

# Realtime Downhole Data System Improves CT Operational Efficiency and Performance

Tom Watkins – ICoTA Canada Roundtable 2015



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# Agenda:

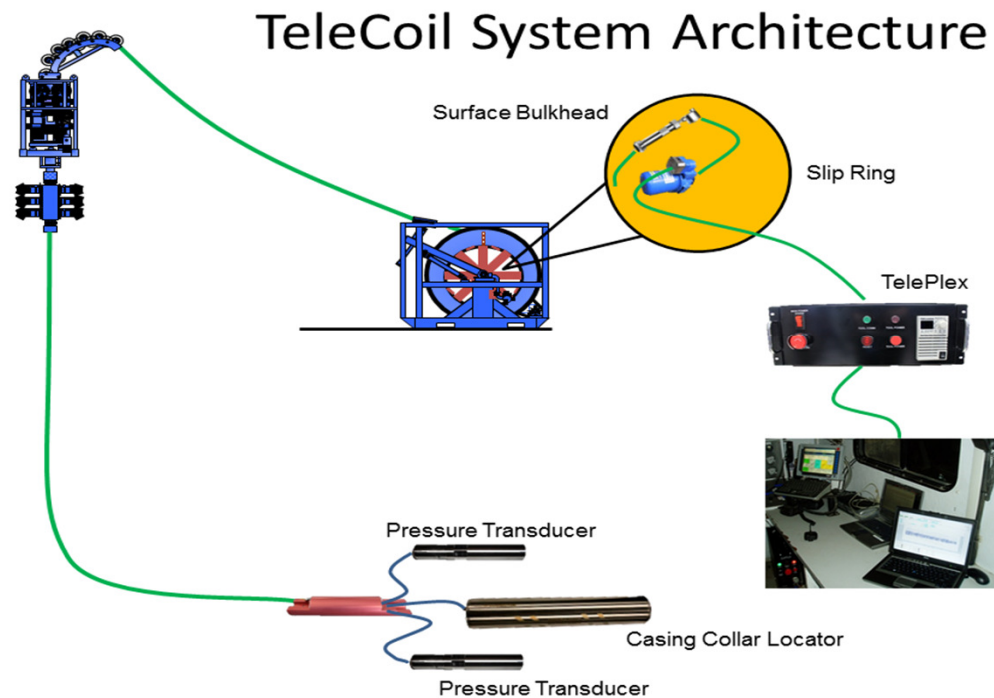
- Intro
  - Telecoil system review
    - Sizes
    - Sensors
    - Camera
    - Logging tools capability
- Case 1
- Case 2
- New developments
  - TCT
  - Acidizing BHA
- Questions

# TeleCoil™ System

- Communication system that provides real-time downhole data

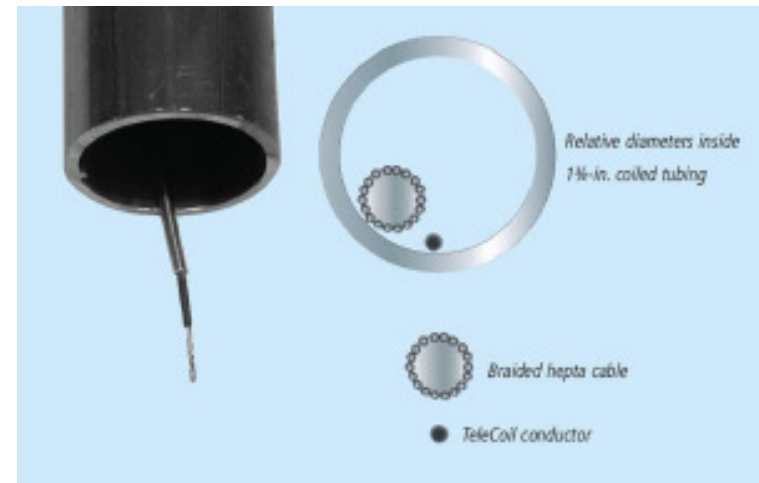
- Technology consists of three parts:

- Surface Equipment
- Wire
- Downhole tools



# TeleCoil™ Wire

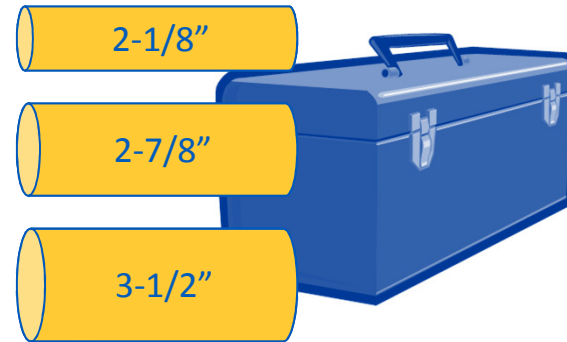
- 1/8" OD corrosion resistant alloy tube
  - Housing insulated electrical conductor
    - Non-intrusive
    - Passage of activation balls
    - Extremely quick head up (<30 minutes)
    - Compatible with oilfield fluids / slurries
    - No effect on flow rates, friction pressures
    - Minimal weight ( $\approx 1/10^{\text{th}}$  of braided cable)
    - Compatible with most single conductor cased hole wireline tools



# Downhole Tools

- Available in three sizes:

- 2-1/8" (54mm),
- 2-7/8" (73mm),
- 3-1/2" (89mm)



- Three basic types:

1. Sensor assembly (internal & external pressure/temperature, CCL)
2. Logging assembly (connection to logging tools)
3. TeleView assembly (connection to EV camera)

## 2-1/8" Tool Configurations

- Main tool is multipurpose (Headup & MHA)
- Designed for smaller completions, higher pressures

Main Tool



Logging Connection



Sensor Package



TeleView Adapter



## 2-7/8" Tool Configurations

- Original tool size for initial launch
- Designed for common intervention operations in 4-1/2" to 7" casing
- Experience has allowed it to evolve

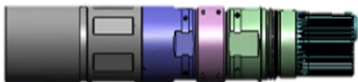
Integrated Sensor



Logging Adapter



Headup



TeleView Adapter



## Applications enhanced so far...

- Standard CT Interventions
  - Sand cleanouts
  - Scale removal
  - N2 lifting
  - Milling
  - Fishing
  - WSO
    - Setting plugs
    - Cementing
  - Shifting sleeves
  - Matrix Stimulation
- Cased Hole Logging
  - Well integrity evaluation
  - Reservoir and production evaluation
  - Downhole Imaging - Camera
- Perforating
  - Abrasive
  - TCP



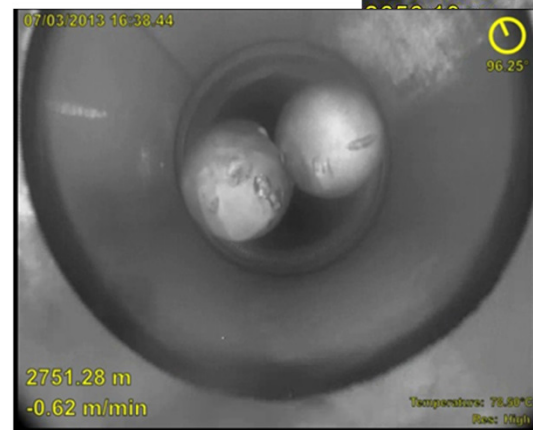
# Downhole Imaging – TeleView™

- Real time images on coil tubing
- No pumping or ball dropping constraints
- Down View Camera with front flushing sleeve
- Down View and Side View Cameras with rear flushing sleeve
- Can be combined with a Caliper
- 125°C (257°F) , 15K psi (103.4MPa)
- Well deviation, tool topside and internal temp read-out

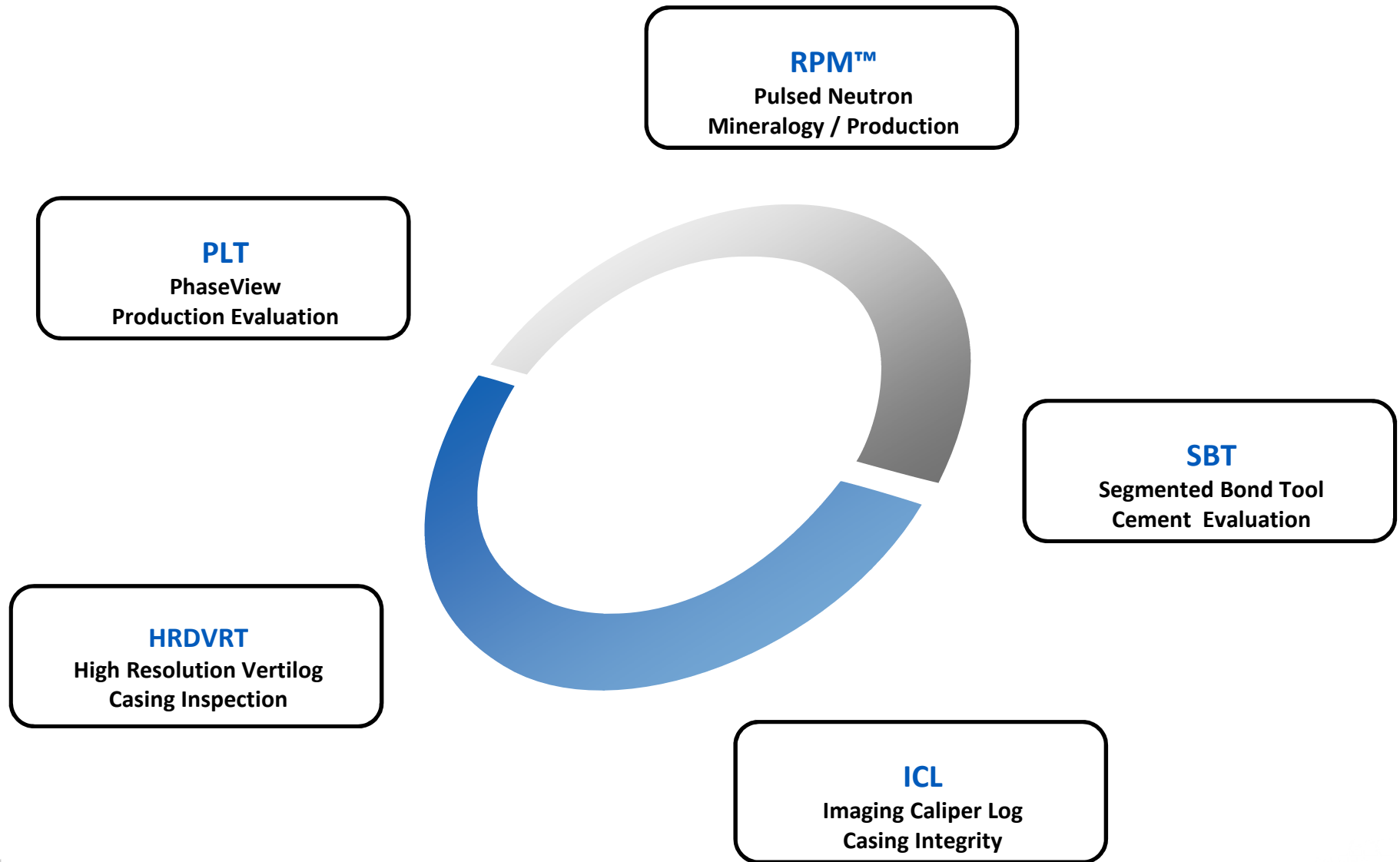


# Downhole Imaging – TeleView™

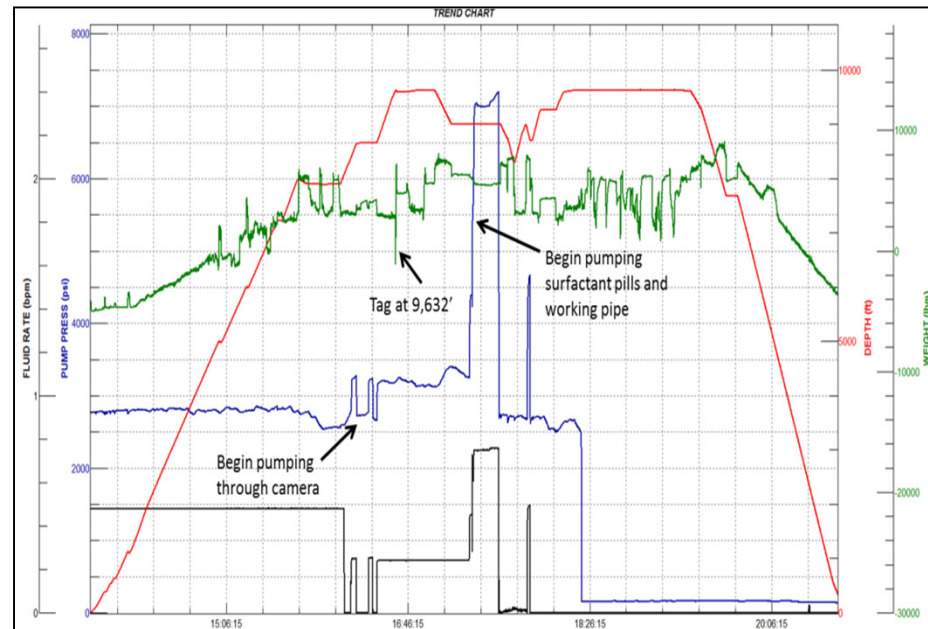
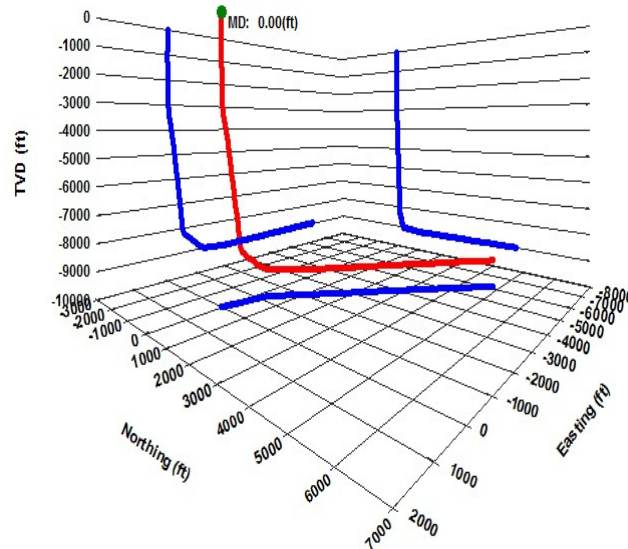
- Fishing
- Milling
- Fracturing
- Sand, Scale & Mineral Deposition
- Well Integrity
- Water Management



# Cased Hole Logging

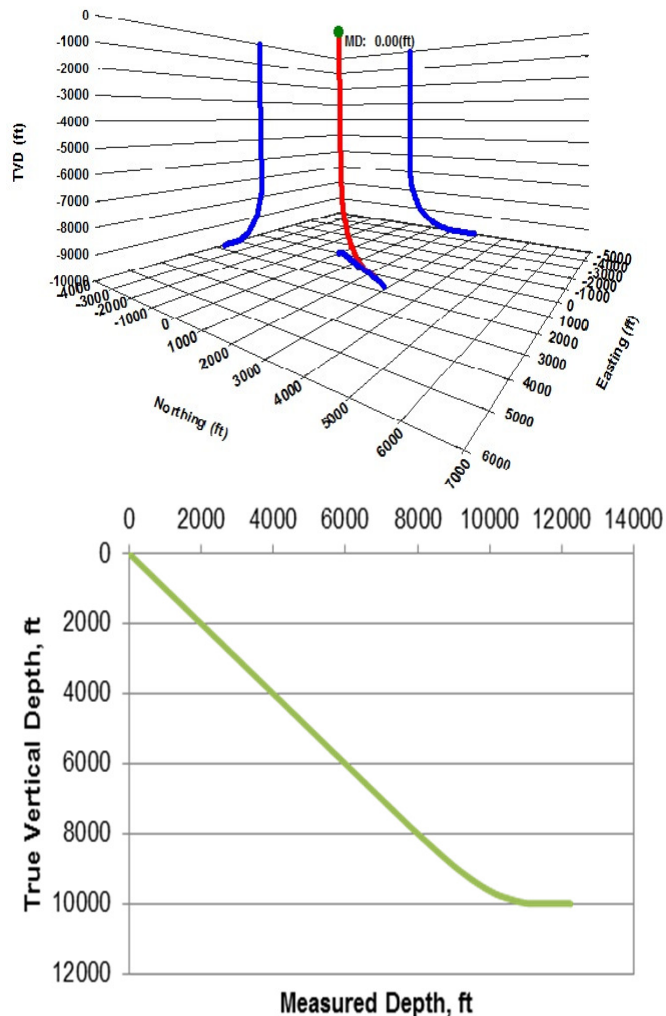


## CH1 - Conveyed Camera Operation



- Objective: identify collapsed casing during a multi-stage fracturing operation in Texas, USA
- Operational time for five unsuccessful runs with wireline, tractor, and camera was 27 hours plus 23 hours of standby
- TeleCoil conveyed camera identified the collapsed casing in 21 hours

## CH2 - Acidizing and Cleanout



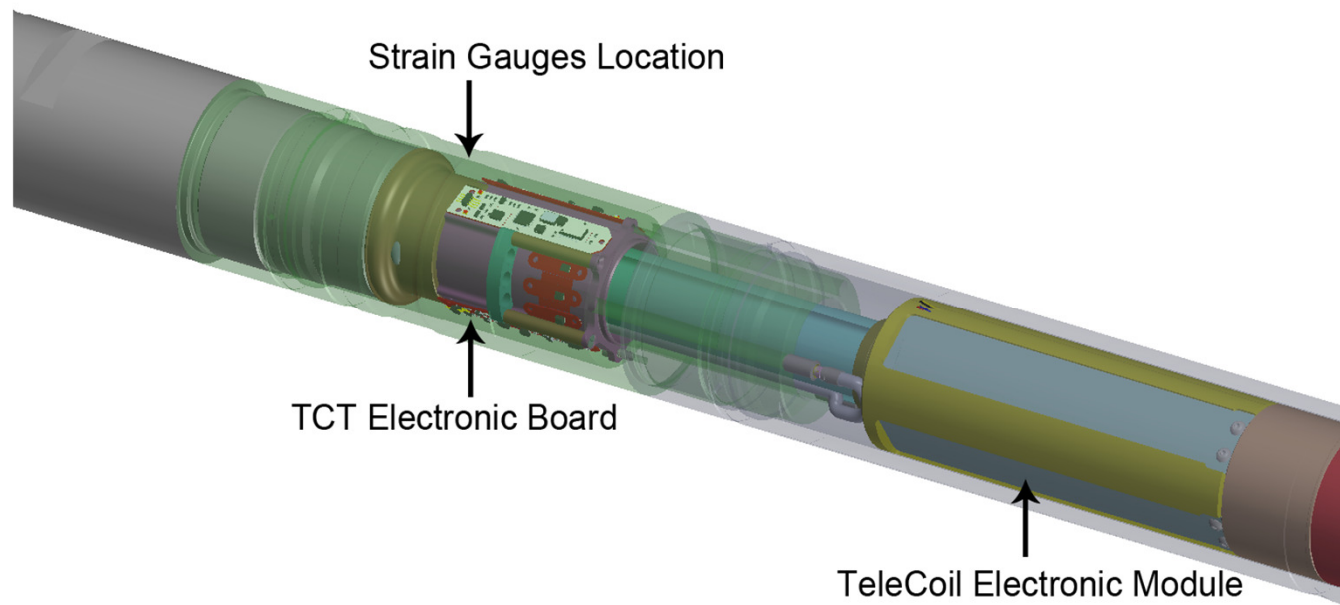
- Objective: stimulate a Brazilian deepwater well with five previous fractures
- 2 1/8-in. sensor assembly and logging adapter were installed on 1 3/4-in. CT; A rotary jetting tool was run on the sensor bha to clean the wellbore of scale/debris, immediately following the clean out run. Logging tools conveyed via CT identified the target depth of the problem areas.
- CCL data helped spot the stimulation treatment at the target depth, optimizing the acid volume and efficiency
- Pressure data helped monitor the rotary jetting tool's functionality
- Pressure and temperature data helped lower the nitrogen rate and optimize the lifting efficiency

# TeleCoil™ can be part of the entire work scope

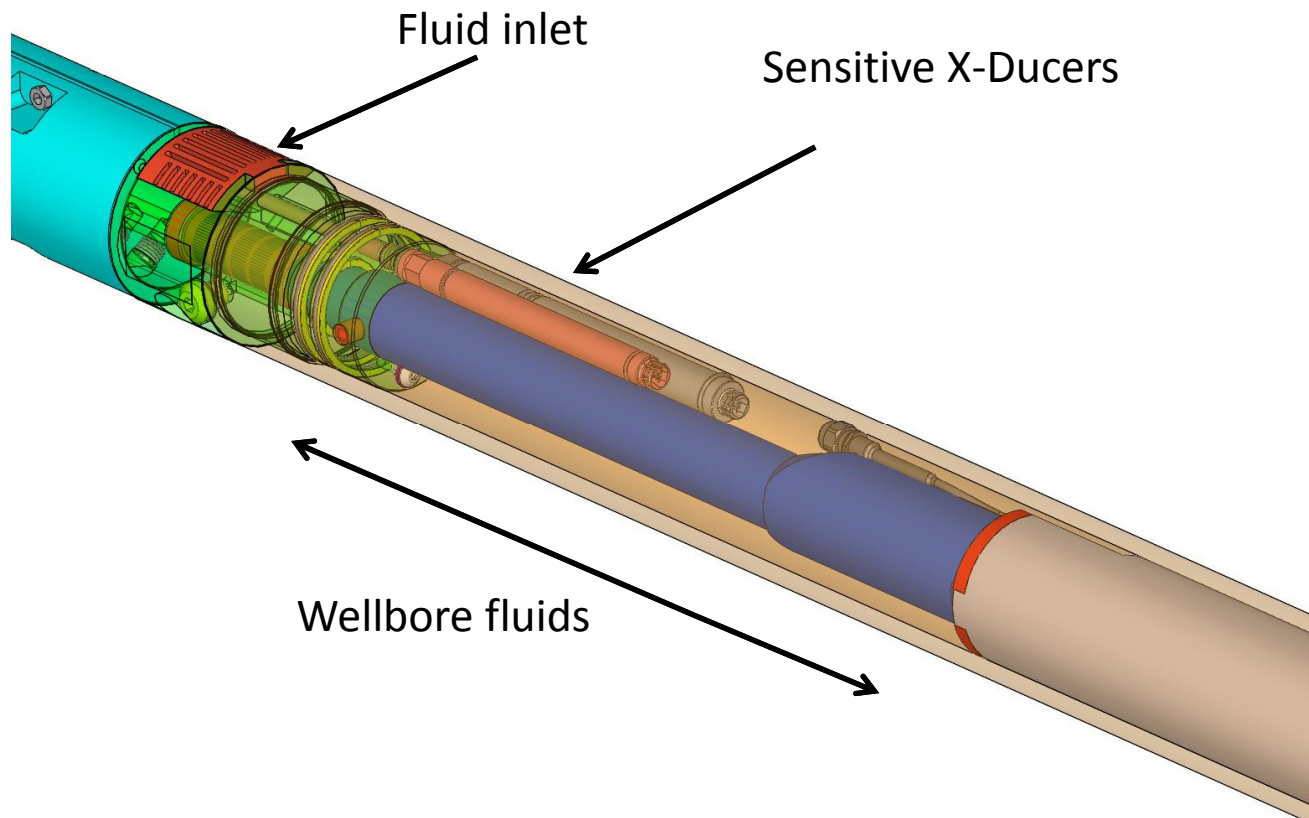
| Intervention Objective |                        | TeleCoil BHA                       |
|------------------------|------------------------|------------------------------------|
| <b>Access</b>          | Solids removal         | Sensor BHA                         |
|                        | Milling                |                                    |
|                        | Extended Reach         |                                    |
|                        | Scale removal          |                                    |
|                        | Fishing                |                                    |
| <b>Diagnose</b>        | Well Integrity         | Logging Adapter & TeleView Adapter |
|                        | Production evaluation  |                                    |
|                        | Reservoir evaluation   |                                    |
|                        | Camera                 |                                    |
| <b>Fix</b>             | Matrix Stimulation     | Sensor BHA & Logging Adapter       |
|                        | CT Frac                |                                    |
|                        | WSO/GSO                |                                    |
|                        | StimTunnel             |                                    |
|                        | Fishing                |                                    |
|                        | Perforating            |                                    |
|                        | Milling / Pipe cutting |                                    |
|                        | Isolation              |                                    |
|                        | N2 lift                |                                    |
| <b>Verify</b>          | Sames as diagnose      | Logging Adapter & TeleView Adapter |

■ “On The Horizon” :

– TCT –Tension/Compression/Torque



- Acidizing BHA –Used for efficient and accurate matrix acidizing of carbonate open-hole wells- Better than DTS!







- Questions ?

- Special thanks to:

  - SilViu Livescu –BHI

  - Diego Blanco –BHI

  - Lubos Vacik –BHI

