NOVOMET

CASE STUDY

ESP Slotted Gravity Screens Enable 2 Years Uninterrupted Production in High-Sand Wells, Save $160,000 USD

CHALLENGE

The operator needed to replace a PCP and an ESP on wells in the same field, both having failed due to downhole sand

SOLUTION

Deploy high-efficiency ESP systems protected by slotted gravity screens

RESULTS

- Maintained required production rates in both wells
- Delivered uninterrupted production for 995+ days in one well and 875+ days in another (both still climbing)
- Saved $160,000 USD by eliminating at least two workovers in the same period

Downhole Sand Causing PCP and ESP Failures

An operator in the Middle East had a high-sand well they were producing with a progressive cavity pump (PCP) system. After a pause in production, they could not get the PCP to start again. Upon pulling the unit, they found the rotor packed with sand. They determined it was high concentrations of sand and solids in the well that caused the PCP to fail.

After hearing about high efficiency electrical submersible pumping (ESP) systems and ESP slotted gravity screens from Novomet, the operator decided to try this solution instead of running another PCP in the well. The ESP outfitted with a slotted gravity screen delivered exceptional performance as detailed later in this case study.

Not long after installing Novomet equipment in the first well, the operator installed a competitor's ESP in a nearby offset well. The competitor's ESP failed in just 7 days as a direct result of the high-sand downhole environment.

The operator quickly decided to replace the competitor's failed ESP with the same high-efficiency system and slotted gravity screen from Novomet. The results in both wells have been spectacular.

ESP slotted gravity screens combine screen and solids separator technologies for superior sand control in wells with high concentrations of solids.

Middle East

Getting Results in High-Sand Fluids

In the well previously produced using a PCP, Novomet installed a 4.49-in. (114-mm) slotted gravity screen with a 5.35-in. (136-mm) ESP system. The ESP was set at 4,300 ft (1311 m) and commissioned. Since that day, the well has operated without problems and has produced an average of 3,300 BPD (525 m^3/d) for 995 days and counting as of the date of publication.

In the well where the competitor ESP failed after just 7 days of operation, Novomet installed the same 4.49-in. slotted gravity screen with a 5.35-in. ESP system. The ESP was set at 4,232 ft (1290 m) and commissioned. Since that day, the well has operated without problems and has produced an average of 1,900 BPD (302 m^3/d) for 877 days and counting.

Given the previous PCP and competitor ESP failures in the wells, conservative estimates are that the operator would have had to perform at least one workover on each well (if not more) during the same period. At typical workover rates in the field, the operator saved $160,000 USD by eliminating at least two workovers in the 2-year period.

About the Technology

The ESP slotted gravity screen combines the sand blocking capabilities of a slotted screen with the solids separation process used in hydrocyclone sand separators. The result is a sand control solution that prevents particles 100 microns and larger in size from entering and damaging an ESP system.

The gravity filter stabilizes ESP operation in wells with high levels of sand and proppant. It is mounted between the pump and protector and serves as an intake for the ESP.

Sand control is provided primarily with the slotted screen. Competing slotted screen designs use a safety valve that opens when the filter becomes plugged with sediment or scale. This enables the ESP to continue operating, but allows sand to pass freely through the system where it damages internal components and will eventually cause failure. Instead of a safety valve, our slotted gravity screen uses the sand separator. Separating the sand instead of just letting it pass through the system prevents particles from damaging the ESP and extends runlife.