

Resin Treatment Preserves Well Integrity and Avoids up to USD 1.5 Million in Workover Costs

A specially formulated solution stopped sustained casing pressure and solved well integrity issues

Within days of receiving the call, Schlumberger helped the operator achieve a well test of more than 80 MMcf/d and return to full production, eliminating up to USD 1.5 million in potential workover costs.

Sustained casing pressure threatened well loss

Sustained casing pressure (SCP) is a common threat to well integrity. It occurs when pressure builds up behind the casing and continues to increase, even after it is bled off, leading to potential well control issues. Sustained pressure in the well annulus can be expensive to remediate through conventional means, such as cement squeeze, which is often not suitable because it will not seal microchannels that can form over time in the solid cement. Workover rigs are a costly alternative, while a lube-and-bleed option only solves the issue temporarily.

One operator facing such issues used Production ExPRESS* rapid production response solutions to restore and return the well to production within days.

Fast remediation with a customized resin

Production ExPRESS solutions are a suite of services focused on the wellhead and surface facilities to help operators maximize production and improve cash flow through rapid diagnosis and surface intervention. In a fast-changing industry, Production ExPRESS solutions help to proactively eliminate wasteful or hazardous operations, especially in mature or underperforming fields, with a service that is practical, modular, and highly responsive.

The operator collaborated with the Production ExPRESS solutions team to find a suitable remedy for the SCP—injecting special resin into the annulus to seal microchannels that had developed in the cement. The designed solution required crucial studies on the compatibility of the resin with the characteristics of the well, including the well depth and fluid parameters to calculate the sinking time of the chemical, additives needed for density adjustments, and volume of fluids required. This effectively predicted the hardening time of the resin, which solidifies in response to wellbore temperature.

The high-quality resin formulation was integrated into a mobile package consisting of a customized set of surface equipment and mixing tanks. The resin was pumped into the annulus using chemical injection pumps and pressurized to penetrate inside all of the cement microchannels. Water was injected into the well to squeeze the chemical before it hardened, a complex operation that required careful real-time monitoring and meticulous execution. The low-viscosity polymer resin chosen for the job was strong, bonded well, and sealed off undesired flow into and out of the failed section.

A permanent fix with no need for further maintenance

The fit-for-purpose solution offered a permanent fix, avoiding well abandonment and production loss and eliminating the need for any further annual maintenance services. Because the operator was under contractual obligation to produce the well, without the solution another well would have been needed to compensate for the lost production. It also eliminated associated



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safety and environmental risks while providing an effective alternative that avoided lengthy workover costs.

Once the issue was solved, the well was perforated, tested, and showed more than 80-MMcf/d gas flow rate. The operator was very satisfied with the solution, which helped avoid as much as USD 1.5 million in workover costs, and plans to apply it to multiple other wells facing similar problems in the area.



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