ISCWSA
Well Intercept Subcommittee

Roger B. Goobie

WISC Chairman

2015 - 2017

The Industry Steering Committee on Wellbore Survey Accuracy (ISCWSA)

46th General Meeting
October 12th, 2017
San Antonio Texas, USA

Attendance

Highlights

1) Average turn out due to the current state of the industry

2) Reduction in participation ~ 40%

3) No new members added to the team

S/N	Name	Affiliation
1	Roger Goobie	BP
2	William Allen	BP
3	Mike Long	BHGE
4	Wayne Courville	Boots & Coots
5	John Hatteberg	Boots & Coots
6	Son Pham	Conoco Phillips
7	Avinash Ramjit	Conoco Phillips
8	Heatrher Vannoy	EOG
9	Patrick Knight	Halliburton
10	Pete Schiermeier	Halliburton
11	Robert Estes	Halliburton
12	Patrick Walker	MagVar
13	Benny Poedjono	Schlumberger
14	Chad Hanak	Superior QC

Agenda

- Recap
  - Mission
  - Where are we at?
- Acoustic Ranging (SPE 187313)
  - Presentation by Benny and Bill
- eBook Update
  - Final Edits
- The way forward!
  - New Focus
  - Dissolve Subcommittee
- AOB

Mission

"To disseminate knowledge related to ranging technology, techniques and methods that provide value to the industry for relative wellbore positioning."

With a focus on the following areas:

- Enhance safety and production
- Wellbore avoidance
- Wellbore intervention
- Plug and Abandon operations
- Contingency preparation
- Emergency response

SPE187313 – Active Acoustic Ranging

Active Acoustic Ranging (AAR)

What is it?

Why do we need it?

Summary

- The paper discusses the ranging results obtained from an Access-Independent (AI), AAR system in a salt formation.
- The system was tested to expand the industry's available and reliable ranging options for Contingency Relief Well (CRW) response, specifically in salt formations, for both cased and open hole.
- The results indicate ranging performance for relief well application in salt that is superior to other commonly used commercial ranging systems.
- The results encourage future work to extend the possibility of well-to-well ranging in other than just salt formations.


Society of Petroleum Engineers

SPE-187313-MS

Active Acoustic Ranging to Locate Two Nearby Wellbores in Deepwater Gulf of Mexico

Benny Poedjono, Samer Alatrach and Albert Martin, SPE, Schlumberger; and Roger Goobie, William T. Allen, and Eugene Sweeney, SPE, BP

This paper was prepared for presentation at the 2017 SPE Annual Technical Conference and Exhibition held in San Antonio, Texas, 9-11 October 2017.

Abstract

Salt drilling in Deepwater Gulf of Mexico (GOM) presents unique challenges. One of these challenges is the effect salt has on ranging technologies used in contingency relief well designs. A new technique called Active Acoustic Ranging (AAR) addresses the challenge of locating and tracking the target wellbore to the interception phase. This case study details the degree of precision that this new technique provided while locating two nearby wellbores within salt. This study is intended to improve industry awareness and understanding of relief well ranging options available to the industry, specifically wellbore ranging activities conducted within a salt formation.

Sonic logging started in the early 1930s to determine rock characteristics by measuring the refracted signals from a combination of transmitters and receivers. The technique evolved by recording acoustic signals beyond the refracted zone, by positioning the transmitters and receivers downhole in the logging tool.

AAR utilizes surface seismic processing methods to determine azimuthal direction and distance of compressional and shear acoustic signals, reflected from around the borehole. After processing the reflected signals, the distance and direction of nearby wellbores can be determined. This can be effective in salt formations, where resistivity inhibits use of active electromagnetic ranging tools.

This case study presents test results conducted in a GOM Deepwater operation to locate two nearby wellbores, a cased hole and an open hole, using AAR. It shows that AAR signals can be successful in locating offset wellbores within salt formations. The acoustic signals, both compressional and shear, were recorded using a stack of 13 receivers. Each stack had 8 sector azimuthal receivers to determine the distance and direction of the corresponding target wellbores.

By utilizing compressional and shear signals generated from the various distances of monopole and dipole transmitters, a redundant process was provided to determine the location of the target wellbores with a high degree of accuracy.

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WISC Milestone

43rd

- Complete 1st draft of guide
- Publish guide on ISCWSA.net

44th

- Assemble team to write SPE paper
- Build upon the work done on SPE17309

45th

- Deliver SPE paper to the industry
- Deliver eBook on Well Intercept

SPE WTPS / Halliburton Agreement

Highlights

1) Agreement reached between SPE ISCWSA and Halliburton on 27th October 2015.

2) To use the Halliburton document “Customer Guide to Relief Well Ranging” without any copyright violation.

3) Liability disclaimer wrt the use of the information the SPE produces.

4) SPE agree to provide Halliburton with a draft copy of the final document for their approval before publication.

HALLIBURTON

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Date: 27 october 2015

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Accepted and agreed by SPE this 27 day of October, 2015.

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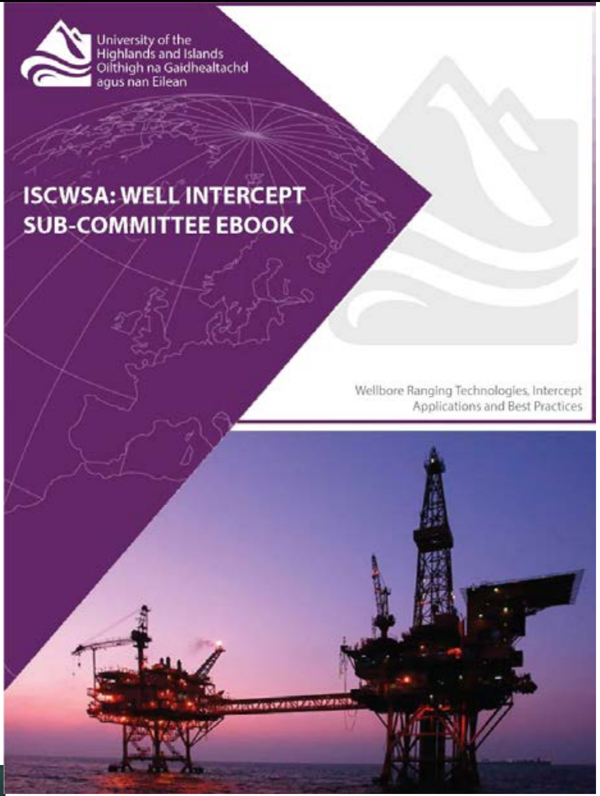
ISCWSA

WISC eBook

- Completed
  - Wellbore Ranging Technologies Intercept Application and Best Practices
- Ready for Download
  - http://www.iscwsa.net/docs-and-publications
- Current eBook
  - Eight Main Chapters
- Lexicon
  - No Change
- Bibliography
  - Updated with additional publications



WISC eBook TOC

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WISC eBook Lexicon and Bibliography

Well Interception Lexicon

Word/Phrase/Symbol	Definition
Absolute Positional Uncertainty	Three dimensional position uncertainty with respect to a defined local reference point.
Active Acoustic Ranging	A technique that utilizes direct bursts of acoustic energy toward an acoustic reflector generally an open hole or cased hole wellbore. The reflected signal time is measured to determine the distance. The direction of the reflected signal is determined by the reflected azimuth relative to the tool position or the surface seismic source and receiver arrangements.
Active Magnetic Ranging	Any well-to-well ranging technology that requires the induction and detection of a magnetic field between two wellbores.
Allowable Deviation from Plan (ADP)	The maximum distance in 3D space that an as drilled wellbore may deviant from the directional well plan.
Attack Angle	See Angle of Incidence
Angle of Incidence	The relative angle between two wells, expressed in degrees (°), which defines the total angular difference in the well trajectory vectors. Can be expressed as a two or three dimensional difference(s) and having either converging or diverging vectors. Typically used to describe the angle present between the RW and the TW during ranging operations and when attempting to make the final intersection.
Blowout Well	A wellbore that may be completed or is being drilled in which hydraulic control has been lost resulting in a need to kill the well. Also referred as Target Well or Subject Well.
Bxy	Magnitude of the magnetic field measured perpendicular to the relief wellbore direction.
Call Box	The distance and direction to a target, projected in the plane normal to the RW or IW on a horizontal (TVD) plane that incorporates best estimates of the ranging result and its uncertainty.
Capping	A surface intervention technique which allows the blow out well to be capped and brought under control without the need to drill a relief well.
Completion Recovery	The use of ranging technology to drill a new wellbore that communicates with a target wellbore for the purpose of gaining further utilization of the completion of the target well (for instance, the fracture job of the target well).
Cone of Uncertainty	A 3 dimensional area of positional uncertainty in the form of a cone where the central axis of the cone aligns with the downhole axis of the wellbore and the base is located at the deepest measured depth of the wellbore. Cones of uncertainty are typically defined by degrees per distance or lateral error per distance.
Contingency Relief Well Plan	A document which describes the plan of implementing a relief well project to solve an uncontrolled blowout well condition.

Well Interception Bibliography

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eBook Acknowledgements

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What's Next?

The way forward!

- Nominate New Chairman
- New Focus
- Dissolve Subcommittee

Thank You!

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