

## Real Time Operations Management

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# Overview

# ALASKA EXPLORATION

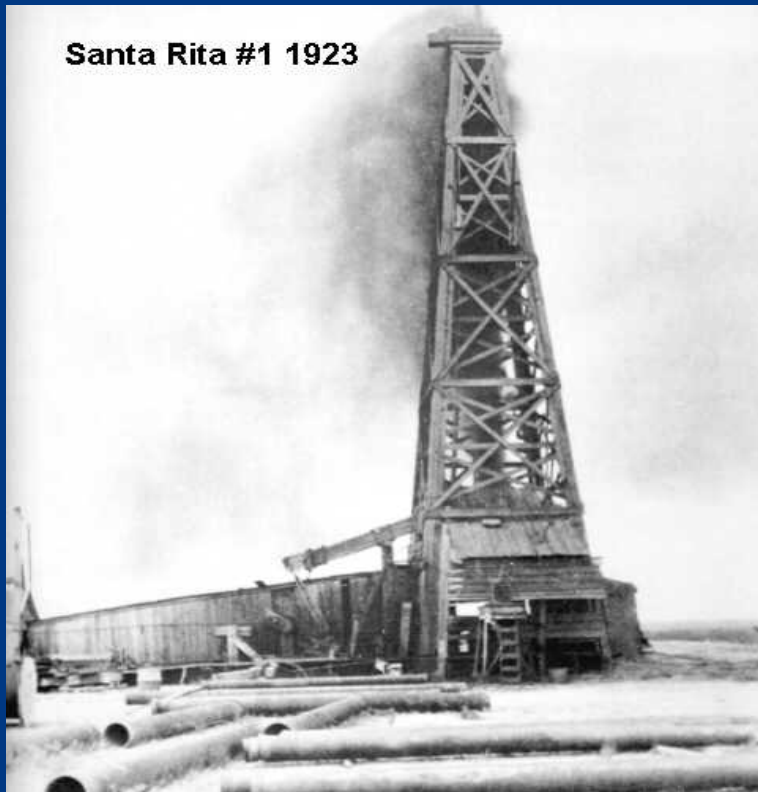
## Real Time Operations Centers (

- What they are
- How they work
- Where they help



# Drilling in the Past & Public Perception

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- Familiar images of historical drilling problems
- Depiction in film like “Black Gold”, “Hellfighters”, “Armageddon” and “There Will be Blood”

*Noble Clyde Boudreaux*



# Drilling Today

Drilling today is a very sophisticated, high-tech business with a low tolerance for risks

*Frontier Discoverer*



# The Case for RTOC's

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### Operational Excellence

- Increased HSE focus
- Access to experts around the globe
- Operations in challenging environments

### Being more pro-active / less reactive

Drilling the Right Well Right

### Enable collaboration between disciplines

G&G, Reservoir Engineering, Petrophysics, Production Technology, Wells

### Utilize improvement in IT communications technology

- Improved IT comms, downhole sensors, state-of-the-art subsurface visualization



# RTOC Evolution

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## Small-Scale Pilot Phase (2002)

- “war room” covering a limited number of exploration wells from 2002 onwards

## Maturation / Scale-Up Phase (2003 - 2005)

- Larger scale facility with ~20 staff to cover 15 concurrent rig operations
- Covering all GOM drilling & completion operations, as well as global “big cat” wells from 2003 onwards

## Global Deployment Phase (2005+)

- Build-out of additional hubs and satellites to satisfy regional / local demand



- Hub: full support capability
- Satellite: networking capability for teams

# RTOC Objectives

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## Drilling the Right Well

- Planning
- Multi-disciplinary collaboration
- 3-D subsurface & well visualization
- Offset well analysis
- Detailed well engineering modeling
- Lessons learned / best practices
- Involvement of global experts

## Drilling the Well Right

- Execution
- 24/7 monitoring, trend analysis, actual vs plan comparisons
- Delivering high-quality annotated data to decision-makers worldwide
- Capturing / disseminating learnings
- Performance analysis & benchmarking

# Global RTOC Deployment

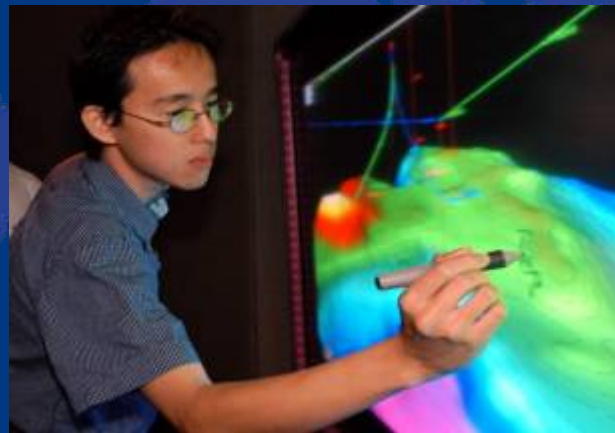
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# How RTOC Delivers Value

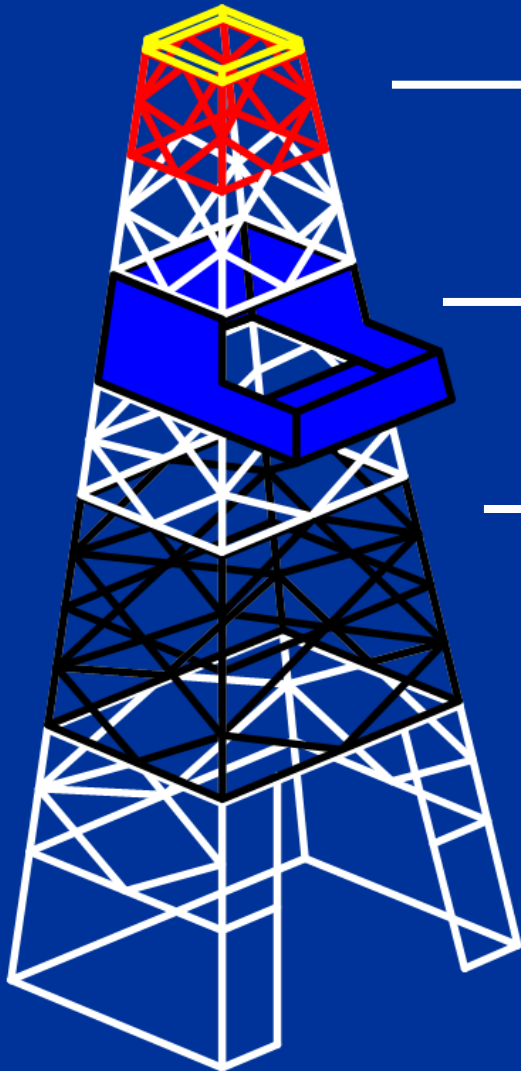
## ALASKA EXPLORATION

- Delivering better business decisions through
- the right information, at the right time, to the right people, which
- have access to global expertise in order to adopt consistent
- best practices and optimized processes
- “Everyone can be a RTOC satellite”



# Well Control

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• Relief Well Operations & Spill Response, Contingency plans in place

Layer III – Mechanical Barriers

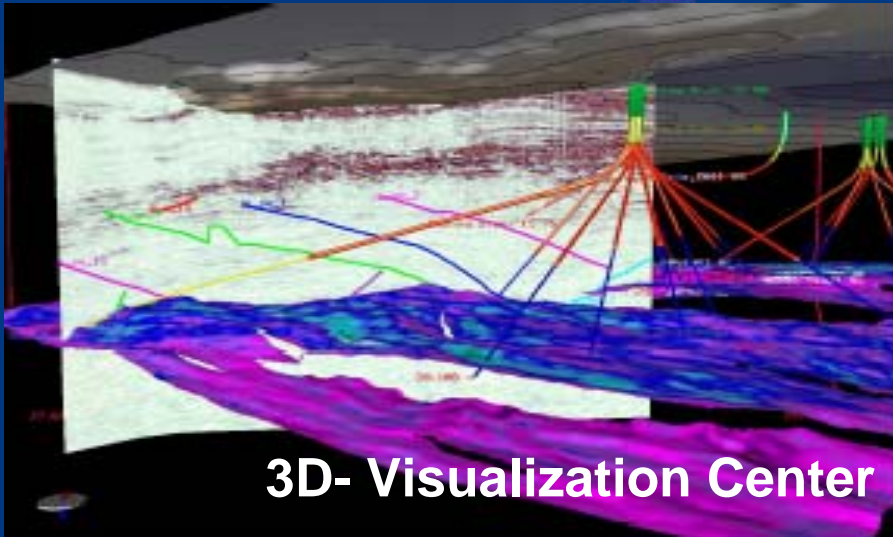
Layer II – Drilling Fluid, Early Detection, & Response  
Continuous Monitoring using RTOC

• Layer I – Planning, Training, Design, & Preparation  
Build a strong foundation

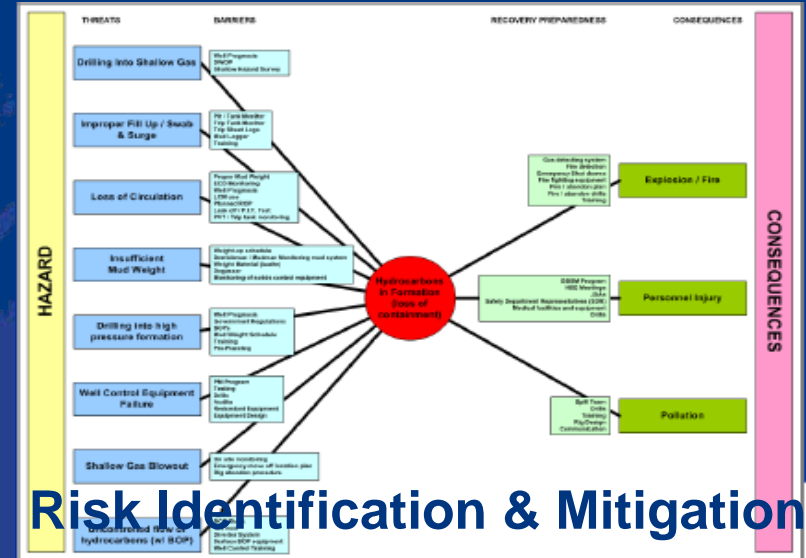
*Layers of Protection*

# Layer 1 - Planning, Training, Design, & Preparation

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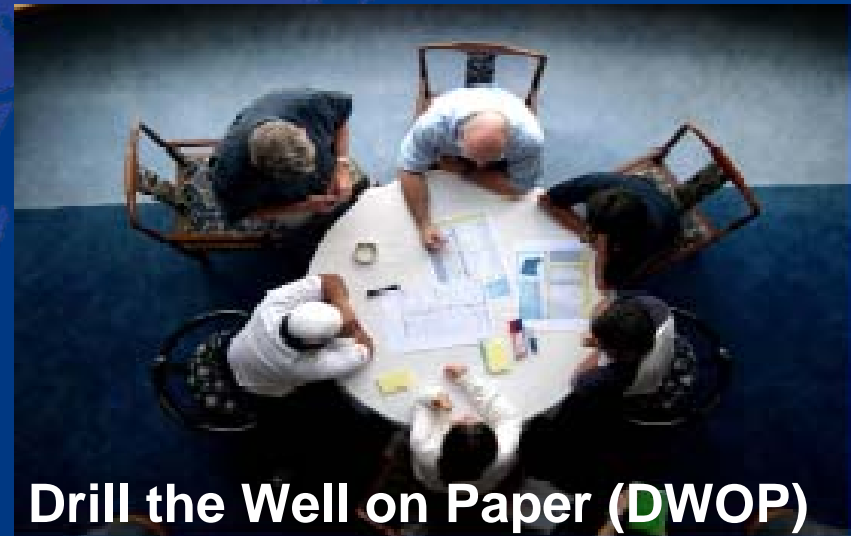
3D- Visualization Center



Risk Identification & Mitigation



Training & Certification

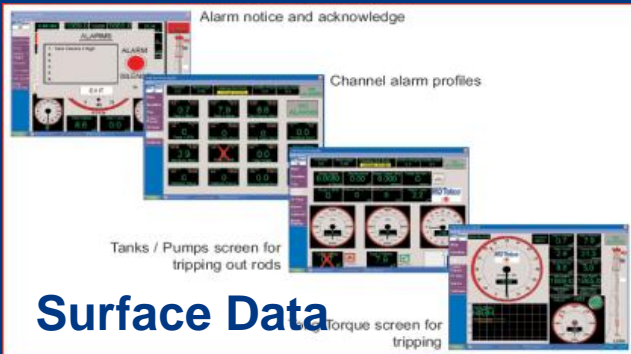


Drill the Well on Paper (DWOP)

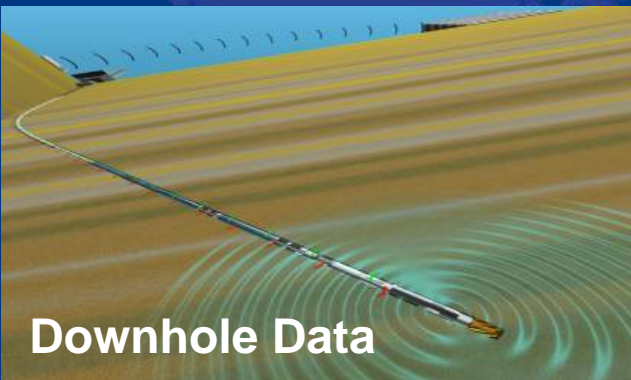


# Layer 2 – Early Detection

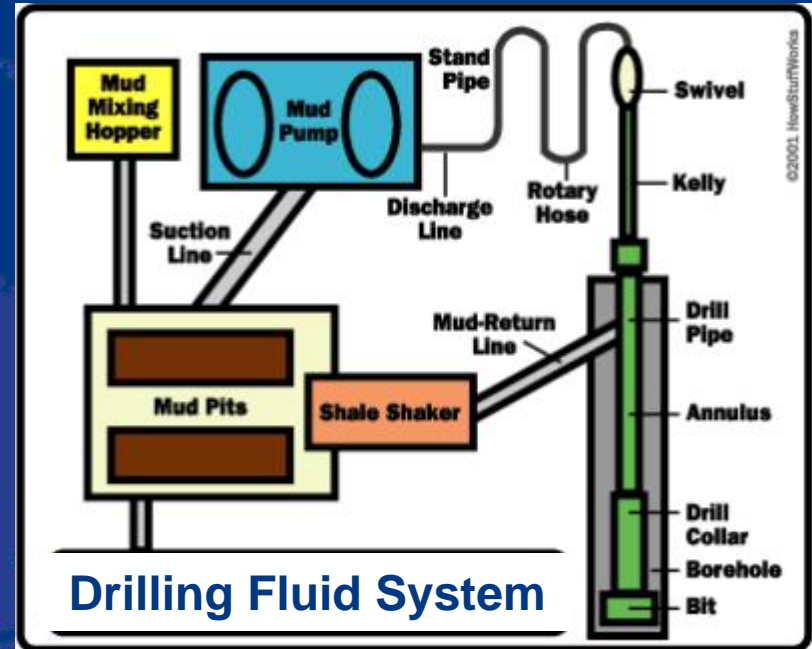
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## Surface Data



## Downhole Data



## Drilling Fluid System



Data

Advice



Data

Advice



## Real-Time Operations Centers

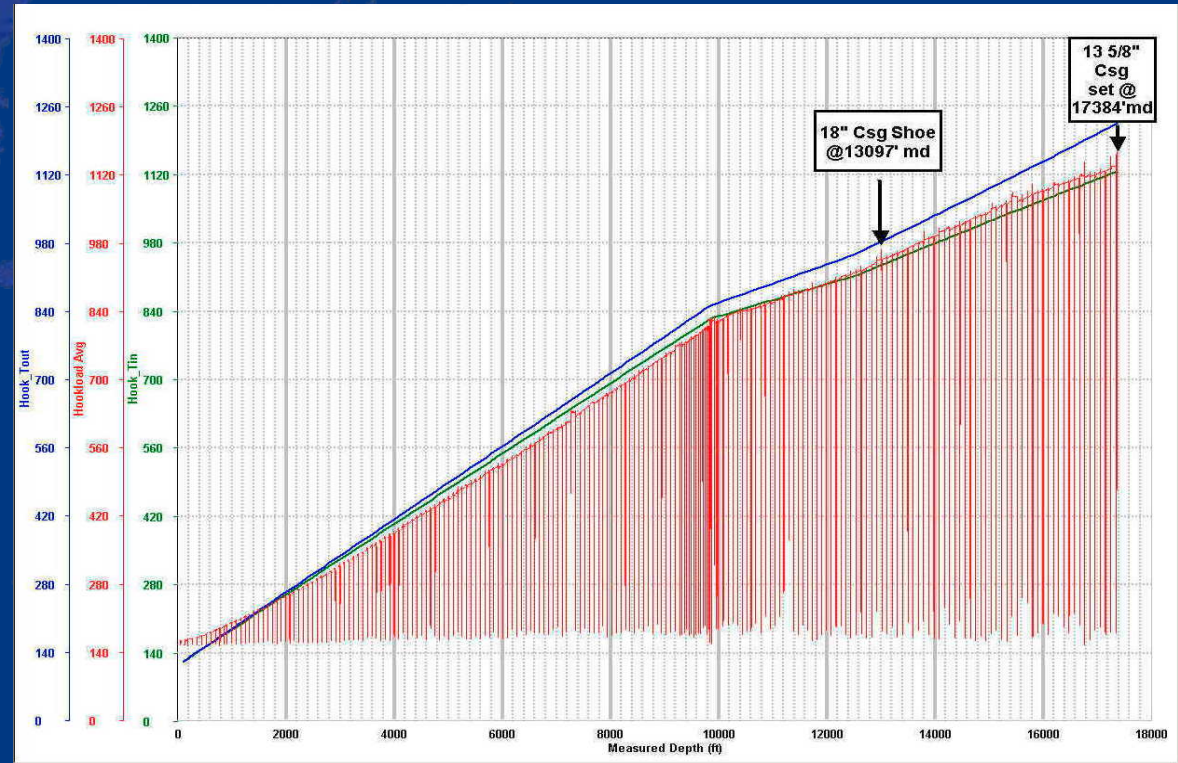
# Prevent Stuck Pipe

## What is it ?

- Detailed well engineering modelling (T&D, swab & surge, hydraulics, casing points, etc.)
- Hand-off to 24/7 monitors with real-time overlays comparing plan vs. actual

## What are the benefits ?

- Better well engineering modelling using true experts
- Highly effective in preventing non-productive-time events
- Strong buy-in from field staff, who have real-time access to all the data

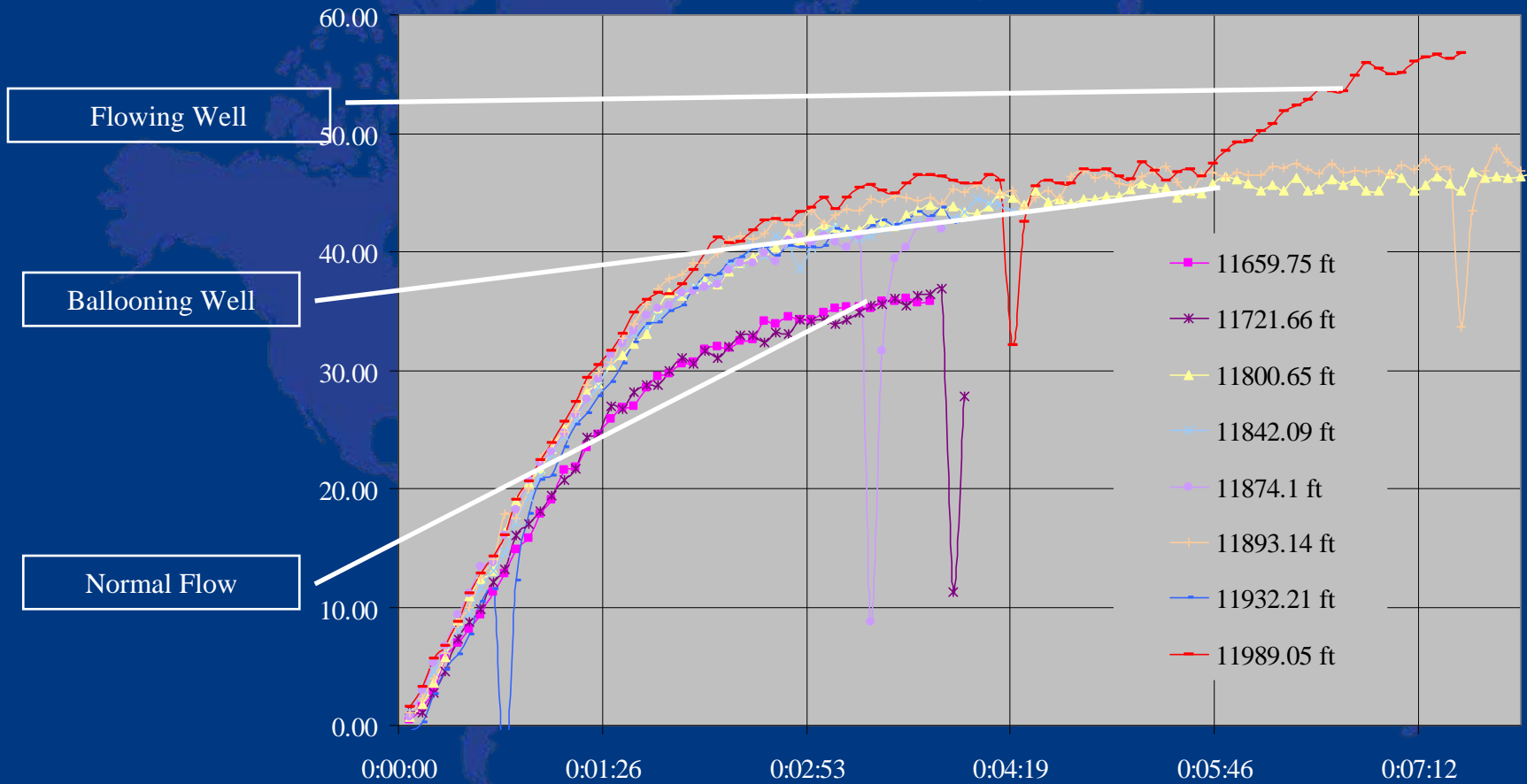


Example of a real-time hook-load plot dedicated to preventing stuck pipe during string / casing runs, with planned pick-up and slack-off curves shown with real-time data overlay



# Prevent Kicks

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# Global Leveraging

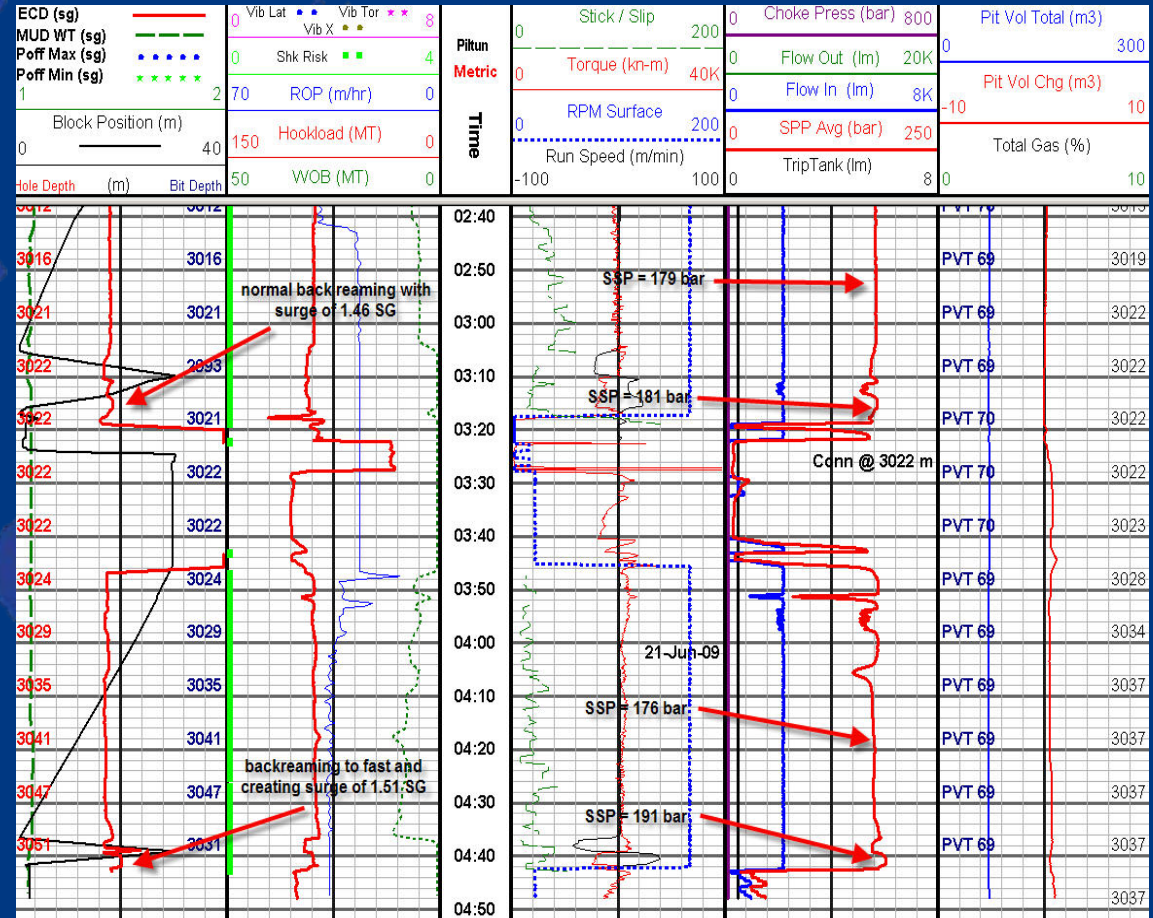
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## What is it ?

- Through RTOC, global experts can be directly involved in well planning or operations
- Quick dissemination of best practices on operations that need it most

## What are the benefits ?

- Excellent leveraging of global expertise, lateral distribution of best practices
- Quick capitalization on new learnings, acceleration of learning curves on all rigs



**Examples: Sakhalin (hole cleaning), Libya (drilling optimization), Nigeria/Kolo Creek (well control), Malaysia/Gumusut & Malikai (DW well delivery)**

THANK YOU

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