



Abstract

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Title

36-2: Compressor Valves – How much do they contribute to operational Noise?

Summary

During commissioning of three identical piston compressor trains for oil field gas lift service some vibration issues needed attention. In the run of the investigations the suction pulsation vessels above all first stage cylinders became a particular focus point. High frequency vibrations drove the vessel and small bore nozzle vibration level up to unfavourable magnitude. The surprising factor was the also comparably high noise level in the vicinity of the first stage cylinders - and it was impossible to locate the source. The vibration issues were overcome – the noise remained.

Years later when all units had operated quite a number of hours a routine vibration check was performed. At two of the three units the high sound level had disappeared whereas one unit was still as loud as in the past. It turned out that first stage suction valves at the two silent machines had been replaced by a different design. The loud one, however, was still running with the original valve set.

Based on the findings it had to be concluded that valve design and sizing must have a significant impact on compressor unit vibration and its sound level.



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The paper outlines the path from the first observed phenomena through the conducted analyses to the results and the involved modifications.