

HEAT EXCHANGER DESIGN HANDBOOK WEBINAR SERIES

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OPERATIONAL ISSUES CAUSED BY INCORRECT HEAT EXCHANGER DESIGN CHOICES

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Abstract

Failure of heat exchangers installed in industrial facilities may lead to serious accidents resulting in injuries, environmental spills, and significant financial losses. This presentation discusses various design choices that may work properly for most typical operations but fail when heat exchangers operate at unexpected operating conditions which were not considered at the design stage. The presentation shows five different design choices that could lead to serious operational problems are described in detail:

- Selecting design temperatures for the heat exchangers installed in networks that are subject to non-uniform fouling.
- Selecting design temperatures for electric process heaters.
- Selecting fixed tubesheet heat exchangers without considering all possible operating cases.
- Selecting conventional heat exchanger geometry for cycling services and high tube-side temperature increase.
- Selecting the tube bundle geometry resulting in unforeseen flow-induced vibration tube failures.



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Les Jackowski works for Chevron Technical Center (CTC) in Richmond California (San Francisco Bay Area) as a Consulting Heat Exchanger Engineer. After joining Chevron in 2005, Les has been involved in research on fouling mitigation and enhanced heat transfer surface technologies. He has developed unique pillow box design for heat exchangers, integrated reboiler-condensate pot design, and designs for crude unit preheat train exchangers. Les also develops training materials for teaching and mentoring other engineers. His previous experience came from EPC companies such as Technip and Parsons. After graduating with PhD from Warsaw University of Technology with specialization in Heat Transfer, Les worked as a post doc for Swiss Federal Institute of Technology (ETH) and for University of California Los Angeles (UCLA). Les is a Registered Professional Mechanical Engineer in California.