UHR3D
Reducing Offshore Drilling and Production Risk

AGU Fall Meeting
December 2014
San Francisco, California
UHR3D – Ultrahigh Resolution 3D

Survey area
Data acquisition
Data processing
Penetration
Bandwidth
Resolution
SAFE-BAND UHR3D

A new paradigm for geohazard assessment; regional multi-client survey focused not only on individual well site hazards, but also on illuminating geohazard trends over a large area

Ultrahigh resolution 3D (UHR3D) utilizing the P-cable system

Patented integrated navigation system – NavPoint Trawler

Partnership:  NCS – data acquisition and navigation/positioning
               Geotrace – data QC and processing
               Spec Partners – sales and licensing
Acquisition Parameters

- 18 x GeoEel Solid Cables at 12.5 m crossline spacing
- 16 groups/cable at 6.25 m spacing
- 12 phones/group providing > 5 Hz to 3 KHz
- Sample interval $\frac{1}{4}$ msec (processing sample interval $\frac{1}{2}$ msec)
- Cable depth of 2 m
- Single 210 cubic inch GI gun source
- Source depth of 3 m
NavPoint Trawler

GPS on energy source, paravanes, and “tri-points”
Magnetic compass in each junction box and at the tail of each streamer
Patented navigation solution
Post Migration Processing

Noise Elimination

Statics (Tidal, Gun Timing, etc.)

Post Stack Time Migration

Post Migration Processing
Safe-band objectives

- Penetration

2 seconds
Safe-band objectives

100-125Hz
Dominant Frequency

Hz @ -10dB

• Penetration
• Bandwidth

2 seconds
Safe-band objectives

- Penetration
- Bandwidth
- Resolution
Safe-band objectives

- Penetration
- Bandwidth
- Resolution

2 seconds
Safe-band objectives

- Penetration
- Bandwidth
- Resolution

~40m beds

~5m beds

2 seconds
Vertical and Horizontal Resolution

Gas and Faulting

MTD
Vertical and Horizontal Resolution
Top of Mass Transport Deposit

3.2 m

22 m
Interpreted Top of Mass Transport Deposit
Vertical and Horizontal Resolution
Gas Anomaly and Faulting

7.2 m

72 m
Why 3D?

- Penetration
- 3D Coverage
- Bandwidth
- Resolution

Dominant Frequency: 200Hz @ -10dB

Why 3D?

- ~5m beds
- ~40m
- 25km
- 40km
UHR2D Line Spacing
Gas Anomaly and Faulting

200 msec

300 m
Early, Moderate Flux (1)
High Flux (2)
Moderate Flux – Buried/Vertically Expansive Hydrate (3)
Moderate Flux – Outcropping Hydrate (4)
Late, Low Flux – Collapse(5)
Legacy 2D
No SRME (Input)
With SRME (Output)
Difference No SRME vs SRME
No SRME (Input)
With SRME (Output)
Difference No SRME vs SRME
No SRME (Input)
With SRME (Output)
Difference No SRME vs SRME