



User Centered Design Services, Inc.

Corporate Brief

Our Vision:

User Centered Design Services, Inc. is a consulting company focused on *Operational Excellence*.

Our vision is to implement Best Practice solutions for reducing the frequency and severity of abnormal situations, which will dramatically improve the nature of operations in production facilities. These Best Practices impact all aspects of plant operation and will result in improved plant performance, a reduction in incidents, and improved safety and profitability.

The Situation:

Abnormal situations encompass a range of events outside the “normal” plant operating modes, e.g. trips, fires, explosions, toxic releases or just not reaching planned targets. The early work of the Abnormal Situation Management Consortium® included a survey of the US petrochemical industry. Based on their research the consortium estimates industry losses of around \$20 billion per year from abnormal situations, approximately equal to the total annual profits of that industry. A variety of evidence led to this estimate:

- Plant surveys show that incidents are frequent, with typical costs ranging from \$100,000 to well in excess of \$1 million per year. One plant surveyed had 240 shutdowns per year at a total cost of \$8 million. Many of these shutdowns were preventable.
- They found that refineries suffer, on average, a major incident once every three years costing on average \$80 million.
- One insurance company's statistics shows that the industry is claiming, on average, over \$2.2 billion per year due to equipment damage. It is likely that actual total losses to the companies are significantly higher than what is claimable.

Further, these studies by the Abnormal Situation Management Consortium® indicate that companies achieving Best Practices in operations can improve productivity by 5-12%.

What We Do:

User Centered Design Services offers a full line of consulting services to evaluate your current plant condition, make realistic and achievable recommendations for improvement, and aid you in implementing our recommendations. Our major service offering are:

Overview

- **Management System Gap Analysis** – We compare site management systems in detail to Best Practices and identify improvement opportunities. This is the same study that each ASMC member company has completed as part of their membership fee.

People

- **Console Operator Staffing Assessment** – We evaluate the number of console operators and workload for each, benchmarking each versus the site, industry and Best Practice. We then make recommendations for rationalization.
- **Field Operator Staffing Assessment** – We evaluate the number of field operators and workload for each, benchmarking them versus the site, industry and Best Practice. We then make recommendations for rationalization.
- **Work Team Design Assessment** – We assess the overall structure of the Operating Department and make recommendations for improvements.
- **Management of Organizational Change Services** – We educate and train the client on a methodology to implement staffing realignments and consolidation, while ensuring that safety and reliability are not compromised.

Workspace

- **Control Building Conceptual Design** – We conduct a high-level look at new or retrofit control building projects to ensure that all the site needs are considered and Best Practices are incorporated into the design. We develop an overall scope, vision and direction for the project.
- **Control Building Detailed Design** – Through a detailed look at specific issues for a new or retrofit control building projects we generate a document that will enable any Architect to design a control building which incorporates Best Practices.
- **Field Shelter Design** – Using a functional requirements approach we develop user centered designs for new and retrofit field shelters, along with a $\pm 30\%$ cost estimate.

Management Systems

- **Alarm Management Services** – We offer a complete line of services to improve the performance of your plant alarm system. Through a detailed assessment of your alarm management philosophy and alarm management practices we identify opportunities and methods to reduce standing and nuisance alarms, resulting in fewer operator errors. This, in turn, leads to reductions in near misses, incidents and accidents.
- **Human-Computer Interface Services** – We offer a complete line of services to improve the performance of your plants human-computer interface. In our detailed assessment of your control information philosophy and practices, we evaluate the number of screens necessary for operation and the quality of the information presented. Poorly designed graphics can increase the mental workload of operators by 10% and the time required to detect significant information by more than 25%.

Other

- **Engineering Services** – We offer these additional engineering services to meet our client's needs:
 - **Console Design** – Detailed design of operating and off-workstation consoles which incorporates the latest in ergonomics and operator alertness techniques.
 - **Feasibility Studies** – We can perform studies to assist the client in gathering information to present to Management to aid in justifying new projects.
 - **Automation Upgrade Consultation** – UCDS automation consultation will give you a vendor-neutral evaluation of your opportunities for improvement in control technology.
 - **Architect and Vendor selection** – We bring our extensive experience to aid in evaluating and selecting Architects, instrumentation and controls companies, I&E contractors, graphics implementers, advanced application software, operations and business support software, control consoles and furniture, overview screens, and plant communications equipment.
 - **Expert Witness** – We offer our expertise to assist you in addressing your legal issues. In 2000 we represented a major Refiner and helped the legal council understand Industrial Practices and the role of human error in a critical incident.
 - **Workshops** – UCDS can offer workshops in most of the subject areas we specialize in, including ASM Best Practices, Situational Awareness, Human-Computer Interface design, Alarm system management, and control building design. These workshops are an excellent way to introduce these concepts to your organization, educate stakeholders, and help form a vision for future plant improvement.
 - **Training** – We come to your site to provide detailed training to your personnel on any portion of the ASM Best Practices. Through our associate, TTS Performance Systems, we can provide best in class training at all levels of your organization.
 - **Job Task Analysis** – We use an analytical process to determine the specific behaviors required of humans in operator-machine systems. We determine the detailed performance required of people and equipment, as well as the effects of environmental conditions, malfunctions and other unexpected events on both. Within each task to be performed by people, we analyze the behavioral steps in terms of 1) information presented to, and received by, the workers; 2) their processing of that information (and previously stored information, goals, intentions, etc.) to interpret the system status and to decide what action, if any, to take; and 3) required worker inputs to the system (which includes other workers as well as the equipment).