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Title:

Ammonia Plant Capacity Increase by Autothermal Reforming and Dual Pressure Synthesis

Abstract:

A capacity increase of an ammonia plant is an interesting way to increase its economic viability. Also, a revamp involves considerably less risk than the erection of a new plant since the overall investment is moderate and project implementation takes less time.

Capacity enlargements up to about 10 to 15 percent can usually be realized with moderate modifications by mobilizing the reserves which are already present in the majority of the process units. Only some equipment items are acting as bottlenecks and require bigger changes or replacement.

Larger capacity increases tend to require more substantial measures and bigger changes in the process. As this makes the capacity increase considerably more expensive, it is of key importance to select the most cost effective solution.

This paper investigates the technical and economical feasibility of a concept for a 30 percent capacity increase. It shows an interesting way how to overcome the limitations in the two most critical plant units: Reforming capacity is increased by a newly added autothermal reformer (ATR), while capacity is added to the ammonia synthesis by Uhde's patented Dual Pressure Process.

Using experience from reference projects, the paper compares this process concept with other technical options and discusses it on the basis of investment and operating cost. Another factor making this concept competitive is the fact that by installation of parallel equipment with few tie-ins only, the shutdown time for its implementation is very short.