Lessons Learned from the Application of Human Factors Engineering (HFE) In Process Safety Assessments

Benjamin R. Poblete, Minu Shikha Gandhi, Christopher W. Parker, Sam Ranasinghe, W.S. Atkins
920 Memorial City Way, Suite 700
Houston TX 77024
*Presenter email: benjamin.poblete@atkinsglobal.com

Abstract

Hazard analyses are a cornerstone of any process safety program. However, until recently hazard analyses had not formally included consideration of the human as a source of hazards. The US Bureau of Safety and Environmental Enforcement (BSEE) promulgated the rule on Safety Environment Management Systems (SEMS), API RP 75 in 2010, which now formally recognizes human factors during the design lifecycle and operations. In particular, for the element of hazard analysis, the SEMS regulation states “human factors should be considered in this analysis”. Additionally, Oil & Gas Producers (OGP) Report No. 454, Human Factors Engineering in Projects (2011) provides appropriate guidance within the HAZOP framework to address human factors in hazard analysis. Over the last 10-15 years, there have been industry papers that have discussed this topic at a high level, mostly about integration with Hazards and Operability Studies (HAZOPs). Despite this history and guidance, it is evident that the lessons learned during the application of HFE in design continue to evolve. In order to address this gap, this paper discusses practical illustrations and guidance gained from the authors’ experiences on major offshore design projects on a range of hazard analyses such as HAZOPs, Hazard Identification Studies (HAZIDs), Qualitative Risk Assessments (QRAs) and Escape, Evacuation and Rescue Analyses (EERAs), etc. The aim is to provide specific tools and lessons for application to most any system in the process industry. The challenge continues in integrating HFE during hazard and risk management activities in all engineering design activities, but applying knowledge gained to date will facilitate the evolution.