

FyreRok Gas Storage Forum - 2024

A "Forum" is a place where ideas are exchanged, and that is our exact purpose for this meeting.

We invite you to join us in Cranberry Township, PA (near Pittsburgh) for the fourth annual Gas Storage Forum. We will have a range of presentations and discussions on technical issues facing the current U.S. gas storage industry and attendees will be able to exchange ideas with many other operational and technical staff from gas storage companies around the U.S.



Where: RLA Learning & Conference Center, 850 Cranberry Woods Dr., Cranberry Township, PA

When: February 26-27, 2024

Registration: Register online at www.FyreRok.com/forum

Cost: Before February 1st - **\$425**

February 1st to 25th - **\$500**

February 26th to 27th - **\$600**

Contact Information: Tim Miller (814-404-8085) or Mark Miller (814-323-6907)



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Monday, February 26, 2024

6:00 PM to 8:00 PM Reception Social at the Conference Center

RLA Learning and Conference Center
850 Cranberry Woods Drive
Cranberry Township, PA 16066

Beverages and Hors-d'oeuvres will be served.

Tuesday, February 27, 2023

07:30 Morning Coffee and Light Breakfast

08:30 Opening Remarks (Mark Miller)

08:45 Presentation 1: "Annular Gas Migration - Source Identification Through Spectral Acoustic Analysis"

Maxim Volkov – TGT Diagnostics

09:45 Presentation 2: "Case Studies in Advanced Well Integrity Diagnostics for Underground Storage"

- *Charles Bourgeois- DarkVision*

10:45 Presentation 3: "Testing Horizontal Wells – Understanding the Unique Challenges and Attributes"

- *Tim Miller – FyreRok Reservoir Consulting*

11:45 Lunch Break (Provided by FyreRok)

1:15 Presentation 4: "A Systematic Approach to Identifying Annular Vent Pathways and Remediation Utilizing Biomineralization"

- *Bryce Yeager - BioSqueeze*

2:15 Presentation 5: "Drilling Gas Storage Cavern Wells"

- *Alex Gephart - WSP*

3:15 Roundtable Discussion / Open Q&A

- *Zach Evans – DarkVision*

4:45 Closing Remarks



Presentation Topics and Descriptions

Presentation 1: “Annular Gas Migration - Source Identification Through Spectral Acoustic Analysis”

Annular gas flow is the most common integrity issue found during regulatory audits and inspections, generating not only environmental concerns but also operational and safety-related concerns. Identifying the source of annular flow and sustained casing pressures with accuracy is critical to target remediation and ensure the issue is controlled at the source eliminating the potential of recurrence in the future. Source identification through spectral acoustic analysis not only allows locating the source, but differentiates between completion leaks, cement channeling, fracture and matrix flows in the formation.

Presentation 2: “Case Studies in Advanced Well Integrity Diagnostics for Underground Storage”

Well integrity is both an extremely critical aspect of storage well risk management and a highly scrutinized diagnostic in regulatory reporting. With both internal and external drivers causing storage operators to dedicate increased resources in evaluating casing in a potentially more rigorous fashion and at more frequent intervals than in previous years, new technologies and methodologies for tubular evaluation have proven valuable in optimizing risk ranking and capital prioritization while meeting regulatory requirements. This presentation will look at advanced diagnostics for storage well integrity, analyzing industry best practices and providing case studies specifically from storage applications that highlight the practical advantages of direct measurement, repeatability, non-assumptive burst pressure calculations, and more.

Presentation 3: “Testing Horizontal Wells – Understanding the Unique Challenges and Attributes”

Horizontal storage wells have become commonplace in our industry. While the same well test theory applies to both vertical and horizontal wells, there are some unique challenges to both testing and analyzing horizontal wells. Horizontal wells undergo multiple flow regimes before arriving at pseudo-radial flow. This presents some technical challenges but it also allows for a more detailed analysis. This presentation will discuss some things that should be considered when planning a horizontal well test, that can help to maximize the effectiveness of the data and the analysis.



Presentation 4: “A Systematic Approach to Identifying Annular Vent Pathways and Remediation Utilizing Biomineralization”

BioSqueeze utilizes biomineralization, a process where naturally occurring bacteria deposit crystalline calcium carbonate, to seal leak pathways in the cement sheath of an oil, gas, or storage well. In order to identify the optimal location for intervention and intersection of the pathway, multiple factors are considered in a systematic engineering and design process. The process is centered around a comprehensive analysis of downhole conditions including shallow geology, drilling parameters, and a unique cement evaluation method. A pilot project utilizing the improved design process has translated to increased success rates of sealing annular vent pathways.

Presentation 5: “Drilling Gas Storage Cavern Wells”

Solution-mined salt caverns are commonly used to store gas underground all over the world, and these caverns provide large volume storage with high deliverability rates – and you cannot have a high-performing well without drilling one first. There are many drilling challenges to overcome so that wellbore integrity is not jeopardized. This presentation will discuss the wellbore design and summarize typical drilling operations for gas storage cavern wells. Topics will include describing the differences between cavern wells and conventional E&P wells, discussing design considerations, identifying data gathering opportunities during drilling operations, as well as outline drilling operations and identifying the most common drilling challenges, risks, and concerns.

Roundtable Discussion / Open Q&A

The roundtable discussion provides the audience with the opportunity to discuss those topics most crucial to their storage operations with peers and presenters who may be facing similar issues. By collaborating with other storage operators, we can all become stronger, safer, and more profitable.

Potential topics for discussion include but certainly are not limited to the following:

- PHMSA regulations and audit preparation
- The future of gas storage and the impact of CO₂ and H₂
- Boosting deliverability and optimizing field performance
- Best practices for well control during workover operations
- Plug and abandonment regulations, permits and best practices

All topics are open for discussion, and should more time be required for this session, the discussion may extend beyond the scheduled conclusion based on audience interest.



About the Speakers



Maxim Volkov as a Principal Domain Champion in TGT Diagnostics takes the lead in overseeing the well processing and interpretation department. He is actively involved in conducting research and development activities focused on temperature, spectral acoustics, and electromagnetic techniques to evaluate the performance of well barriers, completion and reservoir.



Charles Bourgeois the US Sales Director for DarkVision Technologies. Graduating with a bachelor's degree in mechanical engineering from Louisiana State University, Charles began his career as a field engineer with Baker Hughes, where he worked across the Wireline business segment in various roles including both Product Manager and Account Manager. He has specific experience in both running and analyzing the full range of casing inspection logs, including calipers, flux leakage tools, and high-resolution ultrasonic. Since joining DarkVision, Charles has been instrumental in advancing the engineering deliverables from acoustic based imaging including entry hole analysis, volumetric proppant calculations, and burst pressure reporting. He has helped to publish numerous SPE papers on well integrity and completion optimization and is a regular speaker at high-profile industry events.



Tim Miller has over 17 years of completion and production experience, including well testing in gas storage fields and Marcellus and Utica shale gas wells. He is a graduate of Penn State University with a BS in Petroleum Engineering. He started his career with Chesapeake managing Marcellus Shale production and completions. Tim co-founded FyreRok in 2013 alongside Mark Miller and oversees well testing and engineering projects. Tim serves as a Vice President and Sr. Consultant at FyreRok Reservoir Consulting.



Bryce Yeager is Vice President East Region for BioSqueeze Inc based in Pittsburgh, PA. After graduating from Pennsylvania State University with a degree in Chemical Engineering, Bryce started his career in oil and gas with Halliburton and supported operations in CO, PA, MI, and WV. He has held various roles in management, completions and asset development with Chevron and Energy Corp. of America working in the Marcellus and Utica shales. Prior to joining BioSqueeze, Bryce was Drilling and Completion Manager for Chief Oil and Gas where he oversaw development operations up to the company's divestiture to Chesapeake Energy.





Zach Evans currently serves as Sales Director – Underground Storage for DarkVision, where he serves as global SME for underground storage and oversees the company’s continued expansion into the underground storage market, including both traditional hydrocarbon storage and adjacencies such as CCUS.

Mr. Evans has nearly two decades of midstream experience and began his career serving as a Senior Storage Engineer with the Columbia Gas / TC Energy family of companies, operating assets and managing capital budgets for the largest storage and pipeline company in North America. He later joined WSP as Vice President, CCUS & Reservoir Storage National Market Lead, where he oversaw all of the company’s depleted reservoir storage work, including engineering, compliance and project management, with national business development efforts in traditional storage, carbon sequestration, and hydrogen.

Mr. Evans is an active member of the North American underground storage community, having been a former member and two-time past Chair of the Southern Gas Association’s Underground Storage Committee, having served as a Team Lead for authorship of the 2nd Edition of API Recommended Practices 1170 & 1171, and is a former member of the Society of Petroleum Engineers’ International Board as the Regional Director for North America.



Mark Miller has over 45 years of experience relating to well testing and stimulation treatments in a variety of reservoirs including high permeability gas storage reservoirs, low permeability tight gas sands, and unconventional reservoirs (shale gas and coalbed methane). He has conducted well tests in North America, Europe, Middle East and Australia. Mark is a graduate of Penn State University with a BS Geology and post graduate courses in Petroleum Engineering. During his career he has worked for Dowell Schlumberger, Eastern Reservoir Services, and Cuadrilla Resources. In 2013 he founded FyreRok Reservoir Consulting where he currently serves as President and Sr. Consultant.

