Applying Process Systems Engineering for Continuous Improvement in Pharmaceutical Production

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Abstract

In the field of process systems engineering (PSE), pharmaceutical industry is recognized as one of the future research targets [Reklaitis, 2007], and more intensive work is being desired. With the aim of contributing to this research movement, this paper showcases industrial application of PSE and related methods for improving pharmaceutical production processes. The target here is a Roche new manufacturing facility of Parenterals (i.e., injectable drug products) in Kaiseraugst called PKau, which started commercial operations in 2012. Already during the facility start-up, we have been applying PSE methods in improving PKau production processes considering quality, finance as well as environment in a continuous manner. Three case studies are presented in this paper: (1) reduction of product losses by applying simple mass flow analysis (2) mitigating product quality using risk assessment tools, and (3) improving energy consumption of the facility using Sanky diagram and multiobjective optimization techniques.

Keywords: Pharmaceutical production, Parenterals, energy efficiency, risk analysis, industrial case study

References