

The Spring meeting of the Center for Operator Performance was held April 21-23 at Wright State University in Dayton Ohio. Industry members Chevron, Flint Hills Resources, Marathon, NOVA Chemical, and SUNCOR Energy were present along with DCS & software suppliers ABB, Emerson, and PAS. Guests from Husky Energy and Electric Power Research Institute were present for the technical sessions. Beville Engineering served as the industry-academia liaison.

The results and status of projects were presented, including -

Alarm Actuation Rate Study – Dr. Craig Harvey (LSU) presented the results of his study in which different rates of alarm actuation were presented to LSU students using a pipeline simulator with different alarm summary formats.

Performance was equal on the four lowest alarm rates, but a statistically significant degradation was seen with the highest. However, the degradation was not as severe when the alarms were grouped by priority as when shown purely by time of actuation. The difference in performance with the two formats was also statistically significant.

Mapping Decisions to Displays – A previous study on color usage indicated that color was not as great of a problem as was poor organization of the display content. Dr Jennie Gallimore (WSU) outlined the approach that was going to be using on a Hydrocracker to determine if a better way to aid in content determination could be used. A matrix of key decisions would be mapped to the relevant value of information. A cluster analysis would then identify likely display groupings.

Virtual Control Room – A 3D example of a control room was demonstrated on a PC. A tour was then conducted of the virtual reality cave that could made those images life size for evaluating design options.

Knowledge Management – Dr Sandeep Puroo (Penn State) elicited input/direction for his project in knowledge management (KM). Near miss reports will be the starting point for application to a hydrocracker. The goal will be a near real time aid capturing current hardcopy data that does not require significant changes to how the operator current performs their job.

Data Mining – Examples of how data mining has been used to discover previously unknown relationships in data was presented by Dr. Yan Liu (WSU), such as the strong link between people who buy diapers tending to buy beer. Use of data mining to identify what operator variables affect plant performance was discussed.

Decision Making Exercise (DMX) Experience – Ike Bracken (Flint Hills Resources) described their development and application of DMX exercises that were a product of the Center's first two projects. In addition to being easy to develop and requiring only an hour to apply, everyone participating expressed having learned something, although what was learned was different for each person.

Electric Power Research Institute Collaboration (EPRI) – Recent research at EPRI was discussed as a possible prelude to working together on future efforts.

New Research - A project to investigate early detection of compressor problems by Dr. Ellen Bass of University of Virginia was unanimously approved.

New RFPs – Three new RFPs are being prepared: (1) Develop Operator Performance Metrics for use in assessing the improvement from enhancements to the operator-process system (displays, alarms, training, and procedures), (2) application of Dr. Harvey's alarm study to actual operators over a two hour period, and (3) mapping near miss reports to process data in order to determine lessons learned.