

Seaboard™ Unitized Lock-Ring Improves Safety and Saves Cost

Speed head designed to reduce non productive time while improving safety

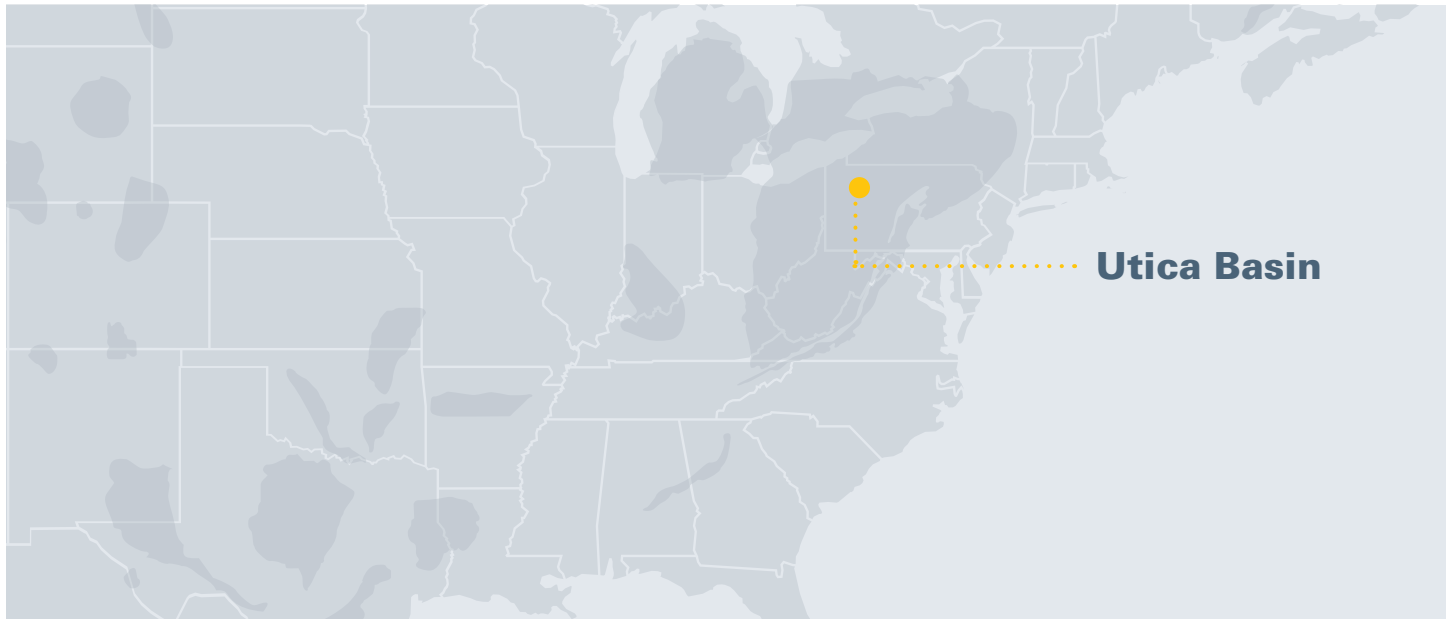
SPM™ Oil & Gas

A Caterpillar Company

Case Study

Utica Basin

A premier operator that operates 1,000's of wellheads in the Utica Basin and has named SPM Oil & Gas (SPM) as its sole wellhead provider.

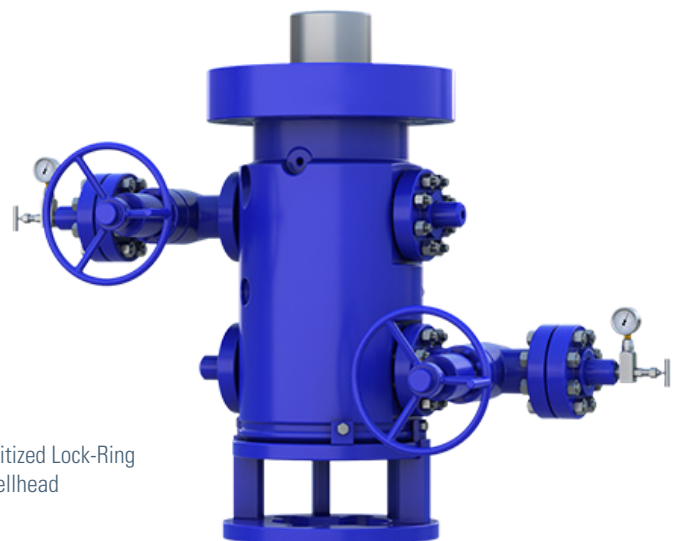


Reduce Hazards

Internal Lock Ring for a safer site

\$500,000 Saved

in potential equipment damage



Unitized Lock-Ring Wellhead

BENEFITS:

- Improves safety at the wellsite
- Casing head with internal lock down hangers with positive engagement, eliminating leak path risk due to lock screws penetration
- Offers greater HSE benefit compared to externally biased lock-rings
- Protects equipment beyond the wellhead from catastrophic events
- The Seaboard™ Unitized Lock-Ring technology is available with Gen 1, Gen 2 and S-29 Wellheads

UNITIZED LOCK RING CASE STUDY

THE CHALLENGE

Ascent Resources operates 1,000 wellheads in the Utica basin and runs several Seaboard™ Unitized Lock-Ring wellheads with three strings of casing; 13 3/8", 9 5/8" and 5 1/2".

Recently, after the operator had finished the drilling process and ran all of its casing, it rigged up to begin the fracking process. As they began to pressure up to test its equipment, unbeknownst to its crew, the 5 1/2" casing downhole had parted. The pressure burst the 9 5/8" casing and filled the 13 3/8" casing, generating 8,500 psi that pushed against the 9 5/8" casing that was secured by SPM's internally biased Unitized Lock-Ring technology. The extreme pressure caused the weld on the bottom of the casing head to fail and the wellhead to jump several feet in the air, removing it from the well.

Upon inspection, it was determined SPM's equipment sustained 600,000 psi of force. However, SPM's equipment was intact and able to be pressured up on its 9 5/8" pack off to test the pressure of its seals; a testament to the enhanced safety of its internally biased Unitized Lock-Ring technology.

THE APPROACH

While the current industry norm is to utilize externally biased lock rings, SPM purposefully engineered its Unitized Lock-Ring to be internally biased. Internally biased lock rings stay in place for the duration of the well, which provides the greater protection for personnel in the event of a catastrophic event like the one this operating company experienced.

THE RESULT

The most important outcome for the operator was the safety of its workers; no one was harmed. This was a direct result of SPM's internally biased lock-ring technology's ability to reduce leak paths.

The Unitized Lock-Ring technology not only protected its workers but it also prevented other equipment on the site's surface from being damaged, saving the company \$500,000 minimum in potential repair and replacement costs.

SPM's internally biased Unitized Lock-Ring essentially acted as a 'bulletproof vest' for personnel on-site that day. Due to the protection this technology provided to the crew, SPM's engineering expertise and responsive partnership over nearly three years, the large operating company has named SPM its sole wellhead provider. As the company upgrades its wellheads to the next generation, using the Seaboard™ Unitized Lock-Ring technology will be a constant.

THE INNOVATION

Improving the safety of the frac site is SPM's primary concern and its reason for being an innovator in internally biased lock-ring technology. While externally biased lock-rings can fail to snap securely in place, which puts crews at risk, SPM's internally biased lock-ring technology is superior due to its drive ring which locks the lock-ring in place. This allows for a positive lock indication, due to the number of rotations needed, and prevents the lock-ring from collapsing during extreme wellbore pressures. SPM's internally biased lock-ring and drive ring are rated for 1.4 million pounds of force. Additionally, elastomer retention seals in the wear bushing replace numerous lock screws, which eliminates labor as well as potential leak paths. This limits workers exposure to a dangerous environment while mitigating the need for multiple assemblies and wellhead penetrations.

The Seaboard™ Unitized Lock-Ring technology further enhances safety with a casing head featuring internal lock down hangers with positive engagement to further reduce leak risks.

With the Seaboard™ Unitized Lock-Ring technology, operators can dramatically improve site safety.



**"..sustained 600,000
lbf of force...
SPM's equipment
was intact.."**



Rated for
1.4 Million
pounds of force

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