

VIRTUAL REALITY AND HUMAN FACTORS APPLICATIONS FOR IMPROVING SAFETY

Head of project: Prof. Simone Colombo, Politecnico di Milano

Partners: 44 partners including industry like: Total, Shell, Statoil, BP, VÚRUP, a.s. (A. Mičíková, PhD)

VIRTHUALIS is the largest European Research Project on Industrial Safety, which aims at producing an innovative technology that integrates Virtual Reality and Human Factors methods, to improving safety in production plants and storage sites.

It is common to attribute as many as 90% of major accidents in high-risk productions, such as the chemical and petrochemical industries, to human error, see www.virthualis.org, www.kib.stuba.sk/view/detail_mp.php?id=316

The overall objective of the VIRTHUALIS project is to reduce hazards in production plant and storage sites by addressing end-users' practical safety issues, such as training control room operators, designing proper alarm systems, training teams to cope with emergencies, assessing the impact of plant modifications on operators' reliability, helping managers to see the impact of their decisions on sharp-end operators' daily work, through the development of an innovative technology. The new technology will be achieved by merging Human Factors (HF) knowledge and Virtual Reality (VR) technologies. The innovative character of the VIRTHUALIS technology will be mainly given by the new HF knowledge that will provide both solutions to cope with identified safety-critical issues and the "driving license" to profitably exploit VR technologies.

The breakthrough offered by the VIRTHUALIS technology relates to the opportunity of moving from static paper-based assessments to dynamic virtual simulations. Safety analyses like HAZOP, FMEA, Fault Tree (FT), Event Tree (ET), Preliminary Hazard Analysis (PHA), Task Analysis (TA), in which critical situations are just imagined by safety analysts, will be represented in such a way that HF concepts can permeate people's mind through images. In particular this will allow safety analysts to easily and quickly understand and integrate HF concepts into safety analyses.

This will enable to improve the efficiency of safety production at any of the 7 stages of the production lifecycle, i.e., (1) Exploration & Drilling, (2) Design, (3) Construction, (4) Commissioning, (5) Operation, (6) Maintenance, Repair & Modification, and (7) Decommissioning.