the case of standards being amended .
- Possibility of checklist supplements to include further ergonomic criteria or machines.

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