資料6

HALLIBURTON

# 第2回次世代型地熱推進官民協議会

## 次世代地熱開発に向けたサービスカンパニーとしてのチャレンジ

July 15th, 2025

PSL Operations Manager: 遠藤　聡

# DID YOU KNOW

## WHAT GOES UP DOESN'T HAVE TO COME DOWN – ON SOMEONE'S HEAD.

HEALTH & SAFETY ENVIRONMENT
SAFETY MOMENT

At the job site, there's no excuse for dropped objects. To start with, all lifting equipment should be certified, inspected and properly operated to help ensure dropped object incidents don't occur.

Workers shall secure hand tools with a lanyard when there is a risk of dropping the hand tool and it falling 9 feet or more to a level below. It's critical that all elevated tools, parts and materials always be secured. In addition, once the job is finished, workers should double check to make certain no loose objects are left behind. And last but not least,a restricted area should always be established beneath suspended objects or work being done at height.

At Halliburton, solving customer challenges is second only to keeping everyone safe and healthy.

**Line of Fire**

**The Halliburton Life Rules are a set of core factors that affect personal safety that all Halliburton employees know and live by. These are key components for identifying and managing the hazards in our business.**

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# Agenda

**Date July 15th, 2025**
次世代地熱開発にサービスカンパニーとしてのチャレンジ

| | |
|---|---|
| 1 | Advanced Closed Loop: Geothermal Ranging |
| 2 | Super Critical Geothermal |
| 3 | Enhanced Geothermal |
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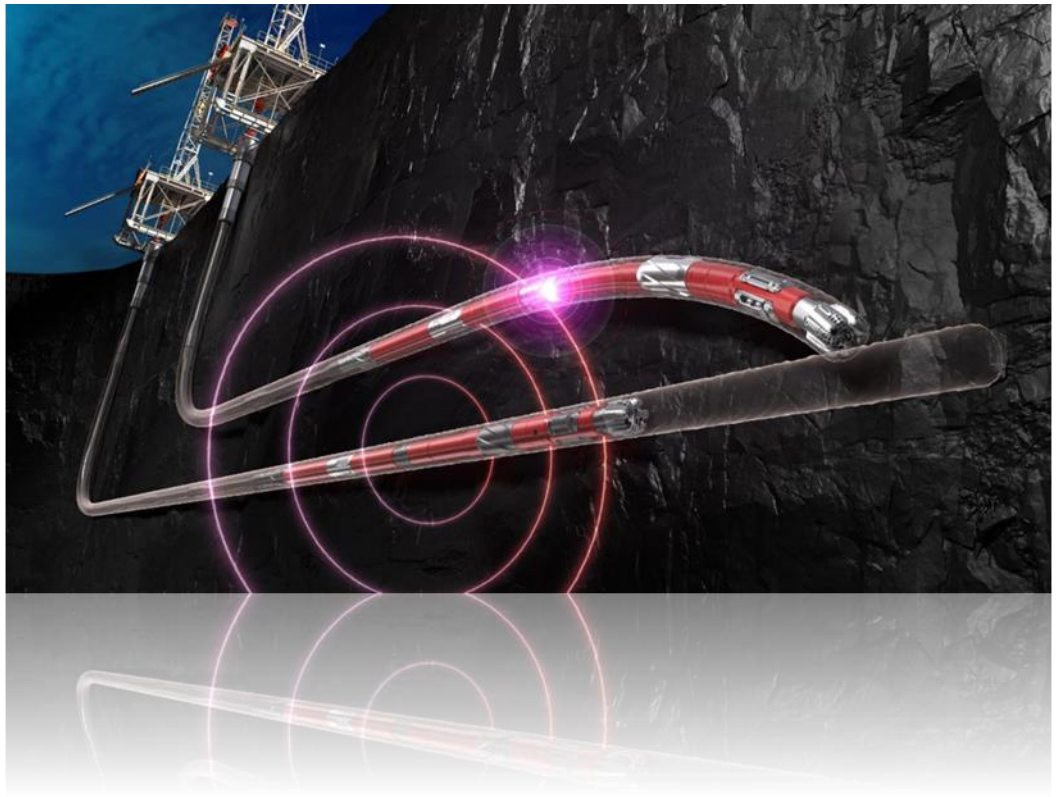
## Date July 15th, 2025 次世代地熱開発にサービスカンパニーとしてのチャレンジ

Advanced Closed Loop：Geothermal Ranging



- Solenoid based ranging system utilizes excess power from iCruise® RSS system to generate magnetic field.
- Signal is detected with BaseStar® MWD system.
- Continuous ranging while drilling – No flat time.
- No wireline needed –avoiding TPL operations which may cause the BHA to sit stationary for hours.
- Reduced personnel on location.

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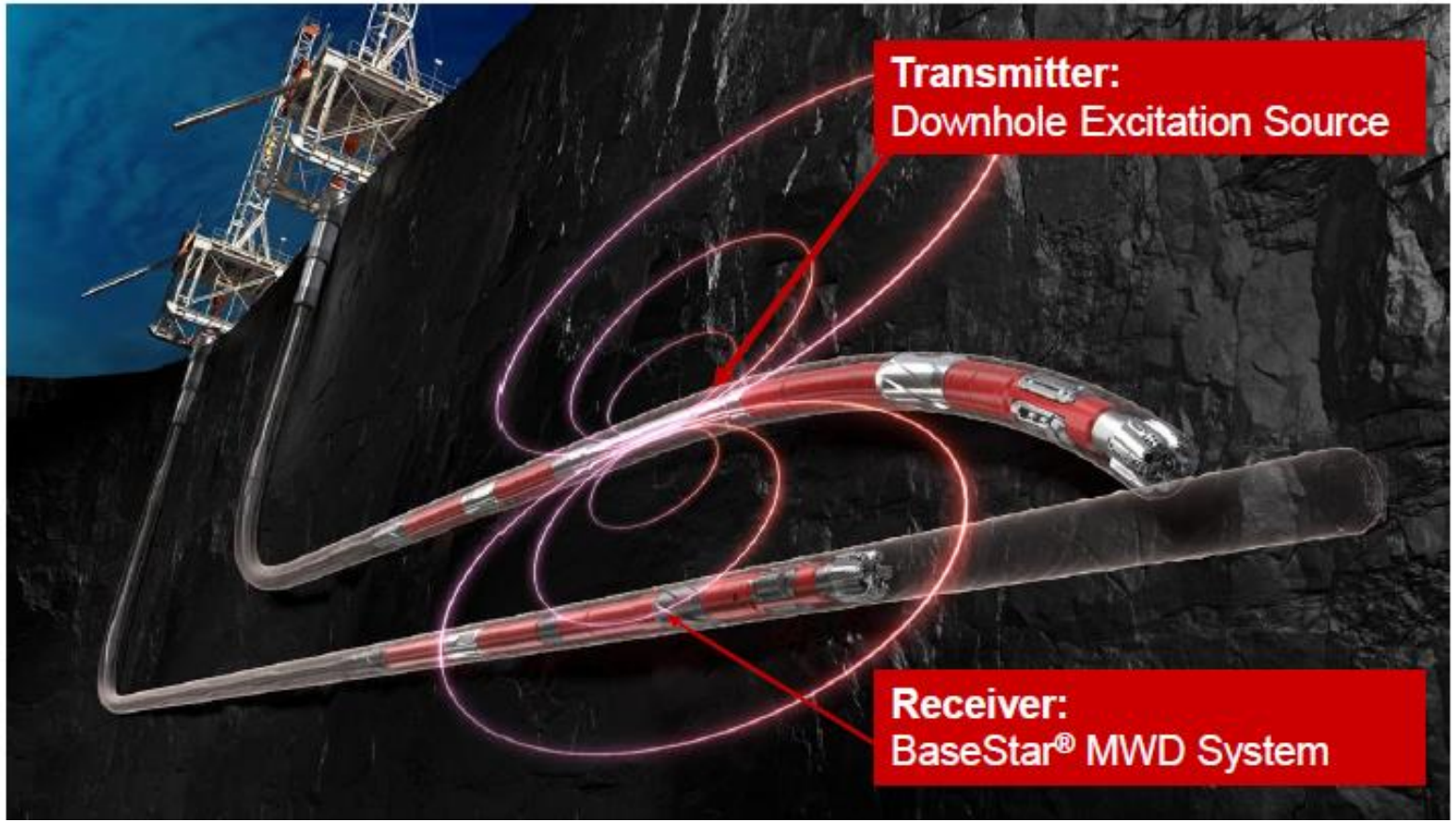
Advanced Closed Loop：Geothermal Ranging




- Detection Range: 0 – 400 ft (0 -120m).
- Utilizing two drilling rigs, a magnetic field can be generated in one, while detected in the other simultaneously.
- Active steering can position both wells within a desired range.
- System is designed for increased distance detection along with interception capabilities.



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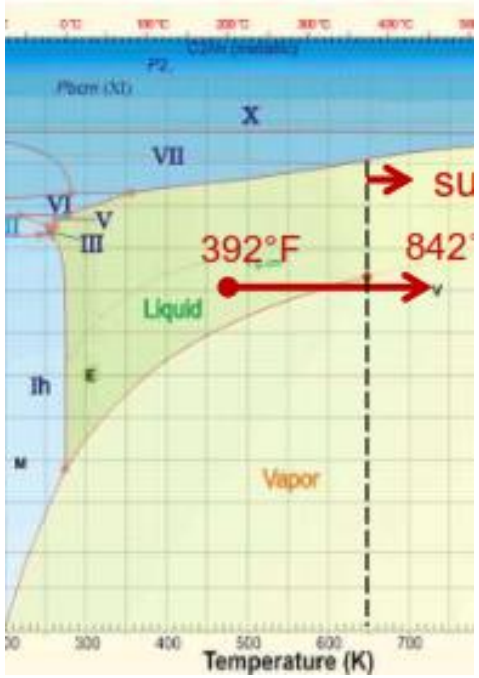
Super Critical Geothermal：None Portland Cement

- ThermaLock™ III
- Italy, Europe




- Challenge
  - Exploration of one of largest lava domes in K horizon
  - UHT/HP conditions at BHST > 842 °F (450 °C) and BHP > 3625 psi
  - Corrosive environment with presence of $H_2O$ in a supercritical state
- Solutions
  - Extended risk analysis and contingency planning
  - Tuned® Spacer III modified for HT conditions
  - ThermaLock™ III cement system controlled with a designed retarder
- Results
  - Design of Service resulted in flawless cement placement & execution
  - Actual BHCT ~ 392 °F (200 °C) and BHST ~ 743 °F (395 °C)
  - RT-data was in line with iCem® software simulation
  - Current state suggests good material integrity



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Enhanced Geothermal System

- ERD
- Oriented Fracturing
- Real Time Monitoring adjusting Operation


# THANK YOU



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