

Title: Strategies for assessing and reducing inherent occupational health hazard and risk based on process information

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Abstract: Over the last few decades, the concept of inherent occupational health has gained increasing attention to reduce occupational hazards that may adversely impact workers' health. In order to assess occupational hazards in the chemical process, different inherent occupational health assessment methods have been developed at the early stages of process development and design. The methods in the order of process information availability - ranging from the detailed piping and instrumentation diagrams to a simple sketch of process concepts are the: occupational health index (OHI), health quotient index (HQI) and inherent occupational health index (IOHI). This paper proposes systematic heuristic frameworks to assist process designers and engineers in assessing and reducing inherent occupational health hazards or risks based on process information availability. Strategies for reducing health hazards or risks in the OHI, HQI and IOHI methods based on inherently safer design (ISD) keywords of minimization, substitution, moderation and simplification are included in this study. It is worth mentioning that the proposed frameworks act as guidelines for design engineers in systematically selecting the appropriate index and methodology to assess and reduce health hazards/risks based on the availability of the process information. A case study is solved to illustrate the proposed framework.