

Statement of the Issue

To provide guidance on design, layout and human-machine interaction to support operators in running a process control room.

A major oil and gas production company were seeking to design and build a control room for a new onshore processing plant. There were high safety risks due to fire, explosion and gas emission. Also, production stoppages of even a few hours would mean substantial loss of revenue. The company therefore wanted to ensure that the operators would be supported in their tasks by human-centred design of the control room. This was to reduce the risk of human error and avoid fatigue and discomfort.

Solution

Basic design plans, including drawings of the planned control room layout and equipment fit were supplied by the customer. To provide further information on operator activities a structured meeting was held between the Hu-Tech analyst and a project engineer, instrumentation engineer, safety design engineer and experienced operator from the company. The meeting also investigated ways in which the design and organisation of the control room could support the operator during normal running, maintenance and emergency conditions.

The project team used information about process and operator goals to make recommendations for the equipment functionality and layout, and displayed information content and format. Ergonomic and control room design standards were used to ensure that the environment would support the operators comfortably. Finally, activities for the project team in the detailed design and construction phases were drawn up. These included refining the software user interface, determining training needs, and auditing

that would provide assurance to the customer that the design met ergonomic standards and good practice.

Significant outcomes

Earlier plans to provide more operators were changed because it was found to be feasible (given task demands and operator workload) to use fewer multi-function consoles that required a smaller control and monitoring team. This opportunity was made possible because analysis to match personnel, equipment and organisation was done sufficiently early in the design cycle, before project engineering commitments had been made.

Experience from other process control room work (in offshore, pharmaceutical and military domains) was drawn upon to provide solutions to support team communication and smooth workflow, leading to more efficient processes with reduced risk of human error.

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