



Light Lifting- BB (Boring)

Human Factors Methods for Improving Performance in the Process Industries

From CCPS

Reviewed by Nick Sands

The science of human factors has made significant contributions to process safety and to the improved design of control system Human Machine Interfaces (HMIs). *Human Factors Methods for Improving Performance in the Process Industries*, a new book from Center for Chemical Process Safety (CCPS), provides a broad overview of the many ways human factors affect a process plant. The book was a collaboration of several authors from different companies that support CCPS, an organization within the American Institute of Chemical Engineers (AIChE).

The introductory chapters begin with a definition of human factors; the interaction of individuals with each other, with facilities and equipment and with management systems. A model shows how human error in organizations, equipment design, work systems, and in people themselves can allow hazards to result in accidents. Better application of human factors should reduce the frequency and severity of accidents. A list of some major accidents is used to build the case for human factors. But measuring improvements can be tricky, since many safety key performance indicators (KPIs) are vaguely related to human factors, though some, like the number of ergonomic injuries are more strongly related.

A set of chapters is dedicated to human factors considerations for facilities and equipment, which includes the design of equipment to match the capabilities of workers. Of particular concern is the design of the control rooms, the control systems, and the HMI (or Human Computer Interface, HCI) to support effective operator responses to abnormal situations. A short chapter highlights design issues for each system. Labeling of field equipment, valves, and controls should be carefully thought out. The last of these chapters addresses many factors for safe havens.

Another section of the book focuses on people, starting with the elements of an effective training program. The topic continues with a focus on communications, as in the clarity of shift logs, turnover communications, and the design of operating procedures, which is critical to avoiding operating incidents from simple misunderstanding. Environmental factors like temperature, light, and vibration affect the performance of people, and the more so with increasing age. Work schedules or increased overtime can also affect operator performance. A common area of injuries also addressed is related to manual materials handling, like the lifting of drums of materials.

The final chapters are directed to management systems, the most important of which is the establishment of a safety culture. This can include a review of project plans, operating and maintenance procedures, and safe work practices, especially permits for special circumstances the bypassing of safety systems. The management of change procedure, along with hazard analysis, risk assessment, and emergency response should include assessments of human factors. Incident investigation is also highlighted as a very important learning mechanism, and human factors issues should be examined during investigations.

While *Human Factors Methods for Improving Performance in the Process Industries* covers a broad field, it is very shallow, with many chapters that are less than two pages of material. Since it is more of a list of references, it is somewhat boring (BB). It is available from Amazon.com for ~\$90US.