USER CENTERED DESIGN SERVICES, INC.
ACHIEVING EXCELLENCE IN OPERATIONS

BBB ACCREDITED BUSINESS

SERVICE BRIEF:

User Centered Control Building Conceptual Design

The Situation:

Are you thinking it's time to invest in your controls and control buildings?

Maybe the current control rooms in your facility are old, and in need of extensive refitting. Maybe API-RP752 says your existing buildings are too close to the units and aren't built to blast resistant standards impacting occupancy thresholds. Maybe you're about to invest in a major reinstrumentation project and would like to optimize your spending. Perhaps you're thinking about building a central control room. Maybe you have heard about competitors building large centralized control rooms with large off-workstations creating a theater style building bringing the big picture back to control operators. You know a lot of research has been done on managing abnormal situations and on getting the most out of your console operators, and you would like to make sure you take full advantage of it.

You have a good Project engineering group but they aren't experts in this type of project. You have a person who did a control room project and is considered an expert, but that experience is based on one project. And that project was never reviewed for what works well and what doesn't, such as poor traffic flows, HVAC issues, bad lighting, poor console adjacencies, poor room adjacencies. Who has the resources to become an expert in field that you only invest in every 30 years? There *has* to be a better way of handling this type pf project but how? What should you do? What should you *not* do? How do you make sure you're getting the highest return on your investment and getting the biggest benefit at the lowest cost? What Industrial Standards, Guidelines and Practices should be considered? You don't want to create control rooms that have problems similar to your existing buildings. With 24-hour shift operations you require the best practices around ergonomics and human factors to ensure safe production.

The Solution:

Driven by today's demands for safer, more reliable, cost effective and efficient operations, control room designs are relying more heavily on automation and centralized supervisory control. The operator however, has retained a critical role in making these systems work. With our extensive engineering experience, and working relationship with many different architectural firms, we have been involved in over a hundred control room projects ranging from small refits of existing buildings to construction of state of the art distributed and consolidated control rooms.

User Centered Design Services can help you through the evaluation process by:

- Developing a shared vision by defining the needs and requirement or your organization
  - What is Management's vision for the site
  - Who's in the building and who's out?
  - What sort of facilities should be included?
  - What types of fatigue countermeasures should be used?
  - What rooms are required?
  - What should the room adjacencies be?
  - What do you do with your existing buildings?
- Determining the best locations, number and style of control room(s)
  - Safety, environmental, security
  - Local or remote
  - Single central control room or multiple remote control rooms
  - Functional layout or theater layout
  - Within the battery limits or outside
- Reviewing your current practices and how they will be impacted by a new facility
  - Expectations of Operators
  - Organization and Culture
  - Impact on existing Management systems (procedures, training…)

- Identifying areas to improve the operator's ability to detect, diagnose and respond to an abnormal situation.
  - Impact and potential re-use of existing console furniture
  - Ergonomics
  - HVAC and Lighting
  - Noise control
  - Traffic flow

The Process:

Our process begins with a few phone conversations to determine the scope of the project, and then we schedule a site visit. Typically, two representatives from UCDS will visit the site, depending on site size and project scope. These visits usually last a week although they may run longer or be staffed by more UCDS personnel if required.

During this initial visit, UCDS will conduct extensive interviews with a wide cross section of plant personnel from Senior Management to plant operators. This process generally will involve 60+ interviews. All interviews usually require an hour to perform and cover day organization and shifts. We prefer to interview Operators at their duty stations. This puts the operators more at ease, allows them to physically show us things important to them, and minimizes scheduling issues and overtime costs for the Client. We recommend early involvement of the Union, if applicable; we have developed a strong collaborative working relationship with PACE representatives and members over previous studies and frequently met with Union Reps at the start of the project.

After the site visit, UCDS will require a short period to analyze the data and generate a report. This report will contain a full analysis of the results of the interviews, including recommendations on dozens of areas to be considered during the project. Also included will be a conceptual bubble diagram of possible new building room concepts and adjacency relationships for all identified rooms in the building, preliminary room sizes if known, and an order of magnitude budget for the next phase of the project. This is not a full list and does not have the details for room size, which would be difficult to do as the customer may not know space requirements such as how many computers in the computer room at this point in the project but is good for a ± 30% budget figure. We allow for a couple of edits of this document after site review. If desired, UCDS can return to the site to present our findings to Management.

Benefits:

This process provides a structured, rational way to begin a project that most facilities may attempt only once in twenty or thirty years. User Centered Design Services brings knowledge and experience from a broad industrial base to bear on your facility. A properly designed facility can increase operator performance, reduce work-related stress, reduce human errors, improve safety, reduce upsets, slowdowns and shut downs, and contribute significantly to the bottom line of the plant.

Related Services:

Frequently when a Client is considering a project of this type, they also are interested in reevaluating their staffing levels. User Centered Design Services is uniquely qualified to help clients identify potential operator rationalization and consolidation cases for both console and field operators by performing a ***Console Staffing Assessment*** and a ***Field Operator Staffing Assessment***. We also can assist in helping determine the optimum make-up of the operations work team through a ***Work Team Design Assessment.*** Please see the Service Briefs for more information on any of the services.

The Conceptual design site visit also offers a good time to perform a ***Management System Gap Analysis.*** This analysis can identify other potential areas of opportunity for improvements in the plant operation. When combined with the Conceptual design visit, savings can be realized in travel and labor costs.

User Centered Design Services also can assist in developing the project justification and help to setup the project team. More information is available in the ***Engineering Services Brief***.