Technical Committee Updates – Storage

Overall Goal:

How do you make a storage asset last 100 years?

2027 Goals

- Casing Integrity
  - Improve inspections
  - Repair methods
  - MIT advancements
- Salt Integrity
  - Improve sonars
  - Drilling and design improvements
  - Nearby orphaned and legacy wells

2026 Highlights

- **US-4-05A – Underground Storage Failure and Near Miss Trending (phase 2) - Complete**
  - Database of incidents and near misses compiled to inform risk-based maintenance approach.
- **US-4-06 – Temporary Wellbore Isolation by Inflatable Packers/Cement – Phase 1 - Complete**
  - Best practice document includes how plugs are being used, types of packers, cement, how to install and test, and finally determined a scope for lab testing in phase 2 (funded).
- **US-2-04 – Deep Cavern Abandonment - Ongoing**
  - Multi-year project to investigate the effects of abandonment in deep and tall salt caverns.
- **UGS-02-01** – Packer Type and Setting Techniques
- **UGS-02-02** – Investigation into causes and repair methods for micro annulus formations in wellbores

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2027 Storage Roadmap Projects

Orphan and Legacy Well Management

- Documented procedures to identify orphaned wells
- Risk mitigation and remediation options
- Review of available and emerging detection technologies, including drone-deployed magnetometers, FLIR cameras, LIDAR, sensitive metal detection, etc.
- Recommend standardized documentation and mapping requirements, including aerial overview maps, well locations, latitude/longitude coordinates, known depth, diameter, completion details, and leak or hazardous gas check results.

Construction of Subsurface Flow Barriers by Targeted Mineral Precipitation - Phase 1

- Solutions for using flow barriers in subsurface storage.
- Investigate the porosity-permeability relationship during the formation of flow barrier.
- Phase 1 - Lab-scale experiments to find construction techniques to build sub-surface geo-barriers. Evaluate process efficiency and analyze key injection parameters (flow rates, brine concentration).
- Phase 2 - Extend simulations to field-scale conditions to assess scalability and performance.

Nitrogen Impact on Embedded Salt Stability

- Determine the degradation mechanism occurring when caverns cycle between brine and nitrogen
- Quantification of how interbeds deteriorate—including anhydrite, shale, gypsum, and mixed impurity layers—under repeated nitrogen–brine cycling
- Guidance on the suitability of nitrogen-over-brine MITs, frequency limits, cycling, and alternative testing methods

Use of fiber optic for real-time level measurement in liquid storage wells

- Could a fiber optic cable be run in a well annulus and provide real-time level indication?
- Temporary installation of Fiber Optic cable(s) into a well. Cables will remain in place up to 2 months.
- Can the Fiber Optic sense the level interface of the LPG liquid to brine. These results will be compared to currently available techniques for determining the level interface to provide a data quality evaluation/validation.

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