Abstract

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Title
36-1: "Diagnostics & Monitoring"
Avoidance of major secondary damages by early failure detection on a partially fractured piston rod

Summary
YARA Brunsbüttel operates two Thomassen reciprocating compressors in their carbon dioxide service. Both compressors are equipped with an online Asset Performance Management systems since 2001. An automatic shutdown system is enabled using machine protection parameters such as vibration, displacement and pressures to avoid secondary damages if a failure occurs. Over the last years, some machinery failures have been detected by those systems.

This fast and automatic shutdown function recently avoided a major and cost intensive damage on one compressor: the permanent piston rod position monitoring detected a cracked, i.e. virtually broken, piston rod. Before the rod ultimately broke, the machine was stopped automatically and thus, costly consequential damages were avoided.

The case study describes this event and the specifc analyses that are mandatory to diagnose, detect and pinpoint damages of the motion work of reciprocating compressors in early stages and prevent consequential damage.