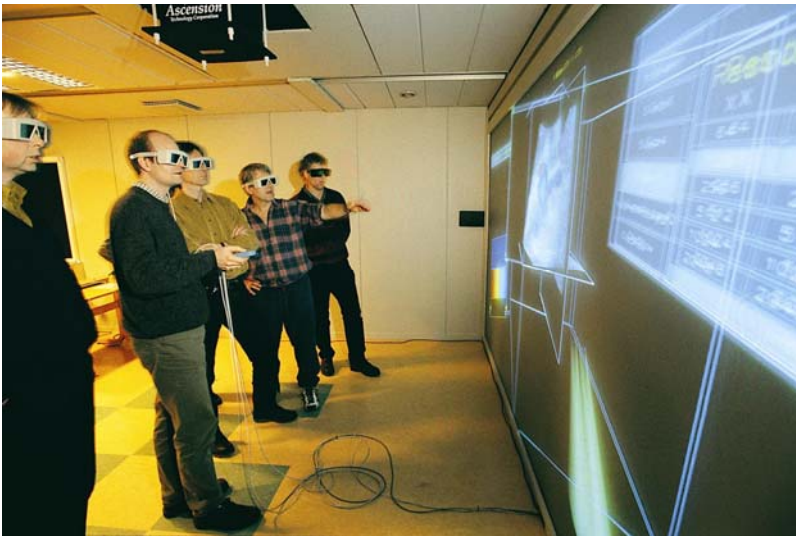


Virtual Reality and Human Factors (VIRTHUALIS)

The EU FP6 funded European programme VIRTHUALIS, in which SRISL was a main participant, ran from 2005 to 2010. It dealt mainly with the *reduction of 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; all this has been achieved through the development of an innovative technology, which has merged Human Factors (HF) knowledge and Virtual Reality (VR) technologies. The innovative character of the VIRTHUALIS technology has mainly been given by the new HF knowledge, such as the Failure Probability Estimator (FPE) tool developed mainly by the SRISL personnel, that provided solutions to cope both with identified safety-critical issues and the "driving license" to profitably exploit VR technologies. The new HF knowledge has been produced *ad hoc* to cope with two specific case studies, one at a STATOIL gas handling site in Norway and a second at a SONATRACH LPG handling site in Algeria.



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, are now moulded in such a way that HF concepts can permeate people's mind through images. In particular this allows safety analysts to easily and quickly understand and integrate HF concepts into safety analyses. Indeed, HF issues are difficult to communicate, to understand and to envision owing to their complex nature. By immersing sharp-end operators, teams, safety analysts, managers into Virtual Environments (VEs) suitably modelled for the specific analysis to perform, it is possible to "almost" experience safety-critical situations amplifying people capabilities and enabling them to suitably exploit HF concepts when performing safety analyses. Existing and new HF knowledge, created to cope with the above mentioned safety cases, have been exploited to enable:

- ✚ operator's performance tracking and his/her reliability measuring;
- ✚ new design alternatives to be conceived and created;
- ✚ informed safety-critical decisions to be made effectively;
- ✚ appropriate and effective training programs to be created.

The VIRTHUALIS methodology ultimately enables industry 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.

Especially during 2009 the main thrust of the consortium and SRISL effort was put to the finalisation of the second case study in SONATRACH, Algeria.