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## Fiber-Optic Sensing for Field Development Asset Integrity & Optimization Workshop

24–25th March 2026  
Ardoe House Hotel,  
Aberdeen, UK

# Enhancing Well Integrity with Disposable Fiber Optic Systems

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**WellSense**





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“Diagnostic operation completed in  
less than 14 hours vs 5 days with  
conventional methods”

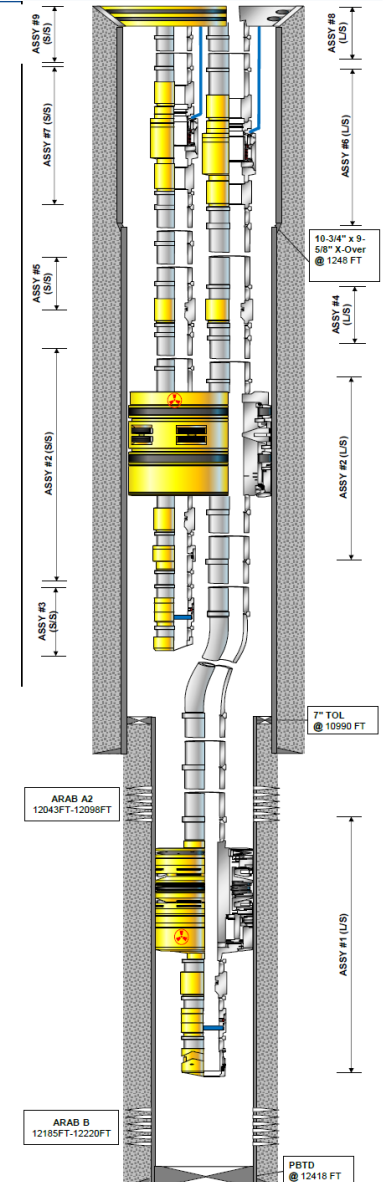
**Well:** Offshore Dual-string Gas Injector. High H<sub>2</sub>S content, circa 7%, combined with high injection pressures of 5,500psi

**Objectives:** To establish the cause of sustained pressure in the A-and B- annuli.

**Solution:** Deployment of 2 dynamically despoiled fibres in the long string to record DAS and DTS for leak detection survey.

**Challenges:** Small weather window for logging because of high H<sub>2</sub>S content. Identification of leak in dual string completion.

Location	Process	Duration
B - Annulus	Bleed down and pressure build up monitoring	90 mins
A - Annulus	Bleed down and pressure build up monitoring	270 mins
	Injection into short string and annuls pressure monitoring	150 mins
	Bleed down and pressure build up monitoring	90 mins



Plug and play  
adapter



FLI probe  
housing bare  
fibre optic  
>12,000ft SM  
and MM

Pressure  
containing  
launcher



Aluminium  
probe  
unspools fibre  
optic cable  
during well  
deployment

Hydraulic  
release hose

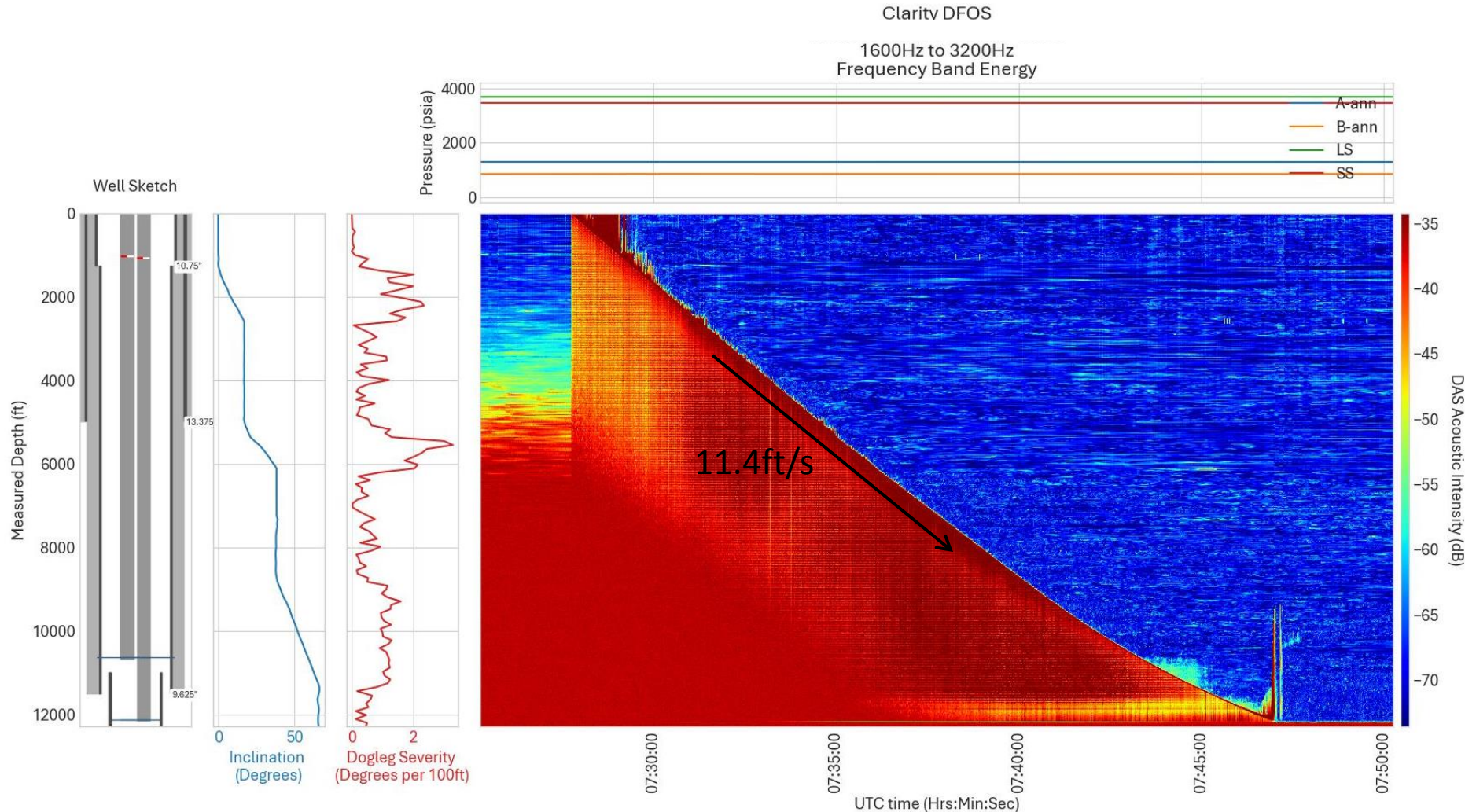


Fibre-optic  
cable  
connector.

Lubricator

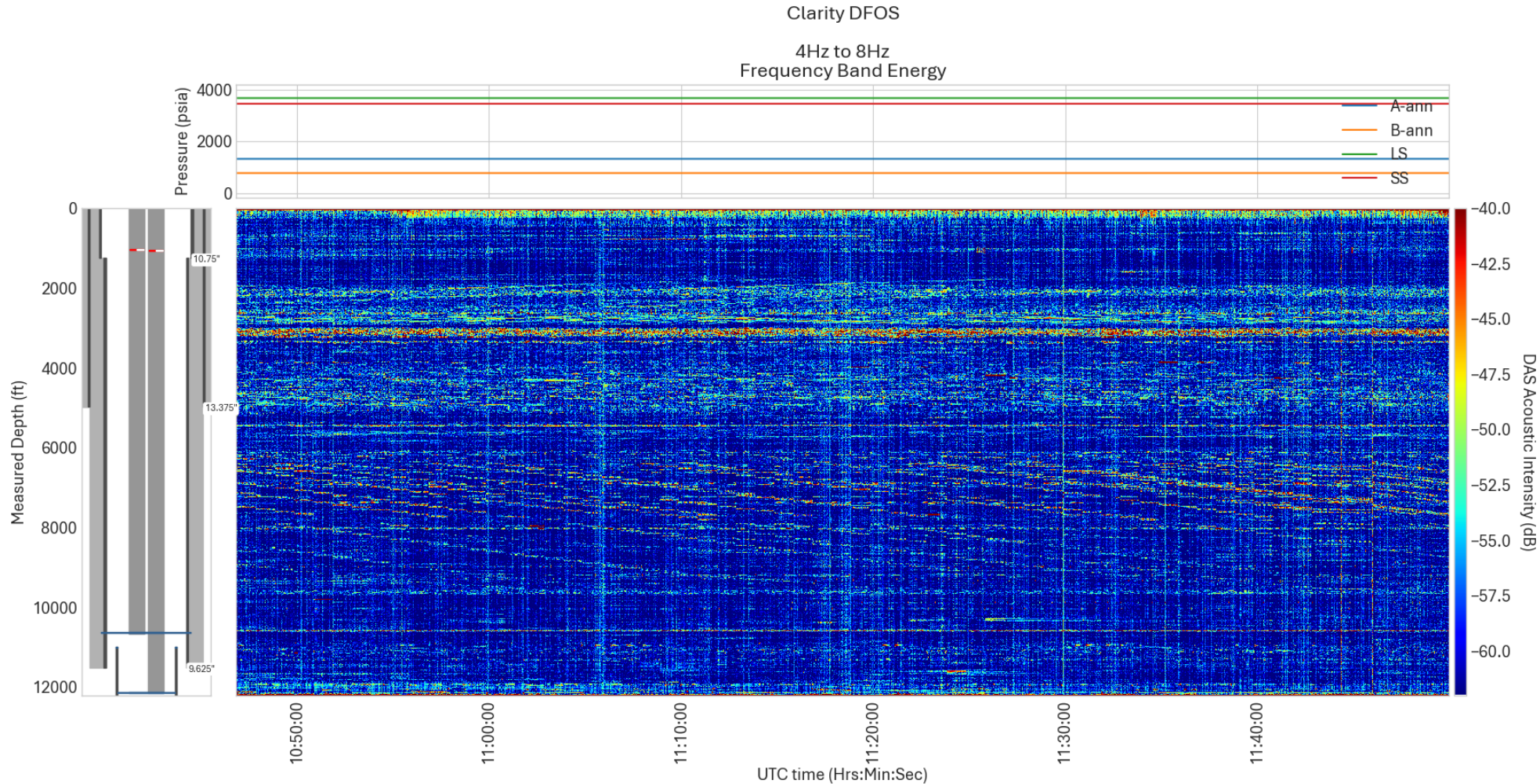


## RIH DEPLOYMENT



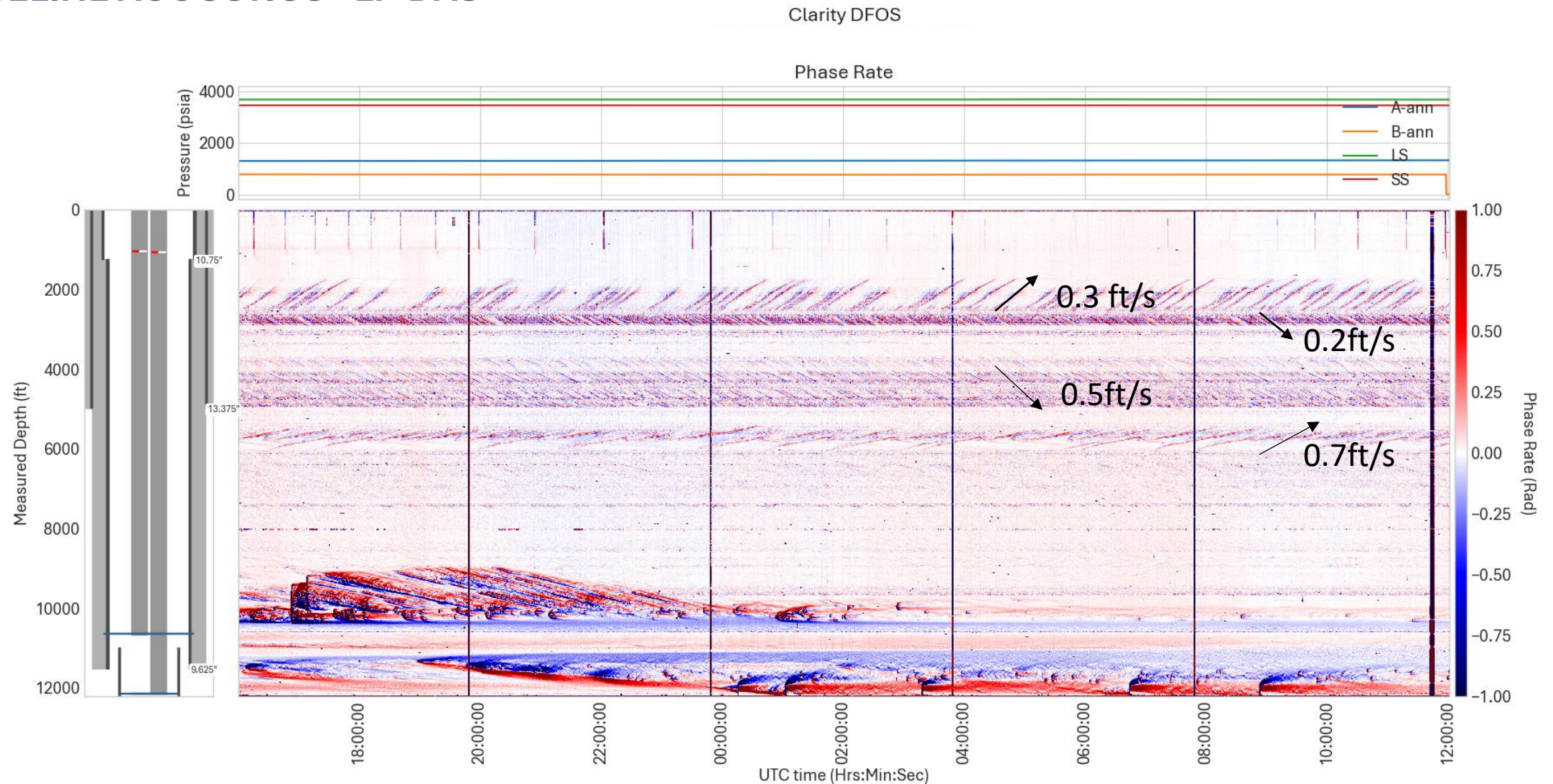
- Land-out depth: 12,165 ft
- Transit Time: 20min
- Fli probe average velocity 11.4 ft/s
- Gas filled Tubing

## BASELINE ACOUSTICS - FBE

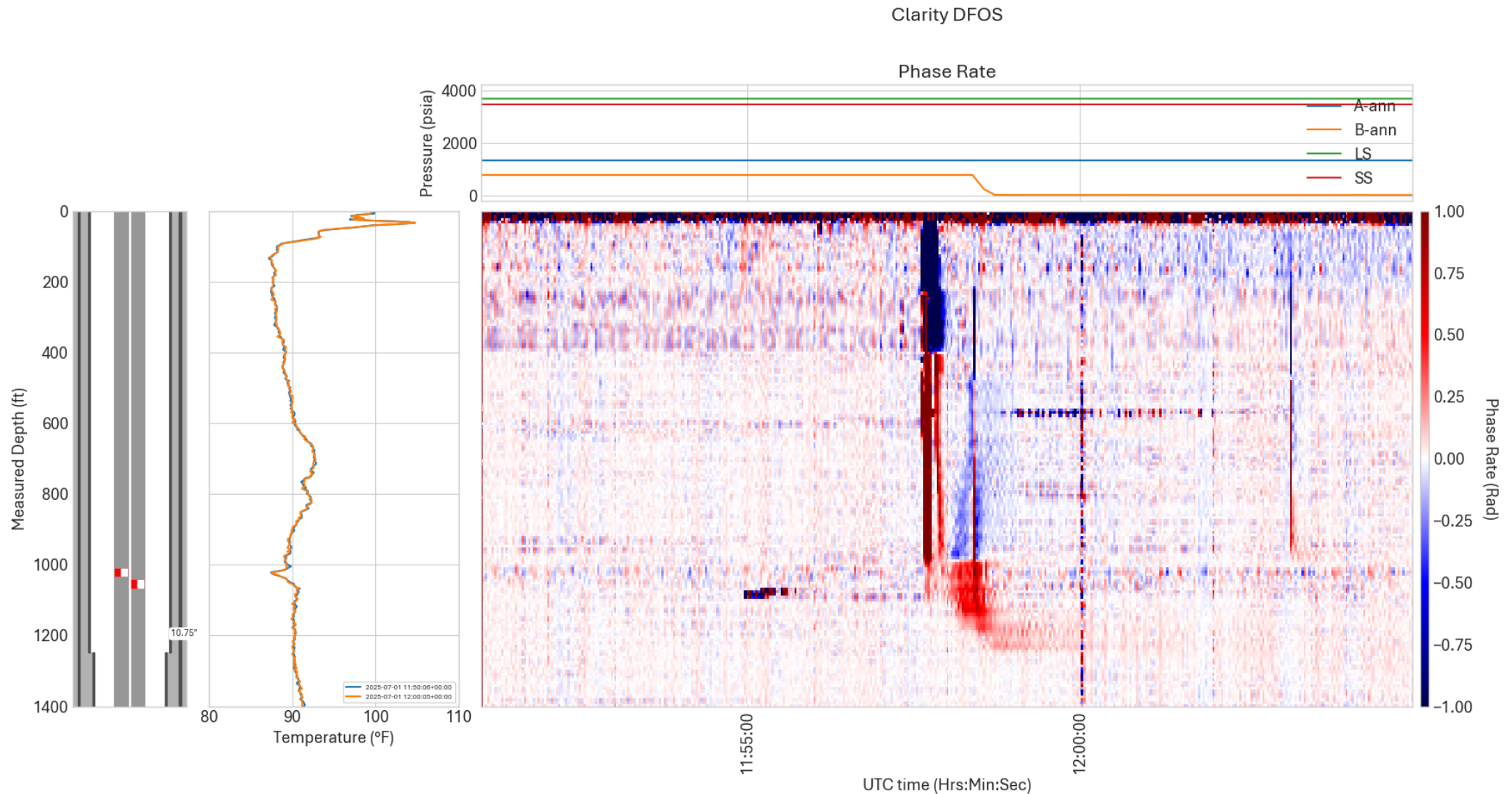


- The baseline survey confirms well stabilisation post deployment and provides the background acoustic signature of the well
- Gas filled tubing provides a low acoustic signature

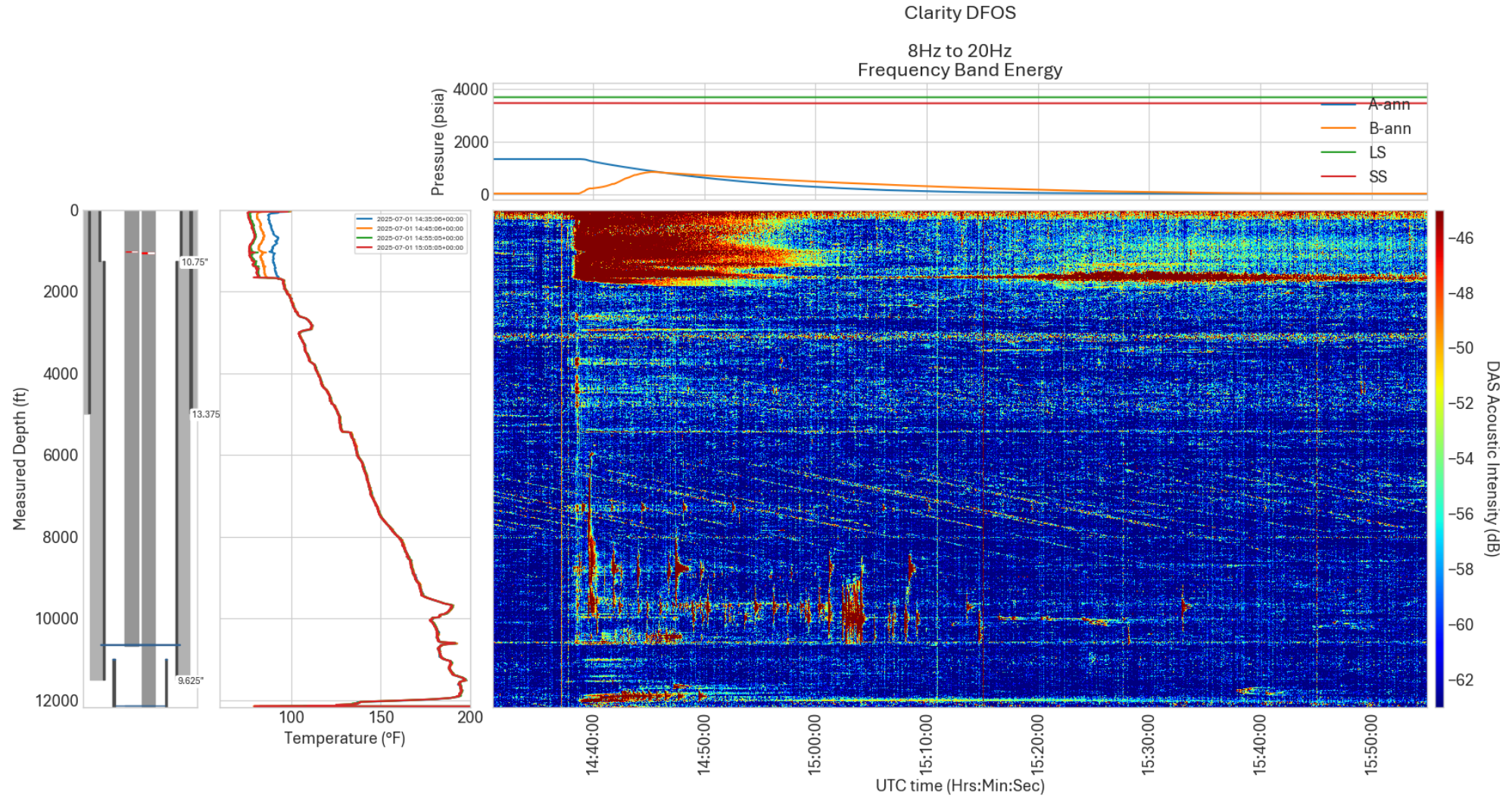
## BASELINE ACOUSTICS - LF-DAS



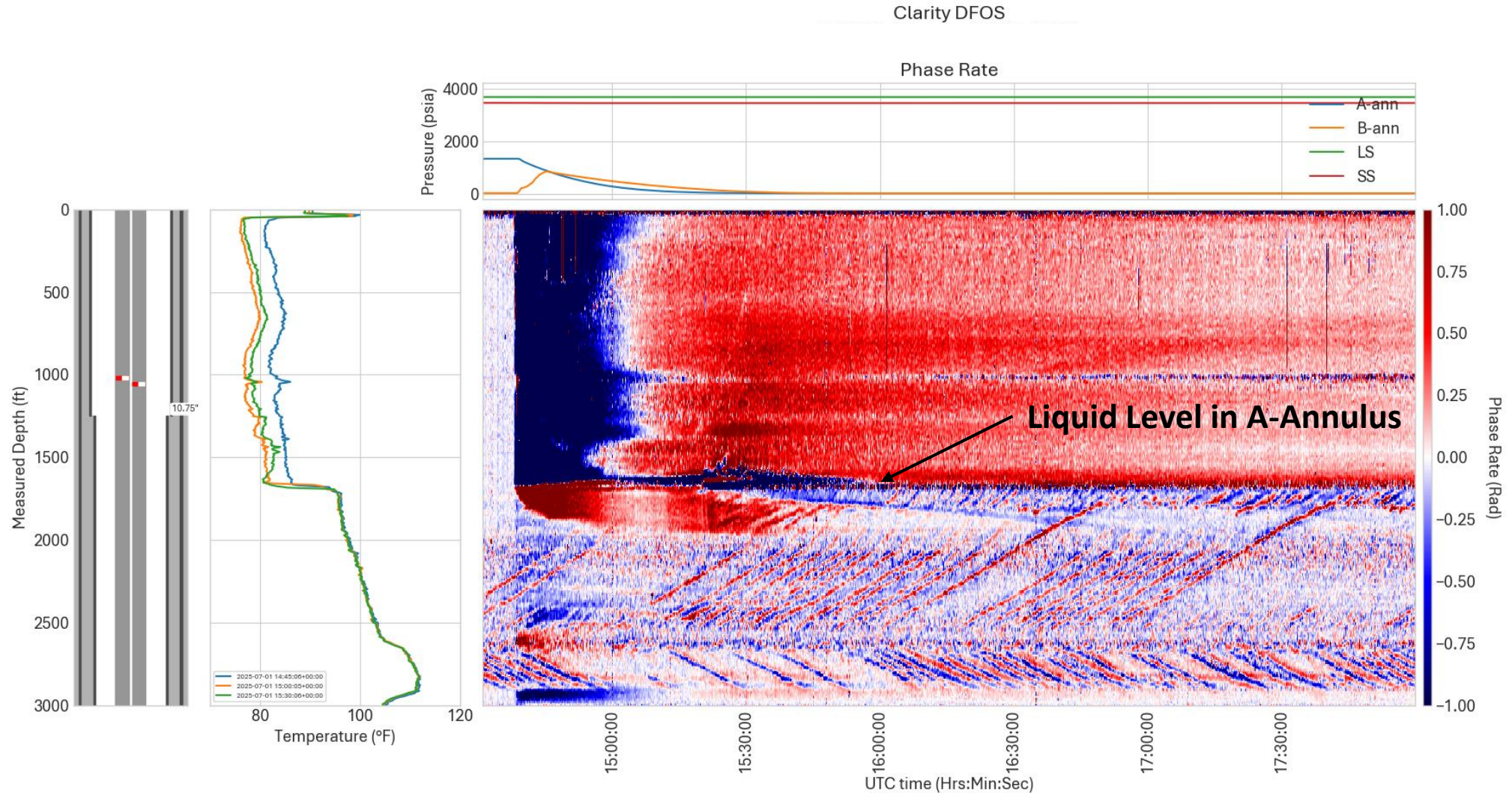
## B-ANNULUS BLEED DOWN



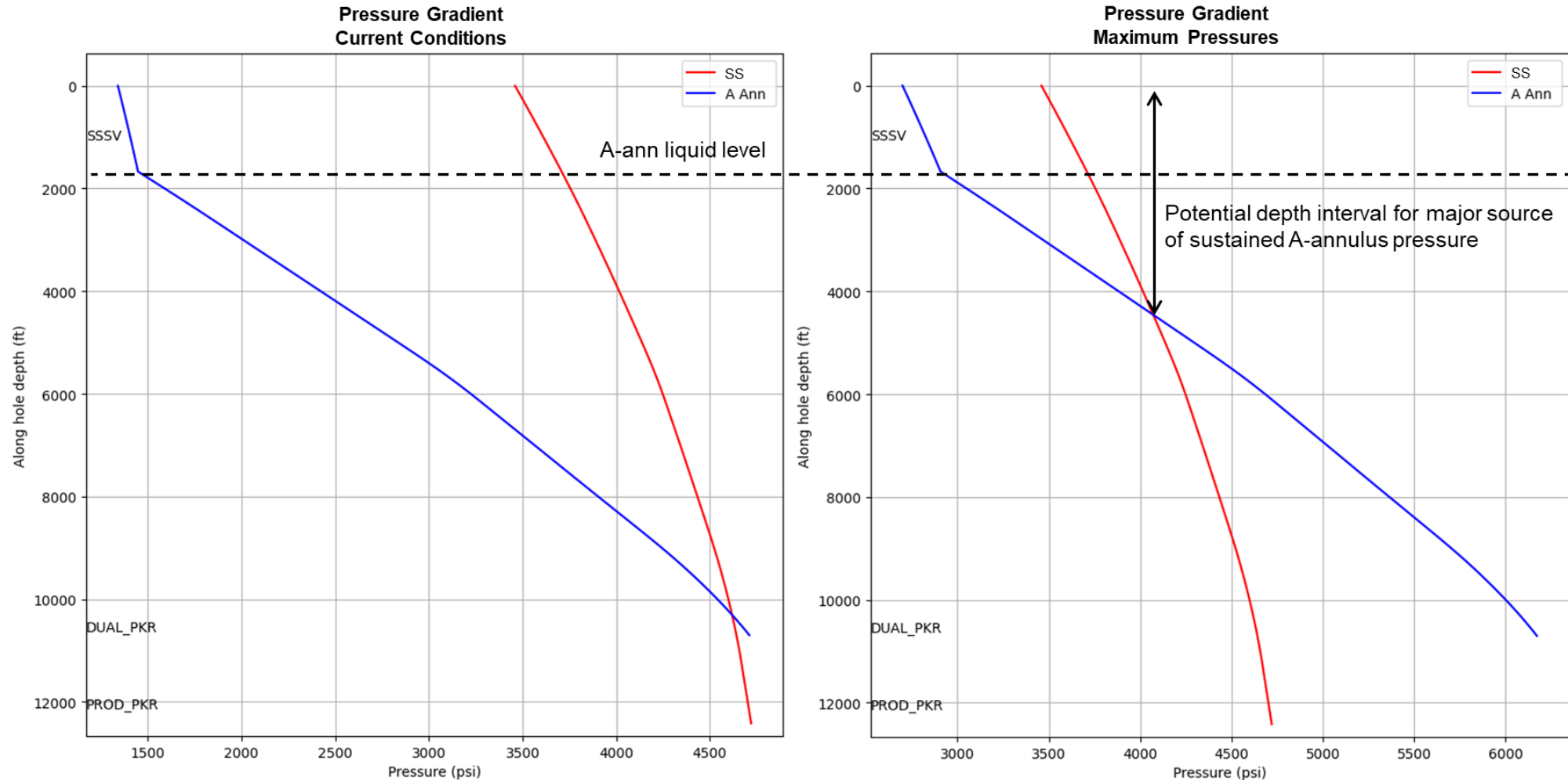
## A-ANNULUS BLEED DOWN



## A-ANNULUS BLEED DOWN

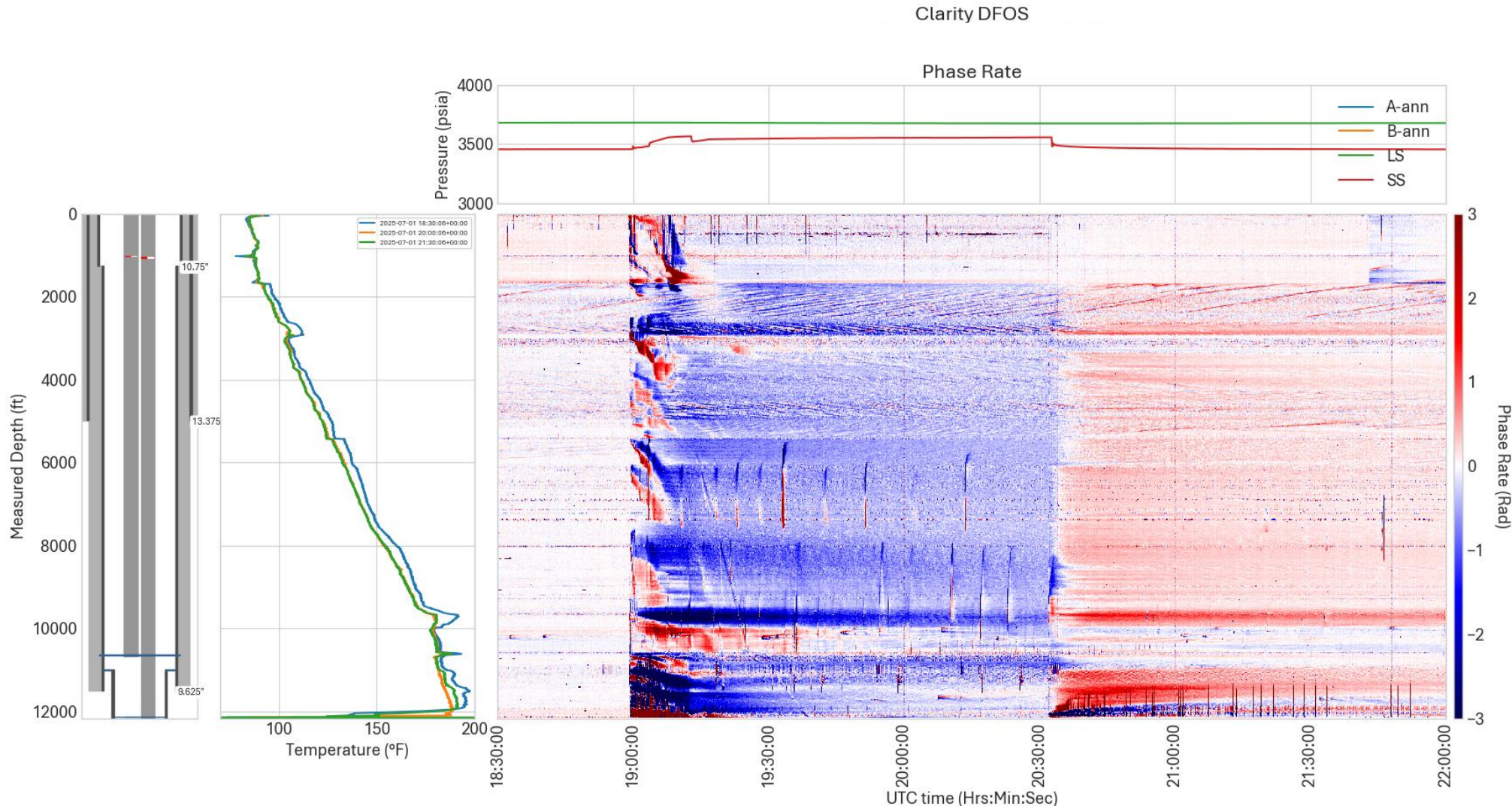


## HYDROSTATIC PRESSURE ANALYSIS





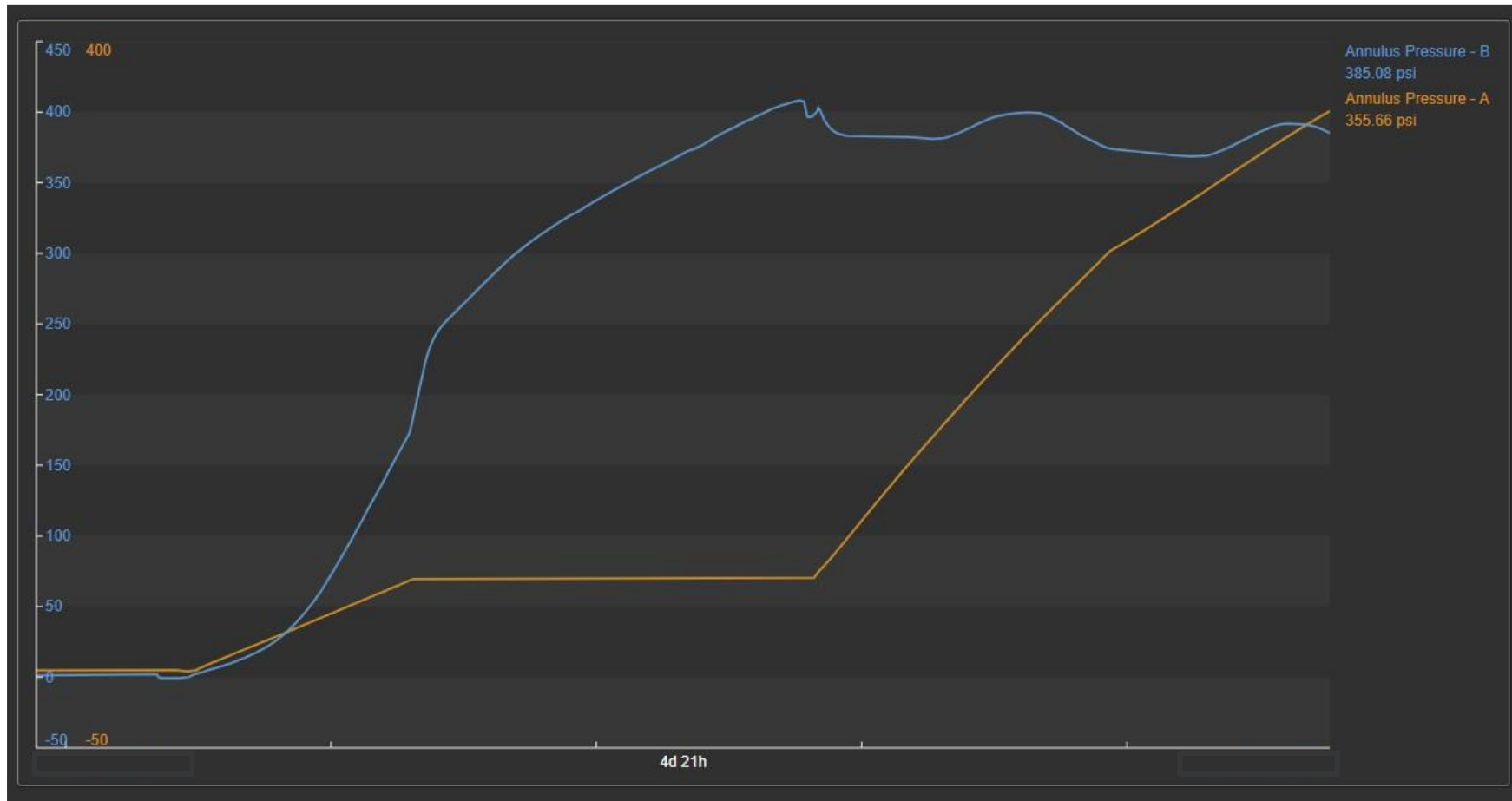
## SHORT STRING INJECTION



Multiple leak sources in the short string were identified at:

- 1,655ft
- 2,610–2,630 ft
- 2,910–2,920 ft
- 5,425–5,435 ft
- 9,674–9,678 ft

## POST SURVEY TESTING



- After the short string was displaced with diesel, a clear cessation in the A-annulus pressure build-up rate was observed once the displacement was completed, confirming the short string as the source of the leak.
- Since the B-annulus has a separate leak source, its pressure continues to build up.



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### SUMMARY

- Multiple leaks detected across short string, long string, and annuli in a single run survey. Short-duration leaks (lasting seconds) successfully identified, avoiding repeated interventions.
- Accurate fluid level identification in Annulus-A by DAS/DTS, validated by strain rate transitions and bubbling at zero pressure.
- One-pass, continuous monitoring along entire well length enhances confidence in leak source localisation and detection of instant events related to changes in well state and pressure changes at surface where conventional methods might struggle.
- Diagnostic operation completed in less than 14 hours vs 5 days with conventional methods. Medium-risk classification avoided unnecessary shut-ins or costly interventions.
- Rigless, lightweight, and non-intrusive system reduces operational emissions and supports decarbonisation strategies.
- Reduced deferred production and lower job costs due to faster, more efficient diagnostics.



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### Acknowledgements

**Ahmed Abdalla** – ADNOC Offshore

**Fatema Al Zaabi** – ADNOC Offshore

**Abdelrahman Gadelhak** – ADNOC Offshore

**Sima Li** – ADNOC offshore

**Paul Lynch** – WellSense

**Julia Fesina** – WellSense

**David Shearer** – Wellbore Integrity Solutions

**Siheem Diguer** – Wellbore Integrity Solutions

**SPE-228898-MS** - Enhancing Well Integrity with Disposable Fiber Optic Systems: A Unique Intervention Technique for  
Offshore Operations – Nov 2025



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# Thank You

We Welcome Your Questions!