



ENHANCED
DRILLING

EC-Drill[®]

Managed Pressure Drilling system



Simply take control

Under pressure?



EC-Drill® Simply take control

Discover the easier approach to MPD

EC-Drill® from **Enhanced Drilling** is a step-change technology that enables operators to 'drill the undrillable well'. It is suitable for use off semi-submersibles, drill ships and jack-ups.

It solves a challenge commonly encountered in many deepwater wells - drilling within a narrow pressure window.

With traditional drilling techniques, the slightest excess or lack of wellbore pressure while operating in a narrow window can mean the difference between success or failure: too much pressure and the formation will fracture, leading to losses; not enough will lead to hole instability and increases the chances of an influx.

GREATHER CONTROL IN DEEPWATER WELLS

EC-Drill® offers a higher degree of control in just this kind of scenario, enhancing safety and enabling operators to cost-effectively negotiate the narrow pressure window and hit deep targets that are simply impractical to reach with traditional techniques.

EC-DRILL® OFFERS A HOST OF BENEFITS INCLUDING:

- Improved safety thanks to Instant Kick Detection™/Instant Loss Detection™;
- Significant savings in rig time and costs in deepwater wells;
- Less chance of damage to the well if a kick has to be circulated out as it can be detected earlier;
- The ability to drill with near-constant Bottom Hole Pressure (BHP);
- Drill with optimal circulation, reduce the number of casing strings and push them deeper;
- Reduce cost, maximise efficiency - EC-Drill® enables you to change the mud level in the riser in minutes, rather than spend valuable hours stopping drilling, circulating the old mud out, then circulating new mud in before drilling can resume;
- The system can be used in harsh weather conditions, not just benign seas, as no Rotating Control Device is required.

Drill safer, drill faster, drill more efficiently

EC-Drill® - addressing a real need.

Conventional drilling techniques, particularly in deepwater scenarios, suffer from a number of complications and limitations. Shallow overburden, over-pressured zones, depleted zones, weak zones and steep mud gradients must all be potentially handled, while Equivalent Circulating Densities (ECD) make controlling Bottom Hole Pressure (BHP) difficult.

With conventional drilling, it's a matter of installing numerous casing strings and changing the mud weight to compensate for ECD - halting the drilling process each time during this lengthy procedure. Then there are the numerous casing strings or liners that must be installed when unexpected pressures and weak zones are encountered. All in all, this is a time consuming, costly process.

It is not normally possible in deepwater wells to maintain a riser margin. If it is necessary to disconnect the riser from the well, for example because of severe weather, there is no longer enough hydrostatic pressure from the drilling mud to balance the pore pressure. As a result, the BOP must be closed and the well will gain pressure - meaning that reconnection is a far greater challenge.

That is not the case with EC-Drill®.

GREATER ACCURACY

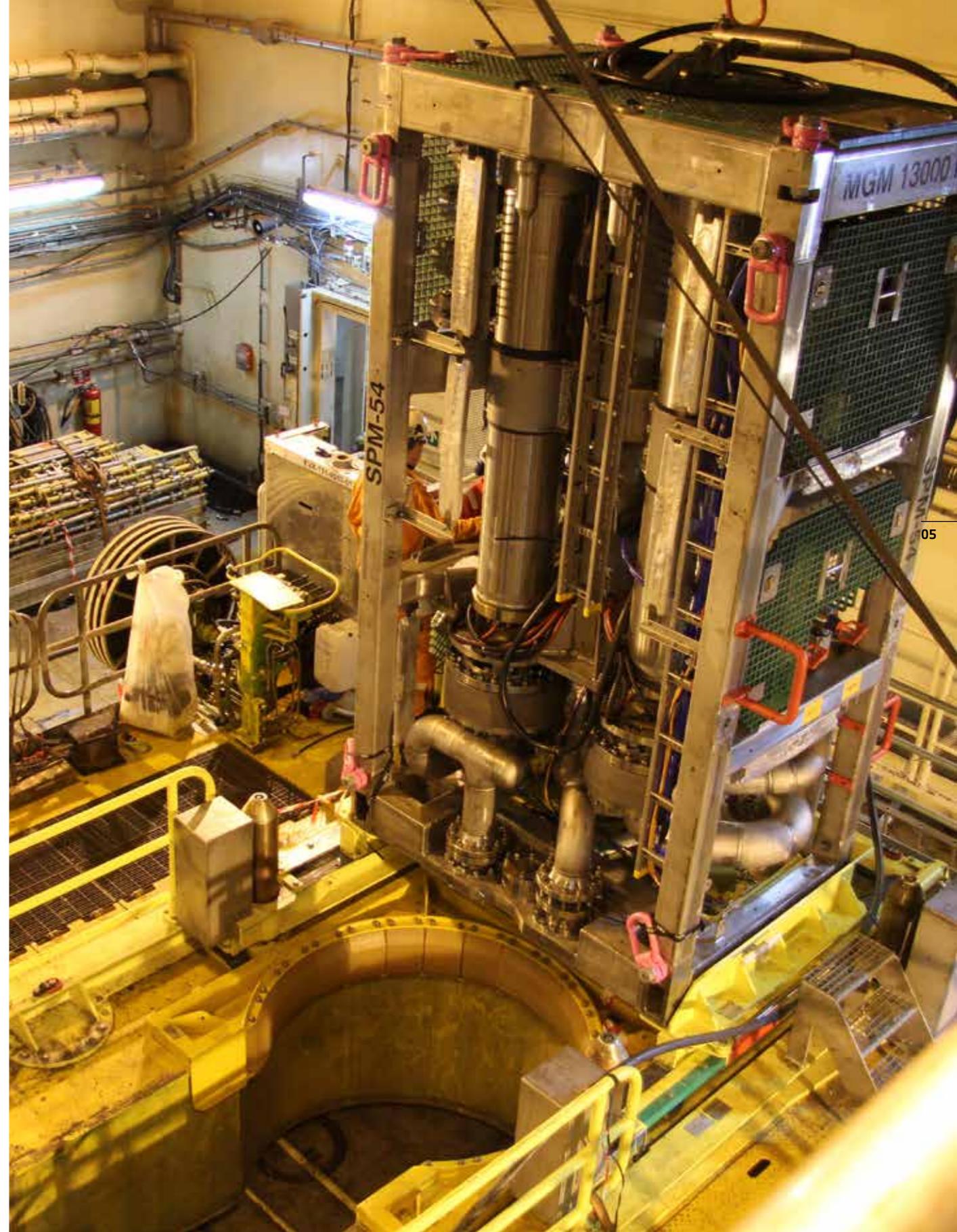
By pumping returns from the riser with EC-Drill®, it is possible to control BHP accurately using the mud level in the riser. The EC-Drill™ unit itself docks directly onto the riser but acts as a totally independent unit. If there is the need to switch back to conventional drilling method, it is possible to do so both easily and quickly by simply isolating the EC-Drill® system.

During drilling, the EC-Drill® system greatly reduces the need to regulate mud weight. Instead, the level of the mud in the riser can be finely manipulated, allowing BHP to be maintained just above pore pressure or just below fracture pressure as required.

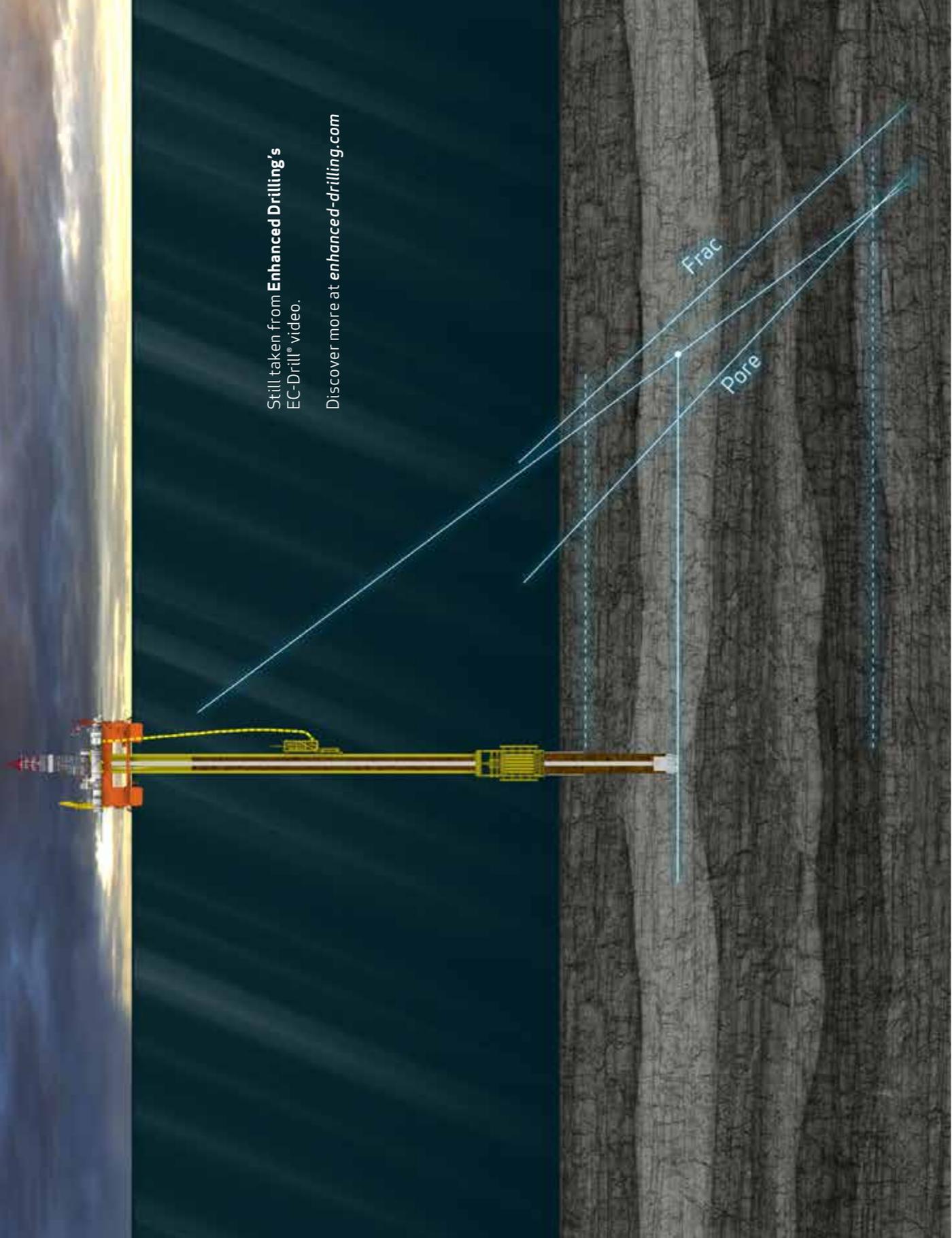
Because it is possible to drill with heavier drilling fluid with EC-Drill®, there can be enough hydrostatic pressure to establish riser margin in the event of an emergency disconnect - maintaining well integrity.

VERSATILE

The EC-Drill® system can be used in harsh weather conditions as no RCD is required.



Still taken from Enhanced Drilling's EC-Drill® video.
Discover more at enhanced-drilling.com



Improving safety by giving you information - quickly

Instant Kick Detection™ and Instant Loss Detection™

EC-Drill® from **Enhanced Drilling** embodies the very essence of our company: an innovative, technological solution that not only enhances safety but keeps your project on schedule while delivering real cost benefits.

DEAL WITH THE UNEXPECTED QUICKLY

In addition to being statically overbalanced, the EC-Drill® provides earlier kick and loss detection. This means that any potential problems can be dealt with quickly, as the system's operators have the notice needed to take any necessary action as swiftly as possible.

REDUCING THE CHANCE OF WELL DAMAGE

Any unexpected increase in the speed of the EC-Drill's® pump unit can be interpreted as a kick. The operators can limit the size of any kick thanks to the early warning, circulating it out of the system safely and preventing any damage to the well.

With conventional drilling, when it comes to deepwater, the kick can grow so large by the time any warning is received, that circulating it out is a challenging exercise - not the case with EC-Drill™.

GET BACK ON TRACK, QUICKLY

A decrease in pump speed, indicating a loss, can just as easily be dealt with. The EC-Drill's® pump speed is increased and the mud level in the riser drops, leading to a fall in BHP which is then held constant.

This stops the loss swiftly, allowing normal drilling to resume.

ADDED SAFETY

EC-Drill® offers a host of benefits to enhance your drilling projects.





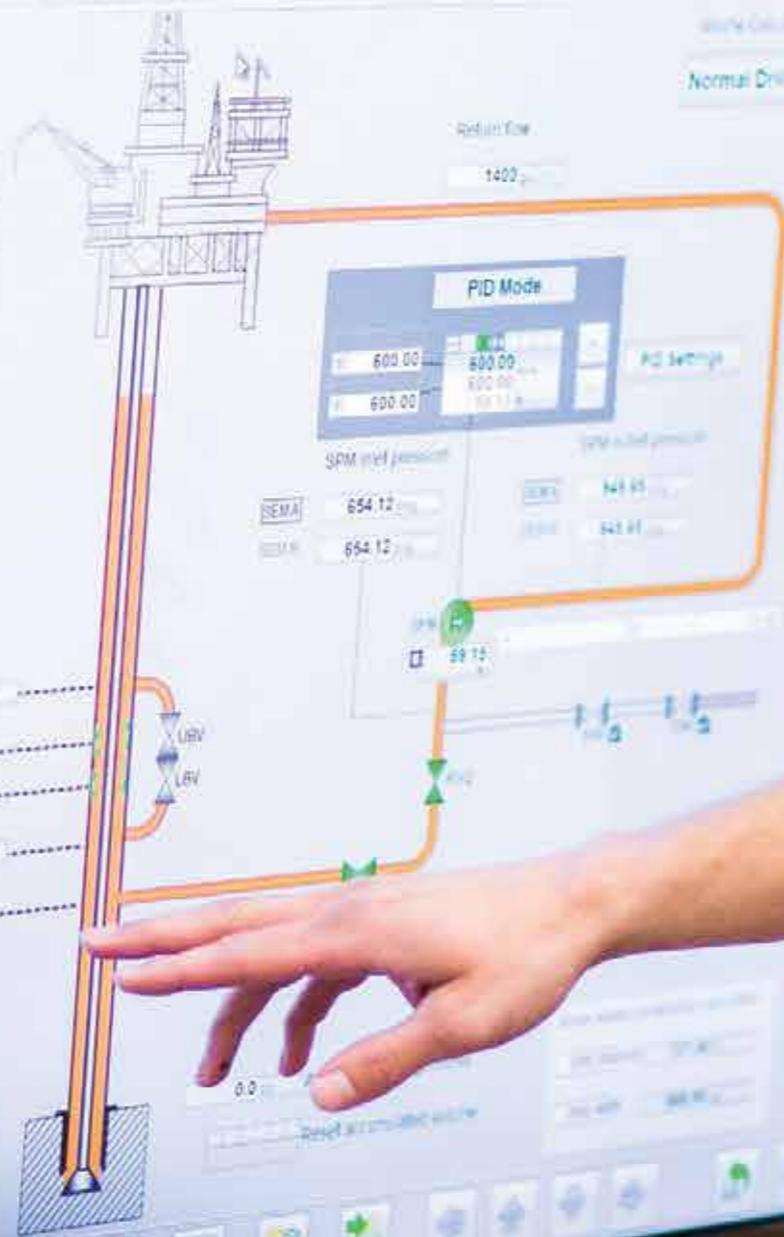
EC-Drill
Rig Data
Volume Control
Calculations

CC1-ID
Drill Log

Cause and Effect
CC2-ID
Fingerprint

Software Settings
Agreement
Ask Me
Ask Me Again

EC-Drill
Flow rate
Inlet flow
Outlet flow
Return flow
SPM inlet pressure
SPM outlet pressure



PID Mode
600.00
600.00
600.00
600.00

SEMA 654.12
SEMA 654.12

Return flow
1400

Flow rate
487.92
520.66
600.01
15.41
17060.4
17060.4
17060.4



0.0
Request all available data

A Windows taskbar at the bottom of the screen with various application icons.

Reduce casing strings, save time and money

Keep drilling for longer and drive casing strings deeper.

By drilling with heavier mud and reducing the level in the riser, the mud pressure gradient can be optimised.

This allows drilling to continue uninterrupted for longer periods in the narrow pressure window, optimising the casing program and resulting in fewer casing strings.

With conventional drilling method, once the limits of the narrow pressure window are reached drilling must stop. This is particularly problematic in deepwater.

Casing has to be then installed, new mud circulated in and only then can drilling resume within the constraints of the narrow pressure window.

WHAT EC-DRILL™ CAN DO FOR YOU:

- Enables deepwater drilling to continue uninterrupted for longer periods.
- Reduce ECD.
- Maintain a near-constant BHP.
- Improved pressure manipulation enables effective drilling of depleted reservoirs and narrow pressure windows.

- May also aid in drilling HPHT wells as BHP can be maintained just below fracture pressure.
- Flexibility: option to switch to conventional drilling at any time.

ENHANCED SAFETY

- Possible to drill with riser margin.
- Improved hole stability.
- Faster kick and loss detection.

MULTIPLE EFFICIENCY AND COST BENEFITS

- Optimise casing programme.
- Reduce number of casings.
- Minimise chances of stuck pipe.
- Operate in harsh weather; no RCD required.
- Reduction in reservoir skin damage.



- Faster kick/loss indication
- Drive casing strings deeper
- Drill deepwater with riser margin





**ENHANCED
DRILLING**



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enhanced-drilling.com