Towards a ‘European Statement of Principles‘ adaptation to PTW technology

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Objectives

- Development of guidelines concerning the design of a safe and comfortable HMI of single and integrated ARAS and OBIS applications
- Targeted at designers to avoid information clutter, interferences with the primary task of riding and promote efficient use
- Provide a framework for the ergonomic evaluation of ARAS/OBIS applications
Background

- **European Statement of Principles (ESoP):**
  - EC recommendation finally adopted in 28 July 2008
  - Overall design goals and design principles for the HMI of In-Vehicle Information and Communication Systems (IVIS)
  - Recommendations for use and implementation

- **eSafety Working Group HMI (2009):**
  - Review the state-of-the-art and the technological progress made since the recent adoption of the ESoP to verify whether the ESoP’s scope is still suitable or needs enlargement
  - *Based on the consensus, the WG-HMI should conclude whether an update of the ESoP 2008 can be recommended or not.*
Background

- The WG HMI Final Report was submitted to eSafety SG in October 2009.

- Because the perspective of the ESoP (2008) is that of vehicle with a passenger compartment it was recommended in this report to leave PTWs provisionally out of the scope.

- eSafety WG HMI Final Report, page 7: „The ESoP should continue to exclude motorcycles. This issue should be re-examined when results and recommendations from the SAFERIDER project are available. At that point the option of developing an ESoP specifically dedicated to the PTW domain could be considered as well.“
Philosophy

- General approach of the SAFERIDER Guidelines:
  - Agreement that format of the ESoP is appropriate, i.e. high-level design goals
  - Good HMI practice needs to be developed by proper scientific investigation.
  - Consistent with the ESoP no specific pass/fail criteria e.g. in terms of glance behaviour, workload etc. are provided. The problem of verification and testing is addressed by examples of current best practice.
SAFERIDER HMI Guidelines

- Structure and Format:
  - Introduction: Motivation for the Guidelines and background information on the ESoP
  - Scope: ARAS and OBIS intended to be used while the vehicle is in motion, vehicle category L, restricted to HMI issues.
  - 18 definitions of core concepts
  - 20 Principles applicable either only for ARAS or only for both OBIS or both
  - Recommendations on how to use the Guidelines and future work
  - Technical References
  - Normative References
  - 3 informative Annexes
Example – applicable to ARAS:

- Principle: “Warnings should be presented in a manner that is compatible with the rider’s control actions needed to properly respond to the situational demands.”

- Explanation: “The concept of compatibility, more precisely SR-compatibility describes the appropriateness of the mapping of displayed information to operators’ control actions (c.f. Wickens & Hollands, 2000). ... Violations of the principles of compatibility result in increased information processing requirements in terms of recoding and make operators’ responses slower and more error prone (Sanders & McCormick, 1993). ...”

- Verification: “Because compatible SR-relationships are not obvious in any case experimental identification in simulator tests is recommended (c.f. Sanders & McCormick, 1993).”
Example – applicable to OBIS:

- Principle: “When feasible, riders should have the option to set up the presentation of information (visual, auditory, tactile) accordant to their needs, workload and individual preferences.”

- Explanation: “There are considerable individual differences among motorcyclists with regard to riding experience, motives for riding and patterns of use (e.g. Jamson & Chorlton, 2009). ... Therefore the advantages of personalised HMI solutions should be recognised and adjustments of settings should be made possible, of course within safe limits and during standstill. However, all such adjustments/personalisation should not conflict with other principles in this document.”

- Verification: “Expert judgement is recommended.”
Example – applicable to ARAS and OBIS:

- **Principle:** „Tactile information elements (vibrations, sustained pressure) should be easily detectable and distinguishable for the rider from the vehicle’s vibrations and/or possible other exterior tactile stimulation as e.g. wind.”

- **Explanation:** “The detection of a vibrotactile information element or active tactile message is possible if the stimulus applied exceeds a certain perceptual threshold which depends on several parameters as e.g. the frequency, amplitude and in particular the location on the body, i.e. if hairy or glabrous skin is stimulated (Hale & Kanney, 2004). Highest sensitivity has been found for frequencies between 150 and 300 Hz at all locations of the body. .......”

- **Verification:** “User testing under realistic and “worst case conditions” is recommended.”
Conclusions:

- The Guidelines are a first attempt to close a gap in the area of existing HMI guidelines.
- The Guidelines should prove their worth and be subjected to regular revision based on practical experiences.
- Following the recommendations of the WG HMI October 2009 the issue of an ESoP specifically dedicated to PTW could be re-examined.
- Following the basic philosophy of the Guidelines future revisions should also be based on sound results of Human Factors research in the PTW domain.
Thank you for your attention!