

Application Notes

Gas turbine replacement with high speed motor systems for pipelines

With recent advancements in producing unconventional and shale gas formations, and with some markets willing to pay a premium for natural gas, it has become even more important for gas producers to move gas from low price markets to high price markets. To do this, gas transporters are revisiting their existing pipeline infrastructure and considering beneficial expansions and upgrades. By increasing compression size at compressor stations, more natural gas can be transported from location to location. While this could entail upgrading gas turbine drivers, using a high speed electric motor system is a more attractive option in many cases.

Pipeline owners looking to expand and upgrade their gas turbines are facing the following challenges:

Keeping operating and maintenance costs low

The expansion of a gas pipeline is a significant investment in the eyes of the pipeline company. If equipment is not running at high efficiency, this cuts into profits and delays the payback period of the upgrade. Furthermore, equipment that is not functioning due to frequent outages (planned or unplanned) results in even more financial losses.

Limited real estate

Expanding the throughput of a gas pipeline may not be as simple as upgrading to a larger compressor or larger gas turbine. The existing compressor station's housing creates size and space limitations, limiting options for additional compression and compression drivers.

Making things right with Integrated Drive Systems and Siemens High Speed Motors

Minimizing OPEX and service costs

Gas turbines are more difficult to start, compared to variable speed systems. They also have significantly lower efficiencies (around 40%), compared to the superior efficiency of a variable speed drive system (over 95%). This increases profitability and enables optimal process control. In addition, using a gas turbine as a compressor driver requires keeping multiple spare parts available, and scheduling more shutdowns for maintenance. Electric motor drive systems have greater availability, while providing the user with a wider speed control range.



Less maintenance and longer lifespans with active magnetic bearings

Switching to an electric motor and drive system allows for the use of active magnetic bearings on the motor. This eliminates the need for an external lubrication system for the motor, as well as a bearing vibration monitoring system. No oil means less maintenance, while being more environmentally friendly since the risk of potential spills is eliminated. Magnetic bearings also mean reduced vibration in the system and increased vibration control, extending the lifetime of your compression machine.

Operate within existing space

A high speed integrated variable speed drive system will fit within the current compression system's footprint. It may even leave additional space for other systems or future expansion, which alleviates the need to invest in larger stations.

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