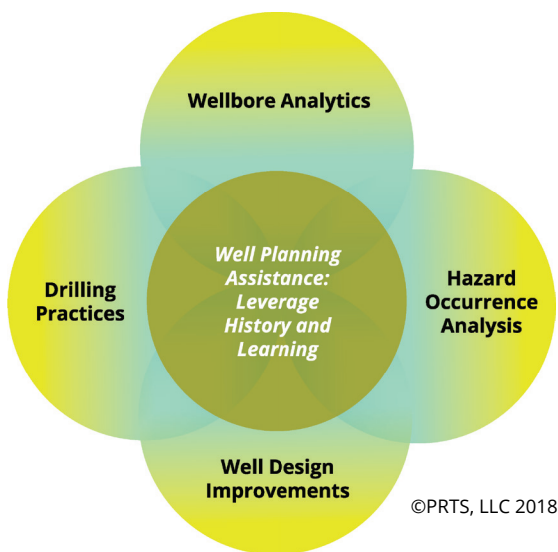


INTRODUCING DIGITAL DRILLING FORENSICS

Using Digital Data for Well Planning and Execution



- WITSML data has a value beyond initial drilling
 - Use digital WITSML data mining to improve performance, reliability, and safety.
- Digital Drilling Forensics (DDF) can import and analyze any past or present WITSML data stream.
- DDF's unique fast forward mode enables viewing a historical well as if in real time with notifications of watches and alarms preceding hazards as they evolve.
- DDF Capabilities and Value:
 - Perform Data Analytics via DDF to improve well planning, design, and execution.
 - Utilize DDF to significantly improve drilling crew pre-spud plans and daily risk plans.
 - Validate root causes of lost time incidents and quantitatively assess drilling efficiency.
 - DDF saves significant time and money in creating detailed well reviews.
- DDF is unique and effectively assists in planning your next well or wells.
 - Get value from your data - if WITSML or CSV data is available from either the Operator or service company files DDF can facilitate a detailed well review of the entire well in days rather than weeks.
 - Understand and pinpoint the reasons for repeat or significant incidents: stuck pipe, lost circulation, kicks, unscheduled sidetracks, loss of wellbore, loss of well.
 - Validate recommendations to make changes to the drilling plan or field practices.

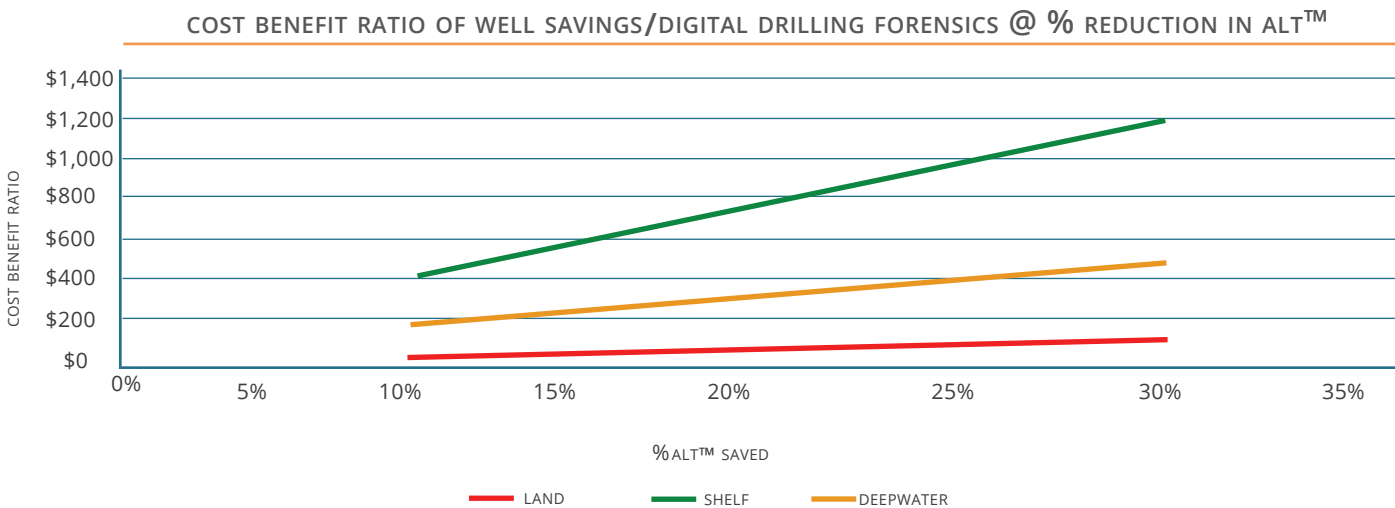
Key Questions:

DO YOU HAVE FORWARD CAMPAIGN AREAS WHERE LESSONS AND ROOT CAUSE COULD PROVE EFFECTIVE IN IMPROVING PERFORMANCE, RELIABILITY AND SAFETY?

- Are there areas where cost have been difficult to contain: excessive time off the critical path?
- Is WITSML or CSV data available and or can it be exported to CSV files?
- Are there areas where there have been repeated hazards occurring: stuck pipe, lost circulation, kicks, unscheduled side tracks, loss of wellbore, loss of well?

DIGITAL DRILLING FORENSICS

		LAND	SHELF	DEEPWATER
Well Cost: MM\$		10	100	400
Dry Hole Cost: MM\$		5	50	200
Campaign Engineering DDForensics: K\$		20	30	50
Digital Assistant % Cost of Well		0.40%	0.06%	0.03%
Total Well Reduction in Avoidable Lost Time: %				
	10%	20%	25%	30%
LAND	\$500,000	\$1,000,000	\$1,250,000	\$1,500,000
SHELF	\$5,000,000	\$10,000,000	\$12,500,000	\$15,000,000
DEEPWATER	\$20,000,000	\$40,000,000	\$50,000,000	\$60,000,000
Digital Drilling Forensics % Cost of Well				
COST BENEFIT RATIO OF WELL SAVINGS/DIGITAL DRILLING FORENSICS @ % REDUCTION IN ALT™				
LAND	25	50	63	75
SHELF	167	333	417	500
DEEPWATER	400	800	1,000	1,200



KEY MANAGEMENT PERSONNEL

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