SCIC
SINGAPORE CHEMICAL INDUSTRY COUNCIL
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MHI Safety Knowledge Sharing

Safety Is Presence of Effective Safeguards Not Absence of Accidents!

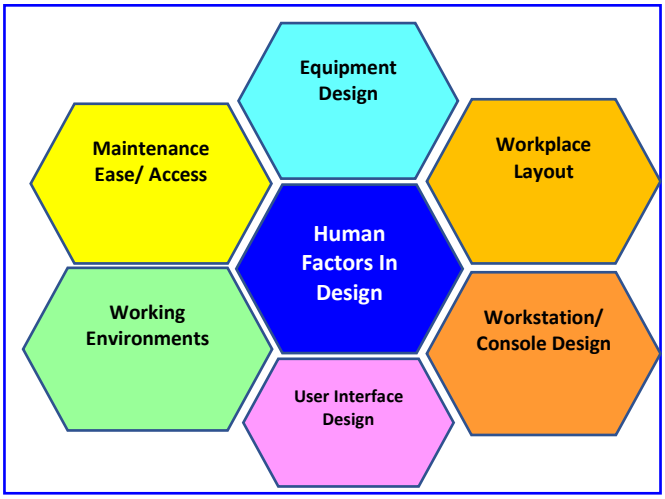
Human Factors In Design

Human Factors In Design in process/chemical industry is defined the integration of Human Factor related design principals into process plant design. It is also known as **Safety In Design (SID)** in some organisations.

For plants to operate safely and efficiently, they must be designed to support the employees who operate and maintain them. The overall objectives of implementing human factors is to ensure humans should not have to adapt to technology – technology should be built around the human capabilities and limitations.

Human Factors In Design is applied to the design of work systems, workplaces and products to achieve the following:

- Reduce risk to health, personal and process safety and the environment
- Eliminate, reduce the likelihood or mitigate the consequences of human error
- Improve human efficiency and productivity, thereby enhancing operational performance

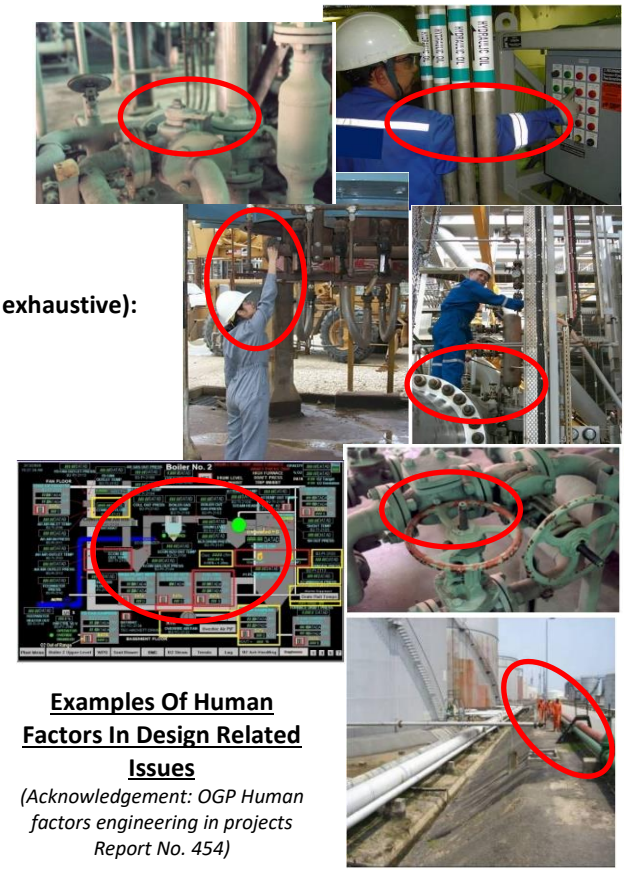


Elements Of Human Factors In Design

Human Factors In Design is best applied during early project stage to ensure its elements are properly embedded in the project scope, thus reducing CAPEX cost, eliminate later reworks, reduce long term opex cost, improve HSE at workplace.

Common issues reviewed under Human Factors In Design process (not exhaustive):

- Proper design of control room including ergonomic issues
- Clear DCS graphics without cluttering (no excessive information)
- DCS Alarm management (no alarm overload)
- Location of manually operated valves at proper height and orientation with adequate space for manual valves operation
- Sufficient space around equipment for installation, operation or maintenance, including crane access (where applicable)
- Ergonomically designed stairs, ladder, steps and walkway based on local user physiological features
- Plant walkways with no tripping/ obstruction/ low head space hazards
- Working environment (noise; temperature; lighting etc)
- Equipment layout to support logical sequence of operations
- Consistent, clear signage and label for normal and emergency works



Examples Of Human Factors In Design Related Issues

(Acknowledgement: OGP Human factors engineering in projects Report No. 454)

Expectation on Human Factors In Design in Singapore Safety Case guidance documents:

- **Design Key Issue 9** on **Human Factors** under Section 5.3.2.2 (clauses 191 ~ 197) of **Safety Case Technical Guide**
- **Section 8.3.1 of Appendix G of Safety Case Assessment Guide** provide details on expectation of implementation in MHI

Reference

- OGP Human factors engineering in projects Report No. 454
- API Human Factors 2005

An initiative of the SCIC Major Hazard Installation (MHI) Committee

With the implementation of Safety Case regime progresses into its operational phase, this bulletin aims to promote effective sharing of information to support MHIs in a successful implementation that could deliver the expected safety performance improvement of our industry. For enquiries, please contact SCIC via secretariat@scic.sg