SC-XP System Provided Gravel Pack in Less Time
Baker Hughes minimized operational time and risk for gravel packs with first installation of SC-XP tools

Benefits
- Minimized operation time
- Increased the operational window
- Simplified operation with single treatment position technology
- Minimized operation risk with fit-for-purpose gravel-pack tools
- Allowed easy retrieval of tools

Well background and challenges
- Baker Hughes Bossier City Test Rig
- October 2010
- Casing: 9½ in. 47 lb/ft; 8.525-in. drift
- Packer Setting Depth: 405 ft (23.4 m)
- Realistically reproduce all the gravel pack steps done to a production well

Baker Hughes solution and results
- Reliable sand control packer
  - Successfully set and retrieved the SC-XP packer
- Quicker deployment
  - No run-in speed limitation due to the ZXP packer element
- Simplified operation
  - Successfully used SC-XP crossover and service tools to locate position with set-down weight
- Fit-for-purpose gravel-pack tools
  - Successfully pumped gravel slurry, gravel packed the well, and reversed out excess proppant
- Fully retrievable system
  - Retrieved SC-XP system from well

The first well installation of the SC-XP™ system occurred at the Baker Hughes test rig in Bossier City. The formation leak-off was simulated using a wire-wrapped screen directly attached to the working casing, where the packer was set. This casing/screen was run inside a larger ID casing, creating a between-casings annulus flow path with ability to choke the flow.

Since the SC-XP packer incorporates ZXP™ element technology, there was no concern with maximum run-in speed, minimizing the operation time. Once the packer was at depth, it was set and pressure tested successfully, the service tools were successfully released, and the working positions were marked on drill pipe.

With only two working positions, the reverse and treatment positions were both defined with set-down weight and hydraulically confirmed. Because the tool movement boundaries are mechanically enforced by the SC-XP crossover tool itself and SC-XP metering locator, the job went faster and more simply than with other systems. The movement boundaries and the tool’s high-load set-down weight capability in each position increased the operational window. The single treatment position technology allowed both the packer seal to be hydraulically tested with annular pressure and the gravel-pack job to be pumped with live annulus monitoring, without moving the crossover tool to another position. This delivered not just a much more simplified operation, but also contributed to reduce the time and the intrinsic risk of the operation.

A 70-pptg Xanvis slurry was used to transport the 12-ppa, 20-40 proppant through the tools and into the screen/casing annulus. When the gravel-pack
screens were completely covered with proppant, a positive screen-out was observed on the surface; the system was moved to reverse, and the excess proppant was reversed out.

The service tools were pulled out of hole for inspection and analysis. The SC-XP packer, SC-XP extension, and gravel-pack screens were then successfully retrieved, proving the full functionality of the SC-XP system.

<table>
<thead>
<tr>
<th>Ratings</th>
<th>Extreme Frac</th>
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<tbody>
<tr>
<td>Maximum Treating Pressure</td>
<td>15,000 psi (1034 bar)</td>
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<tr>
<td>Production Δp Rating</td>
<td>12,000 psi (827.4 bar)</td>
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<tr>
<td>Tensile Rating on Run-In</td>
<td>400,000 lb (181437 kg)</td>
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<tr>
<td>Maximum Temperature Rating</td>
<td>400°F (204.4°C)</td>
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<tr>
<td>Maximum Tested Proppant Volume/Rate</td>
<td>1.5M lb / 60 bpm (680389 kg/60 bpm/0.159 m³/s)</td>
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<td>ISO 14310 Grade</td>
<td>V0</td>
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