

## Proposal Summary

The pilot effort conducted for the Center for Operator Performance showed that, while existing simulators offer valuable content to trainees, they do not fully represent the operator performance environment (e.g., diagnosis of events, decision making, and problem detection). The formal experiment proposed here is designed to address this challenge. The goal is not to dismantle existing simulators. Rather, this experiment is designed to measure the value of supplementing existing simulators with low-fidelity (e.g., paper-and-pencil based) Decision Making Exercises (DMXs) of the environment that more accurately reflect decision-making challenges. This training approach provides opportunities to participate more often in simulated decision tasks with no threat to safety and less expense.

## Anticipated Benefits

Research has shown that the application of Cognitive-Task Analysis based training can cut training time in half (including design, training of presenters, and delivery).<sup>1</sup> The goal of this experiment is to assess the economic and training impact of utilizing CTA-based training scenarios in the process industry. This experiment will also allow us to collaborate with members of the process industry to train our scenario development methodologies, contributing to sustained performance. This scenario-based training experiment will:

- § show the value of leveraging cognitive-based training scenarios to build expertise
- § measure such variables as *time* (e.g., how long does it take an operator to execute a desired action); *application of learning* (e.g., is the content currently presented in training programs being translated accurately on the job); and *problem detection/situation awareness skills* (e.g., are operators picking up on key problem indicators quickly or do they wait for multiple indicators before responding).
- § show the economic value of supplementing larger simulators with low-fidelity scenarios
- § identify potential areas and ways in which training time and cost can be minimized
- § provide train-the-trainer support through sharing the process for developing and facilitating Decision Making Exercises (DMXs) to support sustained performance for the Center for Operator Performance and the larger process industry. We will accomplish this through working collaboratively with a Technical Consult from the process industry.

---

<sup>1</sup> Clark & Estes (1999) The Development of Authentic Educational Technology. Educational Technology.