



SAND2021-6320C

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NETL Well Integrity Workshop:

Identifying well integrity research needs for subsurface energy infrastructure

Session 4: *What are unique concerns for well integrity in challenging environ*

Moderated by Douglas Blankenship

May 25, 2021



NETL Well Integrity Workshop:

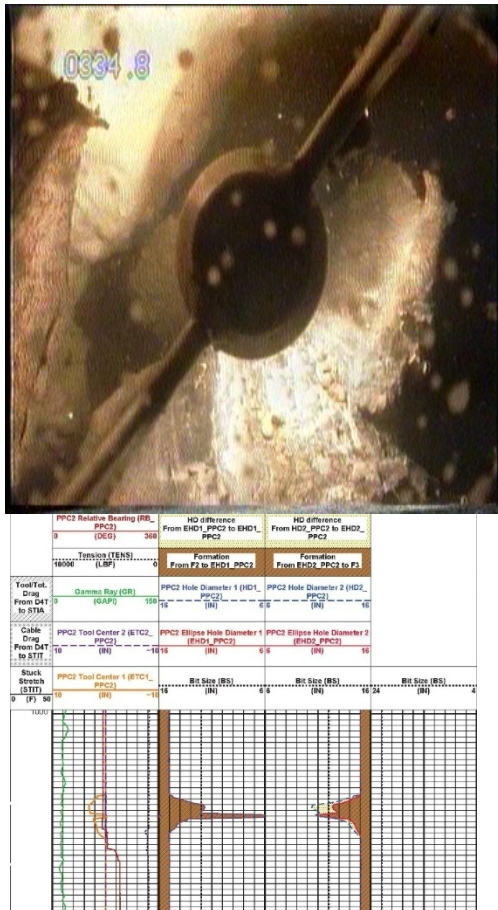
Identifying well integrity research needs
for subsurface energy infrastructure

May 18, May 25, and June 1, 2021

AGENDA (all times Eastern Daylight Time or UTC-4)

12:10–14:10	Session 4: <i>What are unique concerns for well integrity in challenging environments?</i>	
12:10–12:20	Introduction and Session Charge	Doug Blankenship (US DOE/GTO)
12:20–12:35	Cementitious Materials for High-Temperature Geothermal Wells – Recent Advances and Future Challenges	Tatiana Pyatina (BNL)
12:35–12:50	Hydrogen Storage in Offshore Sandstone Reservoirs – SINTEF's HyStorm Project	Pierre Cerasi (SINTEF)
12:50–13:05	Casing Deformation at the Big Hill SPR Site	Barry Roberts (SNL)
13:05–13:25	Session 4: Q&A	Doug Blankenship (US DOE/GTO)
13:25–14:10	Guided Breakout Discussions	
14:10– 14:20	Closing Remarks	Bob Dilmore (NETL)

Geothermal

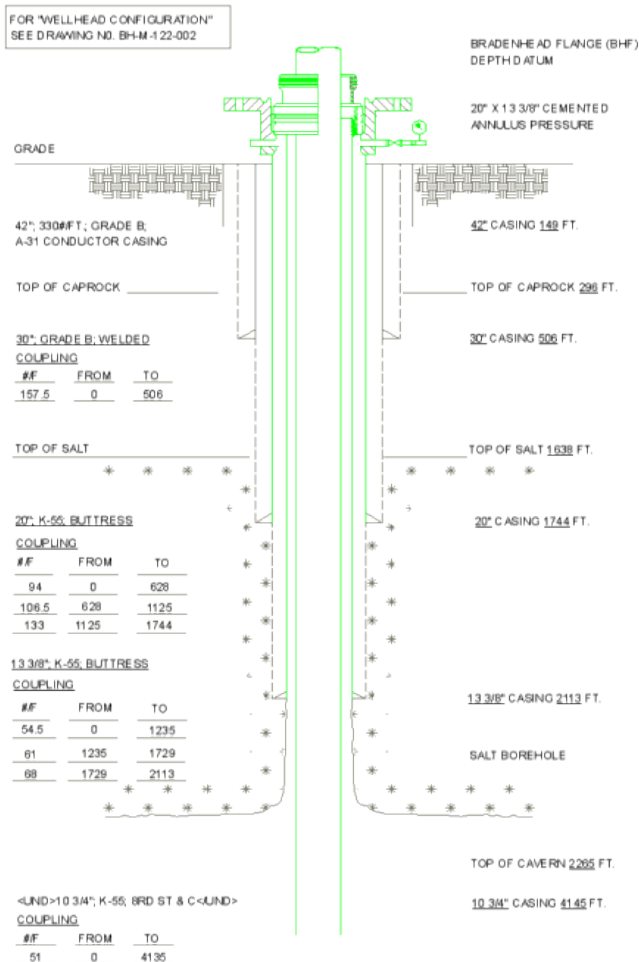


- Applications across temperature ranges and applications
- Temperature derating of casing
- Cement tolerance to temperature and chemistry
- Thermal Cycling
- Corrosive fluids – exotic materials
- All casing cemented to Surface
- Large diameters



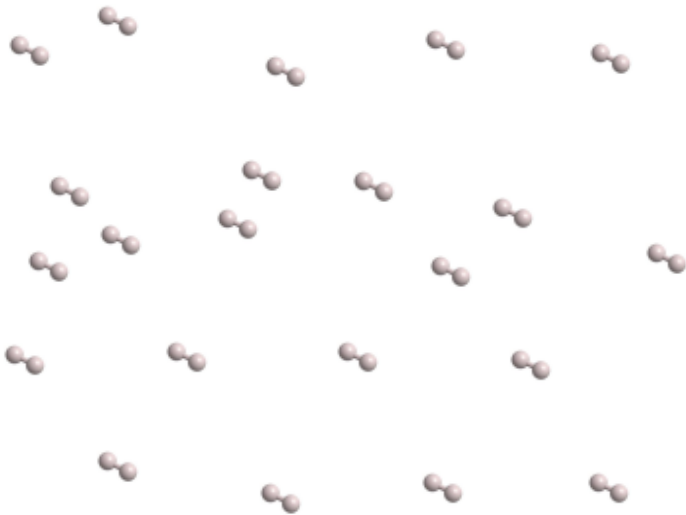
Courtesy of
Steve Pye

Hydrocarbon Storage



- Gas storage in salt beds/domes & depleted reservoirs/aquifer
 - ~400 facilities across in US, 80% in depleted reservoirs. Majority use repurposing of old wells ~80% constructed before 1980.
- Post Aliso Canyon, there was a renewed emphasis on system integrity
 - Interagency Task Force on Natural Gas Storage Safety provided recommendations (to deal with the unique nature of reservoir storage operations)
- Liquid Storage largely in salt beds/domes –
 - SPR – USG ~700MMbbl, Private capacity, much on the surface, ~500MMbbl.
 - LOOP ~60MMbbl
 - Many failed efforts in mined HR caverns

Hydrogen?



Salt Cavern Storage

- Commercial today
 - A couple site for underground storage in US salt domes
 - Salt cavern storage in UK

Reservoir

- Some pilot studies in sedimentary systems
- Look forward to hearing about the issues

- **Speculation of some issues**

- Containment
- Chemical - highly reactive & flammable
- Biology
- Compression costs/BTU
- Casing materials

Well Integrity Affects All

