

Can a Fluid Sensor Improve the Flow of Electricity?

During the summer months thousands of independently owned gas fired turbine generators search for a solution to supply electricity

Thousands of gas fired turbine generators of the 1 to 12,000 kW sizes provide supplemental power to businesses and industry around the world. Independently owned and operated, there is a keen eye focused on their efficiency and ROI. When operators see a loss of up to 12% power output during the summer months—when more power is typically required—it's not long before the hunt for a solution is on.

The problem is basic: Gas turbines produce less power on hot days. The answer is to cool the air before it enters the turbine, and this is done most commonly through water evaporation. The two primary methods used to provide evaporative liquid are either a water-soaked medium over which air passes or high-pressure water misters that spray atomized water droplets into the air intake. Water misting systems can provide more control over air cooling process than simpler water-soaked static media.

Our customer in this case—we'll call them TurboGen Corp.—is a manufacturer of turbine generators and the developer of a water-misting type evaporator system. Their high-pressure misting systems enable gas turbine generators to provide peak output throughout the year. High water pressure is required in the system to assure that the water droplet size is small enough to assure vaporization before entering the turbine. It was the high-pressure sensing requirements that caused TurboGen Corp. to contact Gems Sensors for a solution.

With pressures of over 2300PSI in a system subject to water hammer, TurboGen needed a sensor that could take a continuous beating. Our Psibar® 1200 Series CVD pressure transducers had all the needed traits. What made the 1200 Series sensor ideal is a thicker-than-normal stainless steel diaphragm that provides superior strength against deformation or failure. In fact, the 1200 Series features a proof pressure that is 4 times over the maximum measured pressure and were more than capable to absorb the pressure spikes caused by water hammer and pump ripple.





So how does the Psibar® 1200 Series provide typical full-scale accuracy of 0.5% with such a sturdy diaphragm? The key is Chemical Vapor Deposition (CVD) sensor technology. This process deposits high-quality silicon at low temperature in a thin film that is atomically fused directly to the steel surface of the gauge beam and therefore follows the shape of the beam very accurately. This atomic fusion is the foundation for excellent performance and stability. Stability was important to our customer, as it should be in any industrial application where predictable performance is important, and the Series 1200 delivers exceptionally with long-term drift of only 0.2% full scale per year. The sensitivity and stability provided by the CVD sensor allows the use of the heavy-duty diaphragm—a rugged, yet responsive combination.

TurboGen Corp. tested the GemS Psibar® pressure sensor for a year and decided that it functioned flawlessly and would continue to be used in final production systems.

Other configuration elements of the Psibar® 1200 Series used in this application include:

- 1/4"-18 NPT pressure port
- 3 meter NEMA 4 cable electrical connection
- CE Approval and UL Listing

Other features of Psibar® Pressure Sensors:

- Laser-welded strain gauge.
- Stainless steel wetted-parts and cases
- Custom ASIC for exceptional thermal compensation
- RFI/EMI & ESD protection circuitry

At GemS Sensors & Controls, you can find thousands of sensors in our catalog—a great deal are on the shelf and ready for shipping. A growing number of OEM design engineers know that in addition to these standard products, GemS also specializes in custom engineered solutions. Think of GemS the next time that your application needs fluid sensing—we're up to the challenge!

For more information about how GemS Sensors & Controls finds solutions for pressure applications, please contact us by phone 1.800.378.1600, email info@gemssensors.com or visit our website www.GemSensors.com.