

GEM-Valve retrievable wireless subsurface safety valve system

Enables well restoration and production recovery after a safety valve failure

Applications

- Onshore and offshore producing and injection wells
- Wells requiring remediation after tubing-retrievable subsurface safety valve (TR-SSSV) failure
- Wells originally completed without a surface-controlled subsurface safety valve and now requiring one due to policy or regulation changes

Remediate valves with wireless surface control

GEM-Valve* retrievable wireless subsurface safety valve system is a remediation solution that enables operators to resume well production shortly after a subsurface safety valve failure. The system enables remediation without relinquishing control of subsurface safety shut-in equipment via wireless surface control of the valve, allowing safe and regulatory compliant production of oil and gas wells.

The GEM-Valve safety valve system significantly reduces production deferral losses and remediation cost associated with subsurface safety valve failures by minimizing well shut-in periods during the troubleshooting, repair, or remediation stages. Installed as a temporary safety valve solution, the system eliminates production deferral while workover intervention planning and sourcing activities take place. Installed as a permanent solution, it completely eliminates significant workover repair and recompletion costs, which might not be justifiable for old producing wells in mature fields. The system's wireless control is an ideal solution for new subsurface safety valve installations in wells that didn't have a safety valve as part of their original completion but now require one due to policy or regulation changes.

How it works

The GEM-Valve safety valve system can be deployed on slickline and installed anywhere in the upper completion on a landing nipple or nippleless configuration when run with a retrievable packer. The system is battery operated and wirelessly controlled via an electromagnetic signal, meaning it doesn't require physical connection with a surface panel for control (e.g., hydraulic control lines).

Controlled to stay open from surface, the GEM-Valve safety valve system is largely tolerant to downhole flow and pressure variations, which are responsible for frequent undesired valve closures of alternative remediation solutions such as subsurface-controlled



Self-equalizing flapper enables opening with surface command.

safety valves (e.g., ambient valves). For this reason, wells fitted with the GEM-Valve safety valve system can flow in optimal conditions, maximizing production. A flapper valve with built-in equalization removes the need for borehole pressurization or mechanical intervention to open the valve and resume production. Reestablishing flow after scheduled periodic tests or legitimate emergency well shut-in events is as simple a task as sending a command from surface.

Advantages

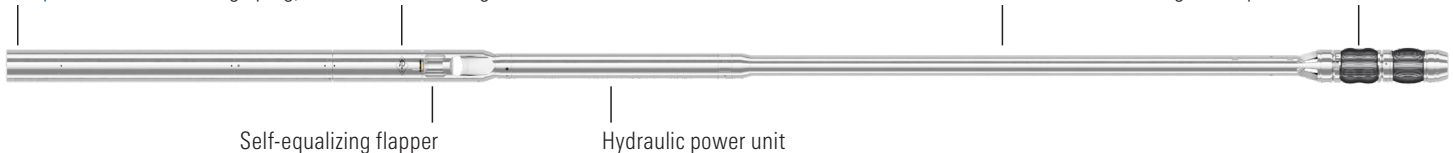
- Wireless command of the safety valve; neither hydraulic control line nor cable
- API Spec 14A certified and monogrammed
- Deployment anywhere in upper completion using lock mandrel or retrievable packer with simple slickline intervention
- Surface control hardware that can control up to 10 valves
- Programmable logic of surface control panel for easy integration with existing emergency shutdown, remote monitoring, and valve actuation infrastructure at the platform or facility
- Normally closed fail-safe system with built-in self-equalizing flapper that enables opening with just a surface command (equalize without mechanical intervention or well pressurization)

Crossover to lock mandrel or nippleless packer (e.g., Peak Well Systems' SIMplus* retrievable bridge plug)

API Spec 14A-certified and monogrammed valve

Control and communication electronics, including battery

Centralizer and antenna



GEM-Valve retrievable wireless subsurface safety valve system.

GEM-Valve

| Specifications for GEM-Valve Safety Valve System | | |
|---|--|-----------------|
| Tubing Size, in | 3½ | 4½ |
| OD, in [mm] | 2.716 [69] | 3.720 [94.5] |
| ID (flow tube), in [mm] | 1.299 [33] | 2.008 [51] |
| Differential pressure rating, psi [kPa] | 6,000 [41,368] | 10,000 [68,948] |
| Min. flow area (flow tube), in ² [mm ²] | 1.325 [855] | 3.165 [2,042] |
| Max. flow rate | | |
| Gas, MMcf/d | 17.3 | 30.8 |
| Liquid, bbl/d | 3,360 | 5,760 |
| Closing time, s | <50 | <50 |
| Material | NACE-compliant corrosion resistant alloy (CRA) | |
| Overall System | | |
| Length with standard battery (without crossover and packer), in [mm] | 120 [3,038] | 131 [3,333] |
| Weight with standard battery (without crossover and packer), lbm [kg] | 79.4 [36] | 112.4 [51] |
| Service type | Sour environment (H ₂ S, CO ₂ , or both) | |
| Power and Control System | | |
| Max. diameter (centralizer), in [mm] | 2.795 [71] | 3.740 [95] |
| Temperature rating, degF [degC] | 257 [125] | 257 [125] |
| Environmental test qualification | Transverse shock and vibration | |
| Battery life | Min. 9 months (extendible option available) | |

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