

Case note

MEGADRIVE-LCI driven gas compressors provide profitable, efficient and safe gas supplies

Four MEGADRIVE-LCI variable speed drive systems, each rated at 15.5 MW, control the gas compressors at RAG's Haidach underground gas storage facility.

Controlling the compressors with electric variable speed drives provides an energy efficient method for injecting and withdrawing gas, based on fluctuating customer demands.



Haidach underground gas storage facility in Austria (source: RAG/Steve Haider)

RAG

RAG (Rohöl-Aufsuchungs Aktiengesellschaft) is the oldest independent oil and gas company in Austria. It is active in the exploration and production of oil and gas and is one of Europe's largest operators of underground gas storage.

Matching gas supply with demand

Austria imports some 86 percent of its natural gas. During winter, however, gas consumption exceeds delivery and so underground storage facilities are used to stockpile gas. The reserves are then used by regional gas supply companies to match fluctuations between supply and demand.

Supplying gas to the highest standards

RAG operates five underground gas storage facilities in Austria. The Haidach facility is one of the most technically advanced, providing profitable and efficient gas supplies to the highest safety standards. The facility is a joint venture project between Gazprom Export, Wingas and operator RAG. It is connected to the Austrian and German gas grids, and is one of the largest gas storage facilities of its kind in Europe.

Haidach key data

Reservoir extension: 3.5 x 5 km

Reservoir depth: 1,600 m

Working gas volume: approx. 2.6 bn m³

Maximum withdrawal capacity: 1,100,000 m³/h

Maximum injection capacity: 1,000,000 m³/h

Highlights

Efficient operation across a wide variety of head and flow conditions

Reduced maintenance costs and longer lifetime of equipment

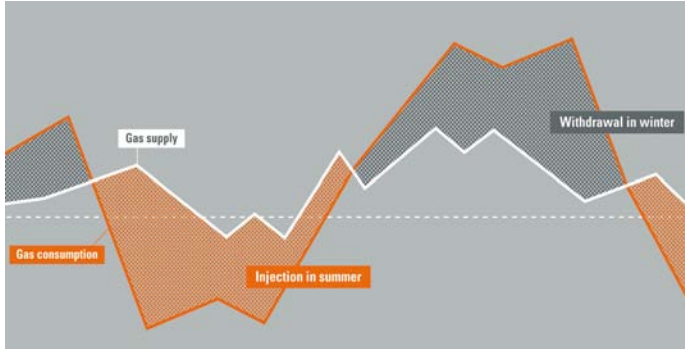


One of the four MEGADRIVE-LCI variable speed drives, rated at 15.5 MW, controlling the flow rate of the gas compressors at the Haidach underground gas storage facility

Challenge

Gas is injected and withdrawn via several wells. Compressors build up the pressure required to inject the natural gas into the underground storage. During withdrawal, the compressors are only required if the gas level and pressure in the storage reservoir is too low. The compressors are then used to adjust the gas pressure required for pipeline transport.

Depending on the season and gas prices, gas injection and withdrawal can vary greatly during a month or even day.



Graph showing the injection/withdrawal fluctuations over a period of 12 months (source: RAG)

With a fixed-speed compressor or a variable-speed compressor controlled by a gas turbine or hydraulic coupling, it is not possible to operate the plant in an energy efficient way over a wide injection and withdrawal operating mode.

Solution

ABB supplied four MEGADRIVE-LCI variable speed drive systems including oil-type transformers, water-cooled frequency converters and 4-pole synchronous motors. The variable speed drive systems are rated at 15.5 MW each. ABB also supplied filters for harmonic and power factor compensation and DriveMonitor™, ABB's intelligent monitoring and diagnostics system.

Benefits

Depending on the fluctuating injection and withdrawal requirements, the MEGADRIVE-LCI variable speed drive systems ensure that the gas compressors operate at the required gas flow and pressure conditions.



15.5 MW 4-pole ABB motor powering one of the compressors (source: RAG/Steve Haider)



Harmonic filter and power factor compensation equipment (source: RAG/Steve Haider)

Efficient operation across a range of head and flow conditions

Controlling gas compressors with variable speed drives results in efficient operation across a wide variety of head and flow conditions. The drives deliver constant capacity at variable pressure; variable capacity at constant pressure; or a combination of variable capacity and variable pressure. Substantial energy savings can be achieved by running the compressors at their optimum operating points.

Reduced maintenance costs and longer lifetime of equipment

Variable speed drives eliminate starting current peaks, reducing the stress on the motors. This results in reduced maintenance cost and increased lifetime of equipment.

Remote monitoring

The drives are equipped with DriveMonitor™ a monitoring and diagnostics system which allows remote real-time access to the drive. Long-term monitoring functions deliver important information on equipment status, tasks needed and possible performance improvements. It will speed up fault finding and reduce downtime thus increasing the total production time.

Key data of MEGADRIVE-LCI product family

Inverter type	6/12-pulse Load Commutated Inverter (LCI)
Power range	Air cooling: 2 - 31 MW Water cooling: 7 - 72 MW (higher on request)
Output voltage	2.1 - 10 kV
Maximum output frequency	60 Hz (optional 120 Hz)
Converter efficiency	Typically > 99%
Type of motor	Synchronous motor

For more information please contact:

www.abb.com/drives
www.rag-austria.at