Case Study

Bornemann

An ITT Brand

# Multiphase Pumping Simplifies Infrastructure and Slashes Operating Costs

A mid-size Canadian energy producer is headquartered near the Bakken Formation. At one of their fields, a conventional reservoir, the well production is 80-90% gas,10% oil and the remainder is water. Like many producers with multiphase production, the company had been relying on a satellite treatment scenario in which multiple separation facilities were built across the field, with each accommodating six or seven wells. Following separation, the water was re-injected at the site and the oil and gas were pumped away in separate pipelines.

Several years ago, the producer's engineers became interested in the economic and environmental advantages that Bornemann multiphase pumping (MPP) can deliver. It enables all production to be pumped away without on-site separation. Since the producer was about to add new drill pads, they decided that this was an ideal opportunity to evaluate the technology. The positive results they experienced have led to a firm commitment to continue with the technology and to employ it at additional sites going forward.

## Greatly simplified infrastructure

In the satellite treatment scenario, the producer installed a separator, vessels, tanks, compressor and rod pump at multiple locations across the field. Permits were required to put the tanks down and berms had to be built. A flare was added in case the treatment facility ever went into upset. And, of course, regulations needed to be met in the event of a spill—all part of the environmental challenges of putting separation tanks and vessels on any piece of property.

Bornemann MPP technology, on the other hand, "frees the producer to perform the separation on land that is best suited for that purpose," said Gordon Heather, GM of Bornemann North America. "A single superbattery separator can be located 4-10 miles away from the drill pads to treat multiphase production that would normally require multiple satellite installations."

That's because, unlike conventional pumps, Bornemann pumps feature a twin screw configuration that provides dry running capabilities and allows for the presence of gases. "Our technology is comparable to a huge vacuum cleaner, said Gerhard Rohlfing, VP of Technology & Engineering at ITT Bornemann GmbH. "We take everything that's coming out of the ground—gas, oil, water and sediment—and suck it in our vacuum cleaner and pump it to the processing station."

The only infrastructure required near the wellheads is a small building housing a Bornemann multiphase pump. There are no tanks, separators, flares or liquids that could potentially spill. And coming on stream simply requires connecting the well, pump, pipeline and power.

## Eliminates redundant infrastructure

The producer has realized significant economies of scale by erecting a single super-battery for treatment as opposed to having multiple ones. They are also saving on the disposal of produced water because it can be done at the super-battery site instead of at the satellite locations.

“This simplified footprint offers another advantage as well,” continued Gordon. “The last one the producer placed was really close to a farmer’s house and obviously it’s far easier to get buy-in from the property owner if all your infrastructure is contained in one tidy, quiet building.”

## 99% uptime sharply lower’s operating costs

Of all the benefits that Bornemann MPP technology provides, lower operating costs is the most profound. “With a conventional system you will never achieve more than 95% uptime, said Gerhard. “But with MPP you have one simple machine running. So you can easily achieve 99% uptime. And that 4% represents big dollars for producers.”

Reliability is so high, in fact, the producer has no need to install back-up pumps. Their monitoring teams visit each site only occasionally, so manpower costs are reduced. They stock fewer spare parts. And if a problem ever develops, they can confidently make repairs within two shifts.

## The ITT Impact

The energy producer not only lowered capital expenditure and maintenance costs but increased production and extended well life.

## Lower back pressure yields higher production

There is one other major advantage to MPP. With the simplified infrastructure, back pressure is lowered on the reservoir, so the producer is netting a greater inflow of fluids into the well bore and has increased their production. What’s more, reduced back pressure means they can also expect a longer production cycle from the field before it gets shut in.

## Tailored to each application

Bornemann multiphase pumps are customer-configured to the exact conditions of each application. They are designed to cover the performance envelope even if there are major deviations from the initial specifications, which is often the case.

In addition, special degressive screw geometries can be specified which feature a progressively reduced pitch that provide efficiency increases of up to 25%. For the producer, this was critical because available line power was very limited, so a hyper-degressive screw made the installations possible.

Once configured, each skid-mounted pump is equipped with all required instrumentation, piping and valves, so it’s ready to be placed into immediate service.

## Looking ahead

The producer has installed 6 Bornemann multiphase pumps over the last 18 months The pumps have become their new standard for field operations and will continue to be specified for new pads, with one to two projected to come into production every year.

To date, Bornemann, the world leader in multiphase pumping technology for the oil and gas industry, has supplied approximately 600 installs around the world. Many more are expected as word-of-mouth has spread through the industry about the proven benefits of the technology.