



CENTER FOR OPERATOR PERFORMANCE

An Industry/University
Center for Excellence

Fall 2009 Meeting

The fall meeting of the Center for Operator Performance was held November 3-5 at Chevron's Research & Technology Center in Richmond, California. New officers were elected in Dave Boychuck (SUNCOR) and Ike Brackin (FHR). Special thanks were extended to Mark Nixon (Emerson) for leading the center through the critical kick-off years. First timers at the conference included new member BP and guests from Dow Chemical, Shell, Tesoro, and Pro-Sys.

In addition to material on Center finances and marketing to date, presentations were made on projects in progress, operator display research at member companies, and research being done in the defense/aerospace domain.

Projects in Progress

Dr. Jennie Gallimore (Wright State) updated the group on her project to develop a systematic way to define display content and structure. A matrix of operator decision and process variables has been created in which operators will rate the importance of the variable to the decision. Cluster analysis will then show preferred groupings of the data.

Dr. Sandeep Purao (Penn State) reviewed initial data collection on Knowledge Management and outlined five potential research directions: (1) user-friendly procedures for novices/experts, (2) mechanism to capture and share process learning events (stories), (3) connecting near-miss events to simulators/what-if drills, (4) creation of troubleshooting guides from procedures, and (5) creation of procedures with multiple views to match situation need.

Activities at Member Companies

Chevron is working on both design and operational metrics of display system "goodness." The design metrics are such things as display density and keyboard demand. Operational metrics would be collected on active systems and include such things as effectiveness in responding to an event.

Flint Hills Resources demonstrated the decision making exercise (DMX) technique. Methods to ease implementation at member sites are to be developed.

Emerson's work on eye-tracking was presented by Texas State University. Alternate designs of the Delta V were tested for ease of display use based upon mouse and eye movement.

NOVA Chemical demonstrated the use of a multidimensional data visualization technique to identify compressor failure far in advance of traditional alarming methods.

State-of-the-Art Research

Dr. Harvey Smallman (Pacific Science and Engineering Group) presented current research on how performance degrades with excessive graphic detail in an effort to make displays seem "realistic." A strong correlation has been found with the desire for extraneous detail and low spatial abilities. New methods to add change data to aviation graphics without the use of trends was also presented.

Dr. Kathleen Mosier (San Francisco State) highlighted research in automation trust and bias, presenting cases where disastrous actions were taken at the urging of a decision support system. Cause of the bias is a function of over-trusting the system and the saliency of the displays.

The Spring meeting will be held at Wright State University. Presentations will include alarm rate research and Marathon's standardized training program.