



## **More Than Just Pretty Pictures - BBBB (Buy)**

### **ASM Consortium Guidelines: Effective Operator Interface Design**

By ASM Joint R&D Consortium

Reviewed by Nick Sands

One of the first organizations to address the design of control system displays was the Abnormal Situation Management Consortium (ASM). The group formed between 1992-1994, evolving from a task group of Honeywell users concerned about alarm system performance to an organization that includes user companies, technology companies and universities that also addresses other issues of user-control system interaction. ASM members developed the guidelines on Effective Operator Interface Design, but until recently the document was available only to member companies. It provides a list of 81 guidelines, grouped into 16 categories, and prioritized for relative importance.

Several categories target the organization of displays including; display types, display content, display style, display layout, and navigation. One of the important concepts is a well structured display hierarchy that provides levels of information from overview to detail. They recommend displays be designed and organized to support operator tasks. A guideline on animation and detailed drawings states they should be used by rarely, except in the case of alarm indications. A consistent layout suggested, like process flows moving left to right, increases clarity and the navigation from one display to another should be simple and clear to the operator.

The use of color, symbols and process connections, text and numbers, and the interactions with displays are categories related to display design. The guidance is to use a minimum of colors, less than seven, and use them consistently, with bright colors used only for alarms. Also, the number of symbols and line weights should also be limited and used consistently. They point out that text should be readable from the operator's position, and the meaning should be clear. Consider too that entry of data can be error checked and commands should be quickly acknowledged.

Alarming is always a topic of concern in HMI design and several guideline categories address it, including; alarm configuration schemes, audible and visual annunciation of alarms. In addition to reserving bright colors for alarms, it is recommended to use symbols for alarm and to ensure they are visible at all times. Also, the operator should be able to see the alarms that are disabled or inhibited if needed. There is also guidance on the relative volume for audible alarms.

Several categories briefly address some of the work process aspects of HMIs with topics like training, online user assistance, design methodology, and management of change. The guidance includes getting user involvement in the development of displays and including task analysis, and then training on the product HMI. Also, when changes are made, the users should receive notice. A recommendation is to have some level of help screens or other online assistance for the users.

These guidelines will help many users to develop or improve their HMI. There is a very good introductory section on abnormal situations and a final chapter on determining conformance to the guidelines. A salute to the ASM Consortium for sharing their Effective Operator Display Design guidelines with the world. While it is Honeywell-centric at times, there is plenty of excellent guidance to make it worth buying (BBBB) for any automation professional that works on control system. It is available from Amazon.com for ~\$115US.