PERFORMANCE ANALYSIS OF CENTRIFUGAL COMPRESSORS FOR AMMONIA
(Case Study in PT. Petrokimia Gresik)

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Abstract

Compressor is a device to deliver and increase the fluid energy (pressure) in this case is the energy of a compressible fluid. The main equipment in Petrochemical Plant to produce ammonia gas is Synthesis Gas Compressor which compresses gases such as; Argon(Ar), Hydrogen(H₂), Nitrogen(N₂) and Methane(CH₄). Based on data from PT. Petrokimia Gresik, the compressors operate at surge condition which its operate at a low flow but head system has a very high pressure, so that backflow occurs repeatedly at high frequencies and the compressors become unstable. Surge condition occurs when the compressor is operating close to or exceed the surge line characteristic curve of centrifugal compressors which are designed by their companies.

Synthesis Gas Compressor is an important equipment to produce ammonia gases, when the ammonia gases production is decrease than usual so that the raw material of fertilizer is reduce. Therefore, this Synthesis Gas Compressor needs to be analyzed and calculated so their performance can be known based on operating conditions. Performance of a centrifugal compressor depends on several key parameters, including: head, efficiency, capacity and power.

This analysis is expected to obtain the performance of a compressor by mathematical calculations and will be analyzed for the causes of the Synthesis Gas Compressor surge on its
consequences and effect on the performance of a synthesis gas compressor.

Keywords: Centrifugal compressors, Gas Synthesis, Surge, Ammonia, head, efficiency, capacity, power.