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Thermodynamic Simulation of Reciprocating Compressors to enable Diagnostics based on Measured Temperatures and Pressures

by:

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Abstract:

Monitoring and diagnostic systems enable reduction of maintenance costs as well as improvement of efficiency of reciprocating compressors. To detect damage and wear at an early stage is one of the main tasks. Valves and gaskets are the most common reasons for unscheduled shutdowns. These defects have a significant influence on the thermodynamic process. Therefore it is possible to detect these failures by measured temperatures and pressures by means of a thermodynamic simulation of reciprocating compressors.

Opposite challenges to the simulation model are sufficient accuracy and real-time computation. Variable simulation architecture to enable applicability to various reciprocating compressors is demanded, too. This paper presents a simulation system which was designed for the purpose of online diagnostics.