Serving Oil & Gas Industry

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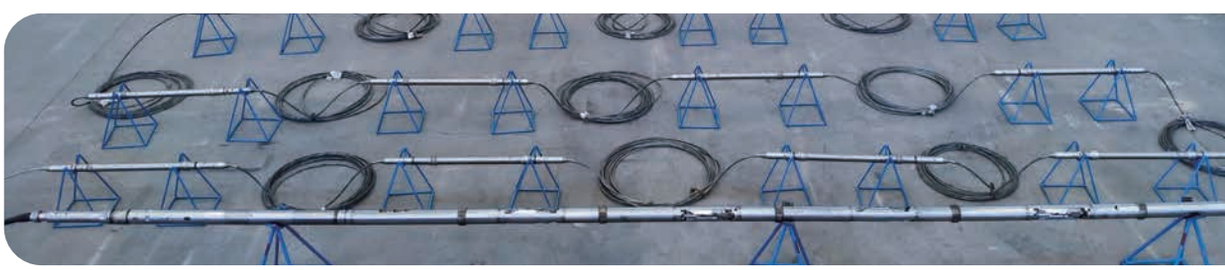

www.RenheSun.com
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Manufacturing Wireline Logging & LWD Equipment.

Providing Wireline Logging & LWD Cooperation Services.

Providing Logging Analysis & Software Development.

4S Policy: Equipment Sales Cooperation Services

Technology Supporting Component Supply

Philosophy: Preciseness, Innovation, Cooperation, Win-win!

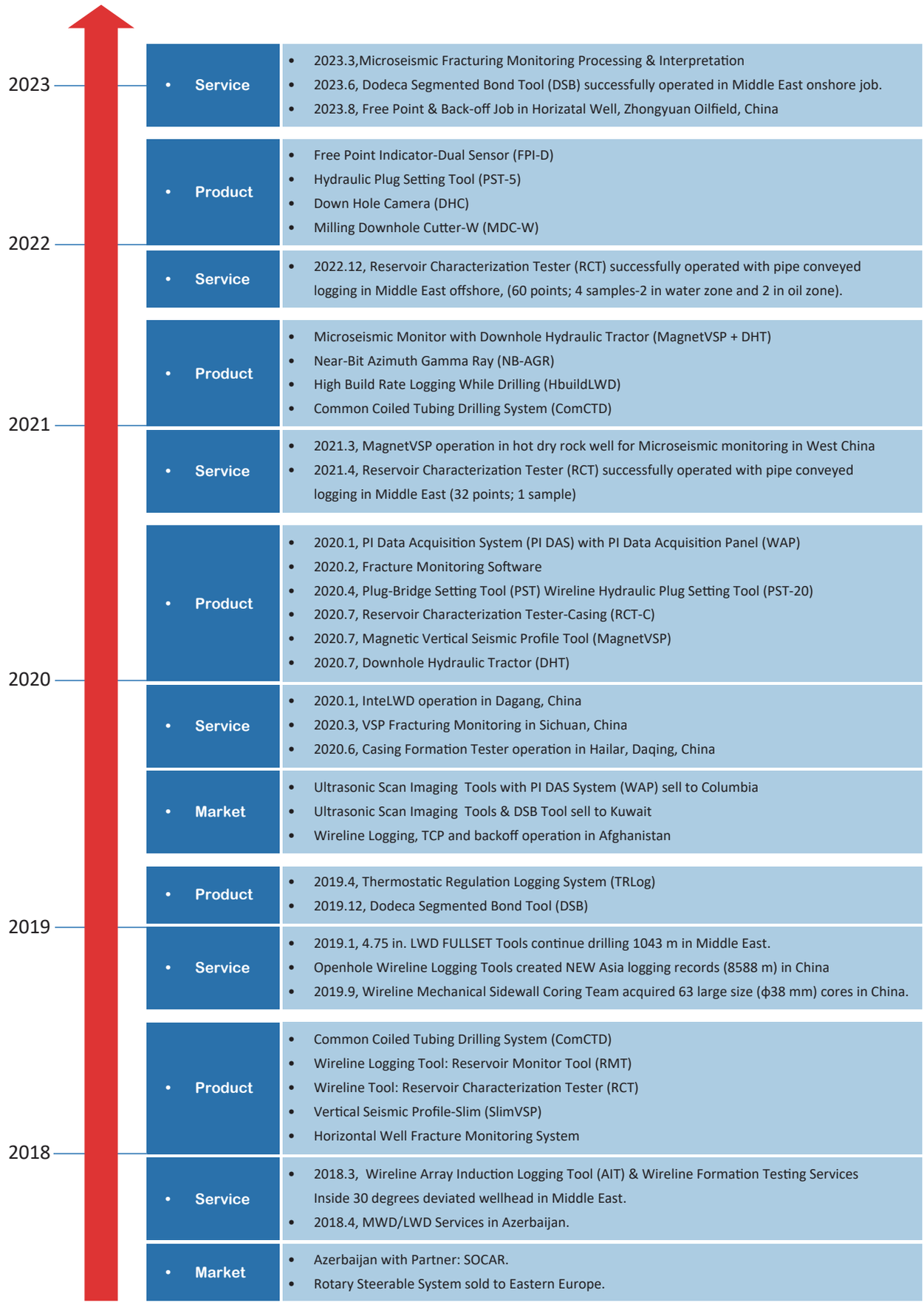
Partners:

Weatherford™

BAKER HUGHES a GE company

ANTARES

MileStone


2023
Service
2023.3,Microseismic Fracturing Monitoring Processing & Interpretation
2023.6, Dodeca Segmented Bond Tool (DSB) successfully operated in Middle East onshore job.
2023.8, Free Point & Back-off Job in Horizatal Well, Zhongyuan Oilfield, China
2022
Product
Free Point Indicator-Dual Sensor (FPI-D)
Hydraulic Plug Setting Tool (PST-5)
Down Hole Camera (DHC)
Milling Downhole Cutter-W (MDC-W)
Service
2022.12, Reservoir Characterization Tester (RCT) successfully operated with pipe conveyed logging in Middle East offshore, (60 points; 4 samples-2 in water zone and 2 in oil zone).
2021
Product
Microseismic Monitor with Downhole Hydraulic Tractor (MagnetVSP + DHT)
Near-Bit Azimuth Gamma Ray (NB-AGR)
High Build Rate Logging While Drilling (HbuildLWD)
Common Coiled Tubing Drilling System (ComCTD)
Service
2021.3, MagnetVSP operation in hot dry rock well for Microseismic monitoring in West China
2021.4, Reservoir Characterization Tester (RCT) successfully operated with pipe conveyed logging in Middle East (32 points; 1 sample)
2020
Product
2020.1, PI Data Acquisition System (PI DAS) with PI Data Acquisition Panel (WAP)
2020.2, Fracture Monitoring Software
2020.4, Plug-Bridge Setting Tool (PST) Wireline Hydraulic Plug Setting Tool (PST-20)
2020.7, Reservoir Characterization Tester-Casing (RCT-C)
2020.7, Magnetic Vertical Seismic Profile Tool (MagnetVSP)
2020.7, Downhole Hydraulic Tractor (DHT)
Service
2020.1, InteLWD operation in Dagang, China
2020.3, VSP Fracturing Monitoring in Sichuan, China
2020.6, Casing Formation Tester operation in Hailar, Daqing, China
Market
Ultrasonic Scan Imaging Tools with PI DAS System (WAP) sell to Columbia
Ultrasonic Scan Imaging Tools & DSB Tool sell to Kuwait
Wireline Logging, TCP and backoff operation in Afghanistan
2019
Product
2019.4, Thermostatic Regulation Logging System (TRLog)
2019.12, Dodeca Segmented Bond Tool (DSB)
Service
2019.1, 4.75 in. LWD FULLSET Tools continue drilling 1043 m in Middle East.
Openhole Wireline Logging Tools created NEW Asia logging records (8588 m) in China
2019.9, Wireline Mechanical Sidewall Coring Team acquired 63 large size (ϕ38 mm) cores in China.
2018
Product
Common Coiled Tubing Drilling System (ComCTD)
Wireline Logging Tool: Reservoir Monitor Tool (RMT)
Wireline Tool: Reservoir Characterization Tester (RCT)
Vertical Seismic Profile-Slim (SlimVSP)
Horizontal Well Fracture Monitoring System
Service
2018.3, Wireline Array Induction Logging Tool (AIT) & Wireline Formation Testing Services Inside 30 degrees deviated wellhead in Middle East.
2018.4, MWD/LWD Services in Azerbaijan.
Market
Azerbaijan with Partner: SOCAR.
Rotary Steerable System sold to Eastern Europe.

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2017	• Product	• 6.75 in. Rotary Steerable Unit (RSU-6) • Formation Coring Tool-Large (FCT-L) (Sample Size: Φ38 mm) • 3.375 in. MWD/LWD Tools (MWD, IGR, EPR) • InteLWD System • Pressure & Caliper Measurement While Drilling (PCD) & Near-Bit Azimuth Gamma Ray (NB-AGR)
	• Service	• 2017.3, 4.75 in. ComLWD (MWD, IGR, EPR, CCN-4, RAD-4) in Middle East. • 2017.4, 6.75 in. ComLWD (MWD, IGR, EPR, CCN-6, RAD-6) in Middle East. • 2017.4, Logging While Fishing (LWF) in Middle East. • 2017.4, Wireline Logging Services (Including: Ultrasonic Scan Imaging Tool-V & Hexapod Resistivity Imaging Tool) inside a 4340 m depth well with 70 degrees by PCL in Middle East. • 2017.5, Wireline Ultrasonic Scan Imaging Logging Tool-V (USI-V) services inside 5 in. horizontal cased hole in Middle East. (ID: 4.275 in.) • 2017.7, Fullset Wireline Logging Services on offshore Rig by back to the wellhead accomplish operation.
	• Market	• Downhole Camera (DHC) sold to Algeria.
2016	• Product	• Fullset Wireline Logging Tools: ComboLog System • LWD: 4.75 in. Rotary Azimuthal Density (RAD-4), Caliper Corrected Neutron Porosity (CCN-4)
	• Service	• 2016.1, Wireline Logging Tools created Asia Records (8418 m) in Sichuan, China. • 2016.8, Fullset Wireline Logging, including: Multi-dipole Array Acoustic Tool (MAA), Hexapod Resistivity Imaging Tool (RIT-WBM), Ultrasonic Scan Imaging Tool-V (USI-V/USI-F), Nuclear Magnetic Resonance Tool (NMR-M), Vertical Seismic Profile Tool (VSP), and etc. • 2016.9, MWD/LWD Services (MWD, IGR, EPR) continuous working 555 hours in Middle East. • 2016.10, 9-5/8 in. Casing Corrosion Inspection by Ultrasonic Scan Imaging Tool-V (USI-V/USI-F) in Middle East.
	• Market	• Tools sold to Germany.
2015	• Product	• LWD: 6.75 in. Rotary Azimuthal Density (RAD-6) & Caliper Corrected Neutron Porosity (CCN-6) • Fullset Wireline Logging Tools: HostileLog System • Geophysics Vertical Seismic Profile Tool (GeoVSP) • Multilevel Vertical Seismic Profile Tool (MultiVSP) • Piezoelectric Vertical Seismic Profile Tool (PiezoVSP) for Hostile Enviorment
	• Service	• 2015.5, Seismic Services in Gansu, Zero-offset. (GeoVSP) • 2015.8, MWD/LWD Services in Eastern Europe. • 2015.10, Seismic Services for Fracturing Monitoring in Hebei, China. (MultiVSP) • 2015.11, Wireline Ultrasonic Scan Imaging (USI-V/USI-F) Services inside Horizontal Well in Middle East • 2015.12, Zero-offset Services in Xinjiang, China. (PiezoVSP)
	• Base	• Setup wireline Cased hole and Open hole testing well in Middle East base. • Setup MWD/LWD Radioactive Calibration Environment in Middle East Base.
2014	• Product	• Wireline Tool: Gyroscope Orientation Tool-Continuous (GOT-C)
	• Service	• 2014.1, Wireline Formation Testing Services by TLC method in Middle East. (57 Points) Downhole Casing & Tubing Tractor (CTT) Services in Eastern Europe.
	• Market	• 85 Toolstrings of MWD/LWD Tools sold to South America
	• Base	• Setup Eastern Europe Base for Wireline & MWD/LWD Services.
2013	• Product	• ComLWD System (4.75 in., 6.75 in. & 8.25 in.) • Wireline Formation Tester (FFP-FT) • Wireline Logging Tool: Hexapod Resistivity Imaging Tool (RIT-OBM) • Pipe Conveyed Logging Tool (PCL-H & PCL-B)

MileStone

2013	• Service	• 2013.8, Fullset Wireline Logging Services in Middle East. • 2013.9, Wireline Formation Testing Services in Azerbaijan. • 2013.11, 4.75 in. MWD/LWD continuous working 425 hours in Middle East. • 2013.12, Downhole Casing & Tubing Tractor (CTT) moved 870 m inside a 6002 m depth well with 92 degrees deviation in Xinjiang, China.
	• Base	• Setup service base for LWD & Wireline Logging Services in Middle East. • Setup Beijing Wireline Logging Radioactive Calibration Wells & OBM Resistivity Imaging Test Pit. • Setup Beijing MWD/LWD Calibration & Maintenance Base.
2012	• Product	• Wireline Logging Tool: Nuclear Magnetic Resonance Tool (NMR-M) • LWD: Electromagnetic Propagation Resistivity (EPR)
	• Market	• Fullset Wireline Logging Tools sold to Middle East.
	• Base	• Setup Beijing MWD/LWD Mud Circulation & Calibration Environment.
2011	• Product	• Wireline Logging Tool: Ultrasonic Scan Imaging Tool-V (USI-V/USI-F)
	• Service	• Long-term Sidewall Coring Services Cooperation with Weatherford worldwide .
	• Base	• Setup Beijing Test Pit, including: Openhole, Casing Hole, Horizontal Casing Hole. • Setup Beijing Reliability Testing Environment, including: HPHT Testing Hole, Pressure Hole, Vibration/Impact Testing Platform, Heating & Humidification Testing Environments, and etc.
2010	• Product	• Wireline Tools: Ultrasonic Scan Imaging Tool (USI), Hexapod Resistivity Imaging Tool (RIT-X), Downhole Casing & Tubing Tractor (CTT), Free Point Indicator (FPI), Hexapod Segmented Bond Tool (HSB), and etc.
	• Market	• Fullset Wireline Logging Tools (Including Imaging Logging Tools) sold to Kuwait. • Wireline Tools (Including: Sidewall Coring Tool, Resistivity Imaging Logging Tool, Ultrasonic Scan Imaging Tool, Multi-dipole Array Acoustic Tool) sold to Iraq. • Interpretation Software (PIVIEW) sold to Oman.
2009	• Product	• Wireline Logging Tool: Array Induction Tool (AIT) • Wireline Logging Tool: Hexapod Resistivity Imaging Tool (RIT-WBM)
	• Service	• 86 Wells Sidewall Coring Services in Mongolia.
	• Market	• Fullset Wireline Logging Tools (Including Resistivity Imaging Logging Tool) to Middle East.
2008	• Product	• Wireline Logging Tool: Surface Data Acquisition System (PI DAS)
2007	• Product	• Wireline Logging Tool: Multi-dipole Array Acoustic Tool (MAA)
2006	• Product	• Wireline Logging Tools: RTS, ORT, DST, CNT, ACT, DLT, MSF and etc. • Wireline Logging Tool: Hexapod Diplog Tool (HDT)
	• Service	• NMR Rock Sample Analysis for SINOPEC (Shengli Oilfield). • Offshore Wireline Sidewall Coring Services for LCC (Baker Atlas & CNOOC Joint Venture).
2005	• Product	• Wireline Logging Tool: Litho-Density Logging Tool (ZDT)
	• Service	• Wireline Sidewall Coring Services in CNPC (Daqing Oilfield & Karamay Oilfield) & SINOPEC (Shengli Oilfield).
2004	• Buildup	• Established in Beijing.

Services (Equipment) Ability

MWD/LWD Services

ComLWD

Wireless Measurement While Drilling (MWD)

Azimuthal Resistivity Drilling (ARD)

Electromagnetic Propagation Resistivity (EPR)

Inclination and Gamma Ray (IGR)

Near-Bit Azimuth Gamma Ray (NB-AGR)

Caliper Corrected Neutron Porosity (CCN)

Rotary Azimuthal Density (RAD)

Acoustic While Drilling (AWD)

Pressure Unit While Drilling (PWD)

Pressure & Caliper Measurement While Drilling (PCD)

InteLWD

Integrated Logging While Drilling System (InteLWD)

Bi-directional Communication Power Module (BCP-O)

Logging While Drilling-O (LWD-O)

Rotary Steerable Unit (RSU)

Near-Bit Azimuth Gamma Ray (NB-AGR)

Caliper Corrected Neutron Porosity (CCN)

Rotary Azimuthal Density (RAD)

Azimuthal Resistivity Drilling (ARD)

Pressure & Caliper Measurement While Drilling (PCD)

Ultrasonic Caliper Measurement While Drilling (CWD)

HostileLWD

Bi-directional Communication Power Module-Hostile (BCP-H)

Pressure & Caliper Measurement While Drilling (PCD)

Electromagnetic Propagation Resistivity-B (EPR-B)

Wireless Measurement While Drilling-B (MWD-B)

HbuildLWD

High Build Rate Rotary Steerable Unit (RSU-B)

Wireless Measurement While Drilling (MWD-B)

Electromagnetic Propagation Resistivity-B (EPR-B)

Azimuth Electronic Magnetic Resistivity While Drilling (ARD)

Bi-directional Communication Power Module-B (BCP-B)

Pressure & Caliper Measurement While Drilling (PCD/PWD)

Acoustic While Drilling (AWD)

Nuclear Magnetic Resonance Imaging While Drilling (MRI)

Formation Tester While Drilling (FTD)

GeoLWD

Near-Bit Azimuth Gamma Ray (NB-AGR)

Pressure & Caliper Measurement While Drilling (PCD)

Ultrasonic Caliper Measurement While Drilling (CWD)

Gyroscope Measurement While Drilling (GyroMWD)

Generator Caliper Corrected Neutron Porosity (GCN)

LithoLWD

Caliper Corrected Neutron Porosity (CCN)

Rotary Azimuthal Density (RAD)

Generator Caliper Corrected Neutron Porosity (GCN)

Nuclear Magnetic Resonance Imaging While Drilling (MRI)

Acoustic While Drilling (AWD)

Formation Tester While Drilling (FTD)

PIDAS

PI Data Acquisition System (PIDAS) (WL/LWD)

Bi-directional Communication System (BCP/BPC/NPG)

Remote Data Telemetry (RDT)

GeoSteering While Drilling (GSD)

Services (Equipment) Ability

Openhole WL Services

Combo Logging with AIT & ALT (ComboLog)
Hostile Logging (HostileLog)
Lithology Logging System (LithoLog)
Thru-Pipe Logging System (ThruLog)
High Temperature & Pressure Logging System (HTPLog)
Thermostatic Regulation Logging System (TRLog)
Nuclear Magnetic Resonance Log (NMR-M)
Multipole Array Acoustic Log (MAA)
Deep-Survey Multipole Array Acoustic Tool (MAA-D)
Hexapod Resistivity Imaging Log-WBM (RIT-WBM)
Hexapod Resistivity Imaging Log-OBM (RIT-OBM)
Slim Hexapod Resistivity Imaging Log-WBM (SRI-WBM)
Slim Hexapod Resistivity Imaging Log-OBM (SRI-OBM)
Ultrasonic Scan Imaging Log (USI)
Thin Layer Resistivity Log (TLR)
Elemental Capture Log (ECT)

Wireline Sampling and Test Services

Formation Coring (FCT & FCT-L)
Mechanical Sidewall Coring (MSC)
Reservoir Characterization Test (RCT)
Reservoir Characterization Test-Slim (RCT-S)
Reservoir Characterization Test-Express (RCT-X)
Reservoir Characterization Test in Casing (RCT-C)
Repeat Formation Test (RFT)
Formation Test, Fluid Analysis, Pump-Thru (FFP)
Multi-Conductor Extreme Jar (MCE)
Cablehead Releasable (CHR)

Conveyed Services

Downhole Casing & Tubing Tractor (CTT)
Open & Casing Downhole Hydraulic Tractor (DHT/DHT-S)
Pipe Conveyed Logging (PCL)

Casedhole WL Services

Ultrasonic Scan Imaging Log (USI-V/USI-G)
Cement Bond Log & Variable Density Log (CBL/VDL)
Radial Cement Bond Log (RBM/OSB/DSB)
Hexapod Segmented Bond Log (HSB)
Down Hole Camera (DHC)
Gyroscope Orientation Log (GOT)
Free Point Indicater (FPI)
Magnetic Thickness Log (MTT)
Multi-Finger Imaging (MFI)
Casing Orientation with Dipole Sonic (ORT-C)
Hydraulic Plug Setting (PST/PST-5/PST-20)
Through Tubing Permanent Bridge Plug (TBP)
Mechanical Downhole Cutter (MDC)
Milling Downhole Cutter-W (MDC-W)
Noise Detect Log (NDT)

Vertical Seismic Profile Services

Multilevel Vertical Seismic Profile (MultiVSP)
Geophysics Vertical Seismic Profile Tool (GeoVSP)
Vertical Seismic Profile-Slim (SlimVSP)
Piezoelectric Vertical Seismic Profile (PiezoVSP)
Magnetic Vertical Seismic Profile Tool (MagnetVSP)
Microseismic Monitor with Downhole Hydraulic Tractor (MagnetVSP+DHT)
Air Gun Vibrator/Sparker Fire Vibrator

Production Logging Services

Production Logging Service (PLT/PLT-M/PLT-20M)
Optical Gas Hold-up Tool (OGH/OGH-M)
Flow Imaging Scanner (FIS/FIS-M)
Reservoir Mornitor Log (RMT/RMT-M)
Ultrasonic Sand Detection Tool (USD)

Services (Equipment) Ability

Data Analysis

Process GV/SLB/Baker/Halliburton etc. data (PI VIEW)

Conventional Petrophysics Analysis (CPA)

Wellhole Imaging Analysis (WIA)

Nulcear Magnetic Resonance Analysis (NMR)

Formation Test Analysis (FTA)

Sonic Waveform Analysis (SWA)

Production Logging Analysis (PLA)

Vertical Seismic Profile Analysis (VSP)

Casing & Cementing Inspection 3D Image (3DI)

Reserves and Reserves Parameters Calculation

Oil Field Development Dynamic Analysis

Geological Model and Numerical Simulation Research

Reservoir Study on Remaining Oil and Potential

GeoSteering While Drilling (GSD)

Completion & Coiled Tubing Tools

Geological Research and Reservoir Evaluation

Coiled Tubing Drilling and Sidetracks (ComCTD)

Coiled Tubing Integration CompletionNew

Technology Completions

Engineering with Coiled Tubing

Fracturing Evaluation Technology

Perforation/Cutting/Completion

Through Tubing Perforation

Tubing Conveyed Perforation

TCP Underbalance Perforation

Horizontal Well Perforation

E-selective Perforation

Fracgun Perforation

Radical Cutting Torch (CUT)

Punch Torch Cutter (PTC)

Pipe/Tubing/Casing Cutting

5 k/10 k psi Well Completion

Surface Equipment

Logging Truck With 7 & Mono Conductor

Logging Skid With 7 & Mono Conductor

Pressure Control Equipment

Anti-explosion Operation Unit

PI Data Acquisition System (PIDAS)

Geo-Vista

Features

- The system records the data including the original signal of the instrument, calibrated engineering value and the processed data. Because the original signal of the instrument is recorded, the logging data could be reprocessed by different parameters if required.
- All of the calibration value and verification value could be displayed by the operator, therefore, it is easy to confirm: the value of the super-value will flash, causing the operator's attention.
- Repeated curves can be real-time displayed on the main logging curves to verify the repeatability of the curves.
- Real-time plotting of cross-plot graphs allows the operator to verify the correctness of the logging response which is based on the expected model.
- Real-time environmental correction eliminates the subjective assessment of the operator's quality control process.
- Real-time similarity correction verifies the integrity of the acoustic waveform data.
- Using personnel safety and data protection systems.
- Reduces wellsite operating time and ensure system reliability by using advanced computer technology and redundant design simplify data acquisition and processing.

* Telemetry :

MGTS
SGTS
RGTS

Wireline Perforating Panel (WPP)

Features

- Wide voltage input (100 Vac-240 Vac)
- With safety switch
- PFC power supply is up to 150 V, and perforating and coring power supply adopts the mode of external DC power supply
- The polarity of perforating and coring voltage is adjustable

Introduction

The PI Data Acquisition System (PIDAS) is designed for data acquisition and processing in combination with Open-hole and Cased Hole tool. This PIDAS is based on portable notebook as a host and remote transmission system with high-speed data communication.

Specifications

Physical Dimensions & Weights	
Height	29.13 in. (740 mm)
Depth	29.33 in. (745 mm)
Width	27.56 in. (700 mm)
Shipping Weight	160.9 lbs. (73 kg)
Environmental Characteristics	
Operating Temperature	0°C~+50°C
Storage Temperature	-20°C~+75°C
Relative Humidity	＜95%
Vibration (3D)	3 g 10-60 Hz (When not working)
Shock (3D)	3 g 10-60 Hz (When not working)
System Power Supply	85-265 Vac, 43 Hz-70 Hz
Downhole Instrument Power Supply	
AC Power	0-720 Vac, 2 A, 1440 W
	0-1440 Vac, 1 A, 1440 W
DC Power	0-1000 Vdc, 2 A, 2000 W

System Composition

Portable surface logging system is divided into: data acquisition system, power supply system and other major parts. The functions of each part is as follows:

1. Surface Data Acquisition System: the computer is the core, controlled by several loaded software, to complete a variety of logging operations. Such as the processing, recording, display, quality control and fast processing and interpretation of logging data on the wellsite. Including: PC, Wireline Acquisition Panel (WAP).
2. Power Supply System provides power to the surface system and downhole equipment. Currently, logging power supply system usually use vehicle generators or wellsite power.
3. Hoist Display Unit (HDU) is the display unit for the Surface System. Equipped with a color LCD touch screen display, the unit provides a continuous display of depth information. In addition, HDU also displays other variables monitored and provides a visual and audible alarm when any of these variables are outside a preset range.

Features

- Used for a variety of downhole instruments for openhole and cased hole with different modules.

  PI Data Acquisition System (PIDAS)

  Post-processing & presentation management (FileView)

  PI Wireline Formation Sampling and Testing System (PIWST)
  - ·PI Formation Coring Software (PIWST-FCT)
  - ·PI Mechanical Sidewall Coring Software (PIWST-MSC)
  - ·PI Reservoir Characterization Tester Software (PIWST-RCT)
  - ·PI Formation Test, Fluid Analysis, Pump-Thru Software (PIWST-FFP)

  PI Production and Engineering Logging System (PIPES)
  - ·PI Down Hole Camera Software (PIPES-DHC)
  - ·PI Free Point Indicator Software (PIPES-FPI)
  - ·PI Mechanical Downhole Cutter (PIPES-MDC)
  - ·PI Rotary Magnet Ranging Software (PIPES-RMR)
  - ·PI Gyroscope Orientation Software (PIPES-GOT)
  - ·PI Downhole Casing & Tubing Tractor Software (PIPES-CTT)
  - ·PI Downhole Hydraulic Tractor Software (PIPES-DHT)
  - ·PI MFI Logging System (PIPES-MFI)
  - ·PI Memory Acquisition and Processing Software (PIPES-MAP)

  PI Vertical Seismic Profile System (PIVSP)

  Microseismic monitoring data processing and interpretation software (MMDPI)

  PI Logging While Drilling System (PILWD)
  - ·PI Rotary Steerable Software
  - ·PI LWD Data Presentation Software
  - ·PI LWD Remote Monitoring Software
- Using multi-window to display nuclear logging equipment which is obtained by the spectrum, acoustic and imaging instruments. These windows can be controlled by the user, in order to display the original data or the processed data, so that, the operator can control the quality of the real-time logging data.
- Provides Multi-tasking and distributed processing at the wellsite, improving log data integrity and wellsite efficiency.

PIDAS Software Introduction

The PIDASView software contains two parts: PIDAS software and FileView software. Each part can run independently.

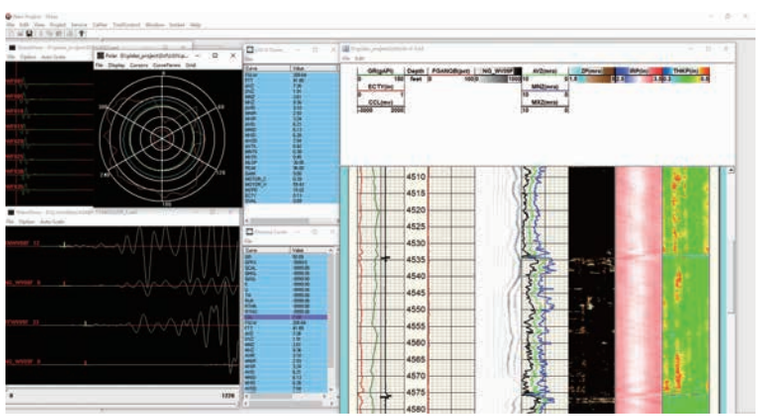
The PIDAS software is a control acquisition processing system based on WINDOWS with multi-task & multi-user, and using a large number of modern image processing technology.

The control acquisition processing system is used to acquire and process various signals of the downhole logging instrument detectorand to control other functions of the downhole instrumentand converts the acquired signals to engineering values and provides the logging data required by the user.

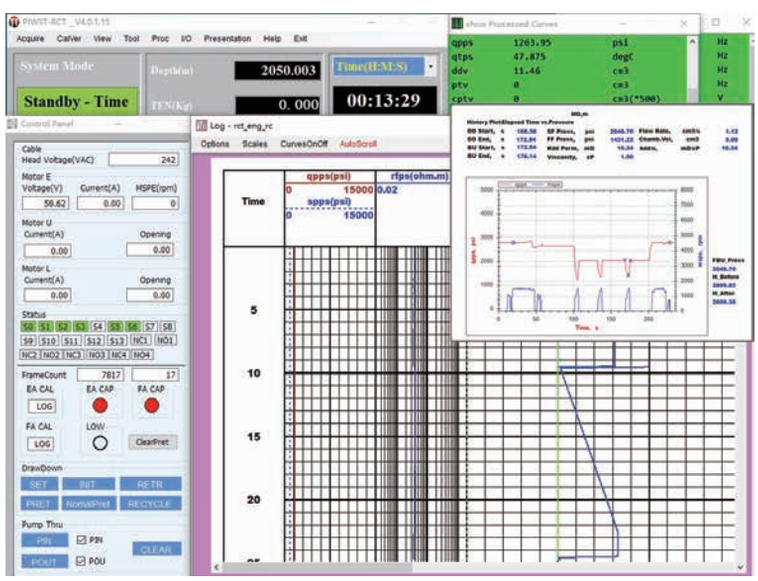
By equipment array, imaging and large information, real-time logging data acquisition, control and processing achieve multi-parameter acquisition and multi-task time-sharing processing.

PIDAS software can be used for a variety of downhole instruments for openhole and cased hole with different modules.

The FileView is a post-processing and presentation software. It can support the basic functions, such as the heading, toolstring, well sketch, calibration, parameters, log plot, data convert, etc. Also, it can provide the data analysis and processing, 2D, 3D, cross plot, compose plot, etc. advanced functions.



USI-G/CBL/VDL service by PI Data Acquisition System module



Pressure Test and Sampling service by PI Reservoir Characterization Tester Software PIWST-RCT module

Safe Direction Drilling Panel-II (SDD-II)

Geo-Vista

Features

- Improved A/D capabilities for more resolution.
- Improved signal processing via DSP.
- Dual Pressure Transducer (DPT) algorithm to remove signal reflections (for combinatorial encoding).

Benefits

- The analog and digital signals are routed through the isolation sampled by a multiple channel, high resolution analog-to-digital converter with a very low noise. The digitized signals are then further processed on a digital floating point signal processor.
- Algorithms designed to cancel out drilling and pump noise are applied and the original downhole pulser signal is reconstructed.

Introduction

SDD-II is a high performance, safe area data acquisition and processing unit for retrieving high speed MWD/LWD telemetry information. The SDD-II accepts signal inputs from up to different analog and digital sensors. The SDD-II data acquisition panel also integrates a by-pass controller component. The negative pulse generator can be controlled to change the amount of mud flowing to the downhole in the riser, so as to achieve the function of transmitting commands and controlling downhole instruments.

Specifications

Mechanical Characteristics

Physical Dimensions & Weights	
Height	20.47 in. (520 mm)
Depth	16.54 in. (420 mm)
Width	8.86 in. (225 mm)
Shipping Weight	30.86 lbs (14 kg)

Temperature Characteristics

Operating Temperature	32 to 122°F (0 to 50°C)
Storage Temperature	14 to 185°F (-10 to 85°C)

Electrical Characteristics

System Power Supply	85~265 Vac, 43 Hz~70 Hz
Supply Current	1.8 A
Fuse	2 A

Ethernet Network

Network Interface	10 BaseT/100 BaseTx (auto-sensing)
Connector	RJ45 compatible
IP Address / DHCP	Configurable through PI Advantage software

Sensor

Sensors	Pressure, Block Height, Hookload
	Flow, RPM, Torque, Pump Strokes (upgraded)

Services

MWD/LWD/RSS/GSD

Openhole Wireline Logging System

Cased hole Wireline Logging System

Production Logging System

Wireline Engineering System

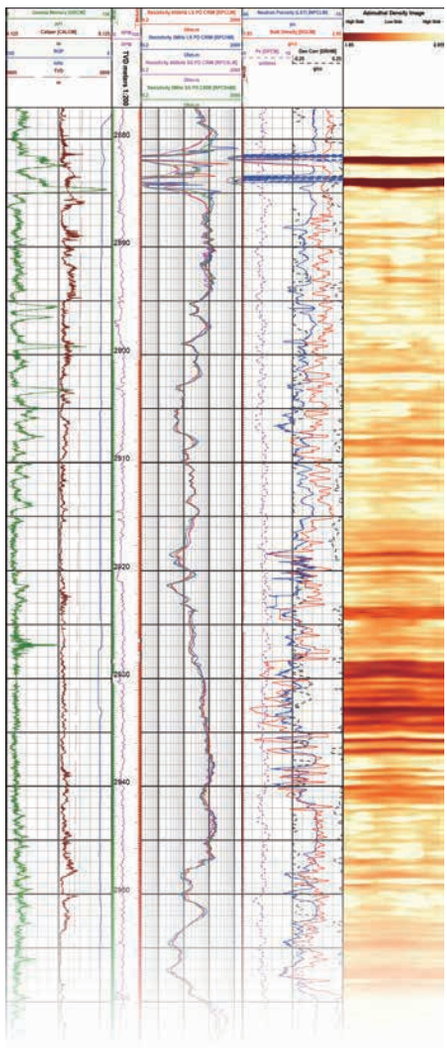
Wireline Sampling & Testing System

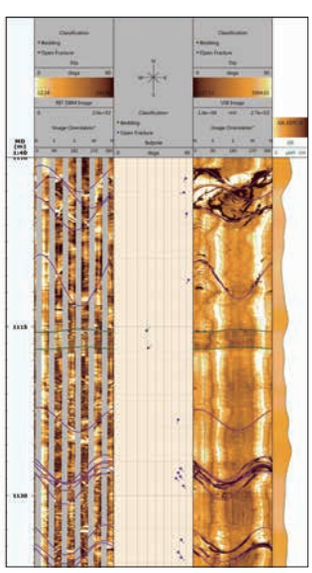
Micro-seismic Real-time Monitoring

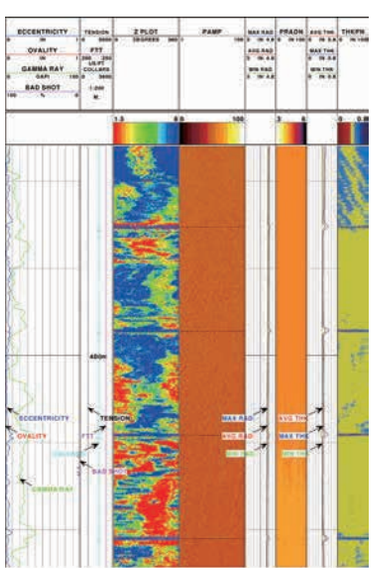
Data Analysis & Reservoir Research

Common Coiled Tubing Drilling

Perforation/Cutting/Completion







friendly cooperation **Serving Oil & Gas Industry** **Geo–Vista**

ComLWD

MWD

CCN / GCN + CWD

RAD

AWD

PWD/PCD

EPR

IGR

Downhole Motor

NB-AGR

ComLWD

Wireless Measurement While Drilling (MWD)

Maximum Pressure		20000 psi (137.9 MPa) /25000 psi (172 MPa) (Option)
Maximum Temperature		300°F (150°C)/350°F (175°C) (Option)
Tool O.D.	Battery	3.375 in.
	Generator	4.75 in./6.75 in./8.25 in./9.5 in.
Pulser Type		Rotary Pulser/Solenoid Pulser
Transmission Rates	Solenoid Pulser	0.2 bit/s~2 bit/s Pulse Width Selectable:3.0/2.0/1.5/1.0/0.8/0.5/0.36/0.32/0.24 sec
	Rotary Pulser	0.2 bit/s~2 bit/s Pulse Width Selectable: 3.0/2.0/1.5/1.0/0.8/0.5/0.36 sec
Pulse Width Selectable		3.0/2.0/1.5/1.0/0.8/0.5/0.36/0.32/0.24 sec
Vibration Measurement		Shock and vibration measurements using a Triaxial Accelerometer arrangement
Sensors		Min., Max., and Ave. RPM measurements using dual Magnetometers

Measurement	Range	Resolution	Accuracy
Inclination	0° - 180°	0.1°	± 0.15°
Azimuth[1,2]	0° - 360°	0.35°	± 1.0°
Toolface			
Magnetic[1]	0° - 360°	1.4°	± 1.5°
Gravity[2]	0° - 360°	1.4°	± 1.5°
Temperature	150°C / 175°C (Option)	2°C	± 3.0°C
Dip Angle[1]	-90° - 90°	0.044°	± 0.3°

MTF/GTF Switching Inclination Degrees:Operator Selectable (default set at 5°)

1: Assumes typical magnetic field values at 30° latitude.
2: Accuracy applies to inclinations greater than 5.0°.

Tool Size	Restrictor ID	Flow Range (gpm)	Flow Range (lpm)
3-3/8 in.	40 mm	80-160 gpm	302-605 lpm
4-3/4 in.	49 mm (standard) 47 mm (low flow)	160-320 gpm 160-225 gpm	606-1,211 lpm 606-833 lpm
6-3/4 in.	52 mm (standard) 50 mm (low flow)	300-675 gpm 300-450 gpm	1,136-2,555 lpm 1,136-1,703 lpm
8-1/4 in.	54 mm (standard) 53 mm (low flow)	400-900 gpm 400-600 gpm	1,514-3,407 lpm 1,514-2,271 lpm
9-1/2 in.	57 mm (standard) 55 mm (low flow)	600-1,350 gpm 600-900 gpm	2,271-5,100 lpm 2,271-3,407 lpm

Gyroscope Wireless Measurement While Drilling (GyroMWD)

Maximum Temperature	185°F (85°C)
Maximum Pressure	20,000 psi (137.9 MPa)
Probe OD	1.75 in. (44.5 mm)
Inclination Range	0 ~ ± 90°
Inclination Accuracy	± 0.15°
Azimuth Range	0 ~ 360°
Azimuth Accuracy	±2° (@ Inclination > 3°)
Gyro Toolface Range	0 ~ 360°
Gyro Toolface Accuracy	± 2°
North-seeking Time	≤ 2 min
Power Supply	Battery

Pressure Unit While Drilling (PWD)

Tool O.D.	4.75 in. / 120 mm	6.75 in. / 172 mm	8.25 in./210 mm
Maximum Pressure	20000 psi (137.9MPa)/25000 psi (172 MPa) (Option)		
Maximum Temperature	300°F (150°C)/350°F (175°C) (Option)		
Length	5 ft.-6.93 in. (1.7 m)	4 ft.-3.18 in. (1.3 m)	4 ft.-8 in. (1.424 m)
Flow range	160-320 gpm	300-675 gpm	400-900 gpm
Data Acquisition Type	Real-time & Downhole Record		
Data Transmit Type	Data Transmit Type Positive pulse		
Pressure Measurement Range	0 - 25000 psi		
Accuracy	Accuracy ± 0.25% full scale		

Inclination and Gamma Ray (IGR)

Tool OD	3.375 in./4.75 in./6.75 in./8.25 in./9.5 in.
Maximum Pressure	20000 psi (137.9MPa)/25000 psi (172 MPa) (Option)
Maximum Temperature	300°F (150°C)/350°F (175°C) (Option)
Gamma Specification	
Type	Scintillation
Measurement	API GR
Range	0 ~ 250 API
Accuracy	±3% API of full scale
Vertical resolution	6 in. (153 mm)
Inclination Specification	
Maximum Temperature	150°C/175°C (Option)
Sensor Type	Z axis accelerometer
Range	0 - 180° degrees
Accuracy	±1°@inC>30°

Near-Bit Azimuth Gamma & Resistivity (NB-AGR)

Tool Size	4.75 in./6.75 in.			
Maximum Pressure	20000 psi (137.9 MPa)			
Maximum Temperature	300°F (150°C)			
Gamma Specification			Electromagnetic Wave Type	Electric Current
Crystal Type	Scintillation	Tool Length	914mm	
Measurement	API GR	Tool OD	5.4 in. (138 mm)/7.25 in. (184 mm)	
Measuring Accuracy	0 - 500 API	Modulation Type	ASK	GMSK
Measuring Accuracy	± 3% API of full scale	Baud Rate	20 Baud	
Vertical Resolution	6 in. (153 mm)	Supply Voltage	7.3 V	+12V to 24V
NB-AGR Specification		Current and Power	470 mA @ 7.3 V (3.43 W)	120 mA @ 22 V (2.64 W)
Sensor Type	X-Y axis accelerometer	Connection	4-1/2 REG	
	Z axis accelerometer	Transmission Distance	20 m	
Measuring Range	0 - 180°	Battery working time	150 hours	240 hours
Measuring Accuracy	± 1°@INC>30°	Inclination and gamma measurement points	450 mm (Behind the drill bit)	

Electromagnetic Propagation Resistivity (EPR)

Tool O.D.		3.375 in.	4.75 in.	6.75 in.	8.25 in.
Hole Sizes		3.75 in. to 5.875 in. (96-150 mm)	5.875 in. to 6.75 in. (150-172 mm)	8.5 in. to 9.875 in. (216-251 mm)	10 in. to 12.25 in. (254-311 mm)
Pressure		20,000 psi (137.9 MPa)			
Temperature		300°F (150°C)			
Length		7.4 ft. (2.3 m)	12 ft. (3.7 m)	12 ft. (3.7 m)	12 ft. (3.7 m)
Weight		175 lbs. (79 kg)	600 lbs. (272 kg)	1,280 lbs. (581 kg)	1,595 lbs. (725 kg)
Connections		3 in. CDP Box Uphole	3-1/2 in. I.F. box up and	4-1/2 in. I.F. box up and	6-5/8 in. Reg box up and
		3 in. CDP Pin Downhole	3-1/2 in. I.F. box down	4-1/2 in. I.F. box down	6-5/8 in. Reg box down
Dogleg Severity	Max. Rotating	20°/100 ft. (20°/30 m)	12°/100 ft. (12°/30 m)	9°/100 ft. (9°/30 m)	8.2°/100 ft. (8.2°/30 m)
	Max. Sliding	45°/100 ft. (45°/30 m)	30°/100 ft. (30°/30 m)	16°/100 ft. (16°/30 m)	8.2°/100 ft. (8.2°/30 m)
Lost Circulation Material		Fine to medium nut plug			
Pulsation Damper		Recommended, 1/3 Standpipe Pressure			
Data Acquisition		Mud pulse telemetry to surface and downhole memory			
Telemetry Type		Positive Pulse			

		2 MHz Resistivity	400 kHz Resistivity
Phase Difference	Range	0.1 to 3,000 ohm-m	0.1 to 1,000 ohm-m
	Accuracy	±1% (0.1 to 50 ohm-m) ± 0.5 mmho/m (> 50 ohm-m)	± 1% (0.1 to 25 ohm-m) ± 1.0 mmho/m (>25 ohm-m)
Attenuation	Range	0.1 to 500 ohm-m	0.1 to 200 ohm-m
	Accuracy	± 2% (0.1 to 50 ohm-m) ± 1.0 mmho/m (> 50 ohm-m)	± 5% (0.1 to 10 ohm-m) ± 5.0 mmho/m (>10 ohm-m)
	Vertical Resolution	8 in. (20 cm) for 90% response in conductive beds	12 in. (30 cm) for 90% response in conductive beds

Azimuthal Resistivity Drilling (ARD)

Tool O.D.	4 3/4 in. (121 mm) / 6 3/4 in. (172 mm)	Maximum bending torque	
Applicable borehole size	5 7/8 in. ≤ 3/4 in. / 8 3/8 in.-10 5/8 in.	Rotating	7 kft-lbs (10 kNm) / 20 kft-lbs (27 kNm)
Common borehole size	6 1/8 in. (156 mm) / 8 1/2 in. (216 mm)	Sliding	16 kft-lbs (22 kNm) / 61 kft-lbs (82 kNm)
Tool length	11.03 ft. (3.36 m)	Maximum temperature	300°F (150°C)
Tool weight	672 lbs (305 kg) / 1274 lbs (578 kg)	Maximum pressure	20000 psi (1378 bar)
Equivalent stiffness OD×ID	4.755 in.×2.165 in. / 6.755 in.×2.165 in.	Sensor Specifications	
Type of cut-off sub upper connector	NC38 / NC50 Female thread	Distance between measuring point and tool bottom	5.46 ft. (1.66 m)
Type of connector	GT4 / GT6	Detection boundary	17 ft. (5.2 m)
Operating specifications and restrictions		Statistical repetition rate	±2%
Displacement limited by LWD	125-350 gpm / 200-900 gpm	Vertical resolution	24 in. (61 cm) (High resolution)
Maximum pull	534 kibs (2376kN) / 704 kibs (3132 kN)	Azimuth quadrant	16

Electromagnetic Measurement While Drilling (EMWD)

O.D.	4.75 in. (120 mm) / 6.75 in. (172 mm) / 8.25 in. (210 mm)
Deviation/Orientation/Tool Face	0-180° ± 0.1°/0-360° ± 0.5°/0-360° ± 0.5°
Data Transmission Rate	3.5-11 bit/s
Maximum Pressure/Temperature	14500 psi (100 MPa)/ 257°F (125°C)
Applicable Mud/Gas Displacement	15-50 L/s, 30-100 m³/min

Caliper Corrected Neutron Porosity (CCN)

Diameter		4.75 in. With 5.59 in. upset	6.75 in. with 7.50 in. upset	8.25 in. With 10.125 in. upset
Maximum Pressure		20000 psi (137.9 MPa)		
Maximum Temperature		300°F (150°C)		
Weight		1100 lbs. (498 kg) (CCN and RAD 4)	893 lbs. (405 kg)	1325 lbs. (600 kg)
Service		Formation Porosity		
Tool Type		Caliper Corrected Neutron		
Maximum Dogleg	Rotating	15°/100 ft. (15°/30 m)	9°/100 ft. (9°/30 m)	6.5°/100 ft. (6.5°/30 m)
Severity	Sliding	30°/100 ft. (30°/30 m)	16°/100 ft. (16°/30 m)	12°/100 ft. (12°/30 m)
Detectors		Lithium-6 Iodide Crystal with Photomultiplier tube for both Near and Far detectors		
Porosity Accuracy		0.5 pu below 10 pu, 5% of reading for 10-50 pu		
Vertical Resolution		24 in. (61 cm)		
Statistical Repeatability		± 0.6 pu@20 pu @ 200 ft./hr.		
Maximum Logging Speed		180 ft./hr (@2 points/ft.)		
Depth Of Investigation		10 in. estimated for 8.5 in. 10 pu borehole		
Radioactive Source		Am 241 - Be Strength: 5 Curies (185 GBq)		
Measure Point		4.6 ft. (1.4 m) (From downhole tool end)		
Voltage		30 Vdc		
Current Draw		160 - 170 mA		

Rotary Azimuthal Density (RAD)

Diameter		4.75 in.	6.75 in.	8.25 in.
Maximum Pressure		20000 psi (137.9 MPa)		
Maximum Temperature		300°F (150°C)		
Weight		1100 lbs. (498 kg) (CCN and RAD 4)	1092 lbs. (495 kg)	1945 lbs. (881 kg)
Service		Formation Bulk Density Service with Hole Caliper		
Tool Type		Rotational Azimuthal Density		
Maximum Dogleg	Rotating	15°/100 ft. (15°/30 m)	9°/100 ft. (9°/30 m)	6.5°/100 ft. (6.5°/30 m)
Severity	Sliding	30°/100 ft. (30°/30 m)	16°/100 ft. (16°/30 m)	12°/100 ft. (12°/30 m)
Detectors		NaI Scintillation Crystal with photomultiplier tube for both Long and Short Spaced detectors		
Density Specifications				
Range		1.6-3.1 g/cc		
Accuracy		± 0.015 g/cc		
Statistical Repeatability		± 0.025 g/cc@200 ft./hr (60 m/hr) and 2.5 g/cc		
Vertical Resolution		18 in. (45 cm) (full resolution)		
Downhole End Measure Point		5.1 ft. (1.5 m)		
Photoelectric Factor Specifications				
Range		1-10 Barnes/electron (B/e)		
Accuracy		± 0.25 B/e from 2-5 B/e		
Statistical Repeatability		± 0.25 B/e@200 ft/hr (60 m/hr)		
Vertical Resolution		6 in. (150 mm) (full resolution)		
Downhole End to Pe Measure Point		5.1 ft. (1.5 m)		
Acoustic Standoff Caliper Specifications				
Accuracy		0-2 in. (Out of housing) ±0.075 in. (0 to 0.5 in.) ±0.125 in. (0.5 to 1.0 in.) ±0. 25 in. (1.0 to 2.0 in.) Out of housing		
Maximum Logging Speed		180 ft./hr (@2 points/ft.)		
Radioactive Source		Cs137 Strength: 2 Curies (74 GBq)		
Voltage		30 V		
Current Draw		350 mA~390 mA		

Acoustic While Drilling (AWD)

Diameter		4.75 in.	6.75 in.
Tool O.D.		4.82 in. (122.43 mm)	6.9 in. (175.26 mm)
Hole Size		5.625 to 8 in. (143 to 203 mm)	8.5 in. (216 mm) to 10.625 in. (270 mm)
Max. Operating Temperature		300°F (150°C)	
Max. Operating Pressure		20,000 psi (137.9 MPa)	
Length		30 ft. (9 m)	23.8 ft. (7.254 m)
Weight		1,760 lbm (798 kg)	2,500 lbm (1,134 kg)
Thread Connections	HbuildLWD	GT4 box up / GT4 pin down	GT6 box up / GT6 pin down
	ComLWD	NC38 box up/NC38 pin down	NC46 box up / NC46 pin down
Makeup Torque		8845 ft.-lbf (11.984 N.m)	25,000 ft.-lbf (33.895 N.m)
Max. Dogleg Severity	Rotating	15°/100 ft. (15°/30 m)	8°/100 ft. (8°/30 m)
	Sliding	30°/100 ft. (30°/30 m)	16°/100 ft. (16°/30 m)
Max. Flow Rate		400 gal US/min. (1,514 L/min.)	800 gal US/min. (3,028 L/min.)
Max. Sand Content		3%	
Max. LCM Size		0.63 in. (16 mm)	
Average Inertia		62 in.	
Transmitters Number		1	
Receivers Number		4	
Measurement Type		Compression Wave & Shear Wave	
Accuracy, us/ft. (us/0.305 m)		± 1	
Measurement Range		All tools 40-230 us/ft. dependent on mud type	
Max. Shock		250 g for 100,000 cycles	
Measure Point From Tool Bottom		14 ft. (4.267 m)	

Nuclear Magnetic Resonance Imaging While Drilling (MRI)

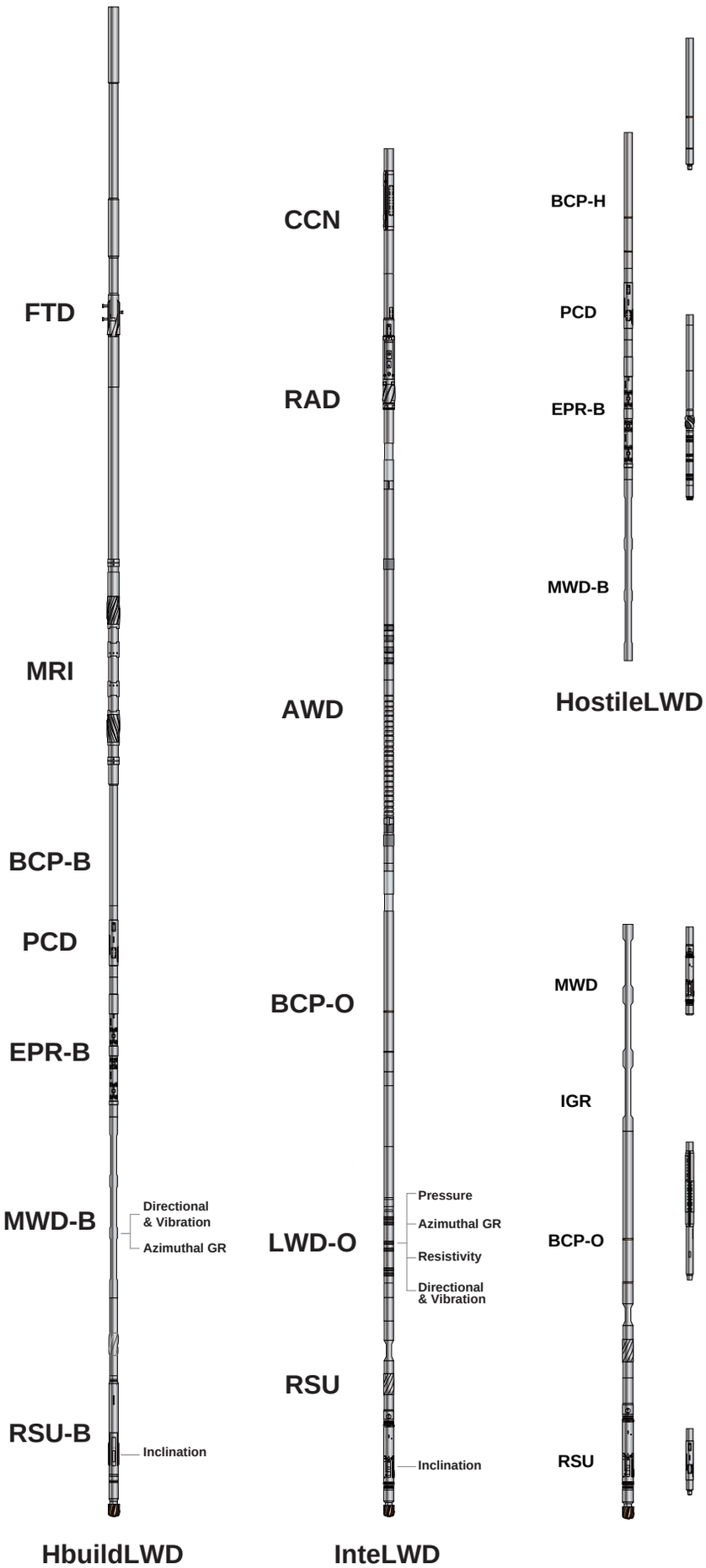
Max. Tool O.D. (Single-sleeve Stabilizer)		6.9 in. (175 mm) (single-sleeve stabilizer)
Maximum Pressure		20,000 psi (137.9 MPa)
Maximum Temperature		300°F (150°C)
Make-up Length		32.38 ft. (9.87 m)
Weight		3385.4 lbm. (1535.6 kg)
Borehole Size Range		8.25 to 10.375 in. (20.96-26.36 cm)
Normal Collar O.D.		6-3/4 in. (171.5 mm) API tolerance
Thread Connections		GT6 box up/ GT6 box down
Vertical Resolution Static		1.5 in./min/4 in./min (3.81 cm/min-10.16 cm/min)
Vertical Resolution Dynamic		10 in.@50 ft./h (25.4 cm@15 m/h)-0.25 m/min 20 in.@100 ft./h (50.8 cm@30 m/h)-0.5 m/min
Measurement of Porosity		0-100 pu
Min mud Resistivity		0.02 ohm.m
Shell Diameter		15 in. (381 mm)
Shell Thickness		0.24 in. (6 mm)
Max. Number of Echoes		2000
Min. Echo Spacing		0.6 ms
T_2 Distribution		0.5 to 5,000 ms
Precision		<.10 pu/PAP
Depth of Investigation		14 in. (356 mm)
Static Field Gradient		58 gauss
Freq of Sensitive Volume		245 kHz
Operating Position		Centralized
Hole Deviation		Vertical to Horizontal
Power Supply		Turbine alternator
Dogleg	Sliding	16°/100 ft. (16°/30 m)
	Rotating	8°/100 ft. (8°/30 m)
Max. System Shock Level		30 min at shock level 5 (50-gn threshold or accumulated 200,000 shocks above 50 gn)
Torque		23,500 ft. lbf (31,800 N.m)
Max. PH		<9

Formation Tester While Drilling (FTD)

		4.75 in.	6.75 in.
Tool Design			
Measurement Type		Probe pretest	
Pressure Gauges		High-precision quartz and strain	
Power Supplies		Battery, MWD turbine power	
Measurement Specifications			
Probe Dimensions		1.75 in. (44.45 mm) OD 0.44 in. (11.18 mm) ID	2.25 in. (57.15 mm) OD 0.56 in. (14.22 mm) ID
Pretest	Volume	0 to 25 cm³, fully adjustable	
	Drawdown Rate	0.1 to 2.0 cm³/s	
	Delta Pressure	6,000 psi (41 MPa)	>6,000 psi (>41 MPa)
Setting Piston Diameter Reach		1.38 in. (35.05 mm) more than tool OD	2.00 in. (50.00 mm) more than tool OD
Memory Capacity		Up to 120 pretests depending on time downhole	80 pretests of 5 min. duration
Battery Capacity		150 pretests 1 cm³/s at 3,200 psi (22 MPa) drawdown at 275 °F (125 °C)	
General Specifications			
Tool Max. O.D.		4.82 in. (122.43 mm) 0.75 in. (146.05 mm) 5.5 in. (139.7 mm) Optional	8.25 in. (209.6 mm) 9.25 in. (234.95 mm) with optional collar
Tool Length		40.2 ft. (12.3 m)	31 ft. (9.45 m)
Weight		2,000 lbm (907 kg)	2,866 lbm (1,300 kg)
Thread Connections		GT4 box up/GT4 box down	GT6 box up/GT6 box down
Operating Temperature		300°F (150°C)	
Mechanical Specifications			
Max. Dogleg Severity	Rotary Mode	15°/100 ft. (15°/30 m)	8°/100 ft. (8°/30 m)
	Sliding Mode	30°/100 ft. (30°/30 m)	16°/100 ft. (16°/30 m)
Axial And Lateral Shocks		10g rms	
Hydraulics			
Max. External Pressure		20,000 psi (138 MPa)	
Flow Range		0 to 400 gal/US/min. (0 to 1,514 L/min.)	0 to 800 gal/US/min. (3,028 L/min) (standard)

Note: Specifications are subject to change.

HbuildLWD



Bi-directional Communication Power Module (BCP-O)

Tool O.D.	4.75 in.	6.75 in.	9.5 in.
Pulser Type	Rotary Pulser/Solenoid Pulser		
Max Pressure	20,000 psi (137.9 MPa)/25000 psi (172 MPa) (Option)		20,000 psi (137.9 MPa)
Max Temperature	300°F (150°C)/350°F (175°C) (Option)		300°F (150°C)
Make-up Length	12.10 ft. (3.7 m)	10.70 ft. (3.2 m)	14.11 ft. (4.3 m)
Weight	903 lbs. (410 kg)	1,006 lbs. (455 kg)	2,392 lbs. (1,082 kg)
Flow Range	125-350 gpm	200 - 900 gpm	300 - 1600 gpm
Transmission Rates	0.2 bit/s~3 bit/s Pulse Width Selectable: 3.0/2.0/1.5/1.0/0.8/0.5/0.36/0.32/0.24 sec		
Max Turbine RPM	7000		
Output	33 Vdc ± 1		
Max Power Output	300 Watts		

Integrated Logging While Drilling (InteLWD)

Hole size		5-7/8 in. to 6-3/4 in.	8-1/2 in. to 10-5/8 in.	12 in. to 17-1/2 in.
OD		4-3/4 in.	6-3/4 in.	9-1/2 in.
Connection	Up	NC38 box	NC50 box	7-5/8 in. Reg box
	Down	3-1/2 in. Reg box	4-1/2 in. Reg box	7-5/8 in. Reg box 6-5/8 in. Reg. box
Build Rate		0-10°/100 ft. (0-10°/30 m)		0-6.5°/100 ft.
Max. Dogleg	Rotation	10°/100 ft. (10°/30 m)	13°/100 ft. (13°/30 m)	6.5°/100 ft. (6.5°/30 m)
	Dogleg	30°/100 ft. (30°/30 m)	20°/100 ft. (20°/30 m)	13°/100 ft. (13°/30 m)
Flow Range		125-350 GPM	200-900 GPM	300-1600 GPM
Power		Drilling fluid driven Turbine		
Max. RPM		400 rpm		
Max. Temperature		302°F (150°C)		
Max. Pressure		20000 psi (138 MPa)		
Sand Content		≤1%		
Max. LCM		40 ppb=114 kg/m3		
Vibration		5 g RMS		
Pressure				
Range		0 - 25000 psi		
Resolution		5 psi		
Accuracy		± 0.25% of full scale		
GR				
Tool Type		Scintillation Crystal		
Range		0-500 API		
Accuracy		± 2.5 API/100 API		
Vertical Resolution		6 in. (153 mm)		
Vibration				
Probe Type		Axial vibration z-Accelerometer / Lateral vibration x-y Accelerometer		
Accleration Range		0 to 15 g		
Frequency Range		0 to 82 Hz		
Rotating & Stick slip				
Probe Type		Two Axis Magnetometer		
Range		0 to ± 1000 rpm		
Accuracy		± 1%		
Electronic Magnetic Resistivity				
2 MHz Resistivity				
Phase Difference	Range	0.1 - 3,000 ohm-m		
	Accuracy	± 1% (0.1-50 ohm-m) ± 0.5 mmho/m (>50 ohm-m)		
Attenuation	Range	0.1 - 500 ohm-m		
	Accuracy	± 2% (0.1-25 ohm-m) ± 1 mmho/m (>25 ohm-m)		
Vertical Resolution		8 in. (20 cm) for 90% response in conductive beds		
400 kHz Resistivity				
Phase Difference	Range	0.1 - 1,000 ohm-m		
	Accuracy	± 1% (0.1 - 25 ohm-m) ± 1 mmho/m (>25 ohm-m)		
Attenuation	Range	0.1 - 200 ohm-m		
	Accuracy	± 5% (0.1 - 10 ohm-m) ± 5.0 mmho/m (>10 ohm-m)		
Vertical Resolution		12 in. (30 cm) for 90% response in conductive beds		
Azimuth Module				
Sensor Type		Tri-axial Accelerometer / Tri-axial Flux Gate		
MTF/GTF		Operator selectable (default: 3°)		
Measurement		Range	Resolution	Accuracy
Inclination		0°-180°	0.09°	± 0.15°
Azimuth		0°-360°	0.35°	± 1°
Toolface Magnetic TF		0°-360°	1.4°	± 1.5°
Gravity TF		0°-360°	1.4°	± 1.5°
Total Magnetic Field		0-100000 nT	35 nT	± 300 nT
Dip Angle		- 90°~90°	0.04°	± 0.3°

Rotary Steerable Unit (RSU)

Tool O.D.		4.75 in.	6.75 in.	9.5 in.
Max Pressure		20,000 psi (137.9 MPa)		
Max Temperature		300°F (150°C)		
Make-up Length		14.55 ft. (4.4 m)	7.22 ft. (2.2 m)	8.2 ft. (2.5 m)
Weight		881 lbs. (400 kg)	905 lbs. (410 kg)	3,638 lbs. (1650 kg)
Hole Diameter		6 in. to 6-3/4 in. (152-172 mm)	8-3/8 in. to 10-5/8 in. (212-270 mm)	12 in. to 17-1/2 in. (305 mm - 445 mm)
Build Rate		0-10°/100 ft. (30 m)	0-6.5°/100 ft. (30 m) 0-15°/100 ft. (30 m)	0-6.5°/100 ft. (30 m)
Dogleg Severity	With Rotation	10°/100 ft. (10°/30 m)	13°/100 ft. (13°/30 m)	6.5°/100 ft. (6.5°/30 m)
	Without Rotation	30°/100 ft. (30°/30 m)	20°/100 ft. (20°/30 m)	13°/100 ft. (13°/30 m)

Generator Caliper Corrected Neutron Porosity (GCN)

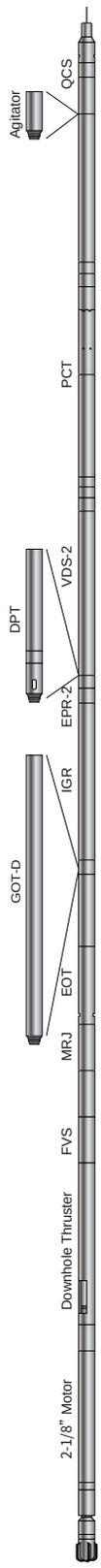
Tool Diameter	4.75 in. (120 mm)/6.75 in. (171 mm)/8.25 in. (210 mm)
Max Pressure	20,000 psi (137.9 MPa)
Maximum Temperature	300°F (150°C)
Make-up Length	15 ft.-8.98 in. (4.8 m)
Vibration	20 G, random frequency range 20~100,100 ~200 Hz
Shock	500 G, 11 ms semi-sine wave
Neutron Energy	2.5 MeV
Neutron Yield	> 1*108 n/s
Measurement Range	0 to 100 p.u.
Measurement Accuracy	0.5 p.u. below 10 p.u.; 5% of measurement otherwise
Repeatability	± 0.6 p.u. @ 20 p.u. @ 200 ft./hr.

Pressure & Caliper Measurement While Drilling (PCD)
Ultrasonic Caliper Measurement While Drilling (CWD)

Tool O.D.	4.75 in. (120mm)/6.75 in. (171 mm)/ 8.25 in. (210 mm)
Max Pressure	20,000 psi (137.9 MPa)
Maximum Temperature	300°F (150°C)
Make-up Length	6 ft.-2.8 in. (1.9 m)
Operating Time Real-Time	No Limited
Flow Range	100-300 gpm
Data Acquisition Type	Real-time & Downhole Record
Data Transmit Type	Positive pulse
Pressure Measurement Range	0-25000 psi
Caliper Measurement Range	0-2 in. (Out of housing)
Caliper Accuracy	±0.075 in. (0 to 0.5 in.) ±0.125 in. (0.5 to 1.0 in.) ±0. 250 in. (1.0 to 2.0 in.) Out of housing

ComCTD

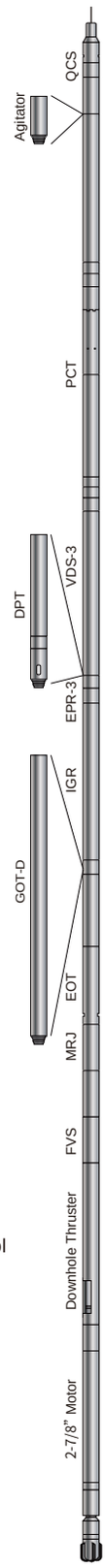
2-1/4 in. Common Coiled Tubing Drilling System-Wireline (ComCTD-2W)



2-1/2 in. Wireline ComCTD

Quick Connnect Sub (QCS)
Agitator (Optional)
Power and Communication Tool (PCT)
Vibration& Shock Digital Attitude Sensor (VDS-2)
Drilling Performance Tool (DPT) (Optional)
Electromagnetic Propagation Resistivity Tool (EPR-2)
Inclination and Gamma Ray (IGR)
Gyroscope Orientation Tool-Drilling (GOT-D) (Optional)
Electrical Orienting Tool (EOT)
Mechanical Release Joint (MRJ)
Float Value Sub (FVS)
Downhole Thruster
2-1/8 in. Motor

3-1/8 in. Common Coiled Tubing Drilling System-Wireline (ComCTD-3W)

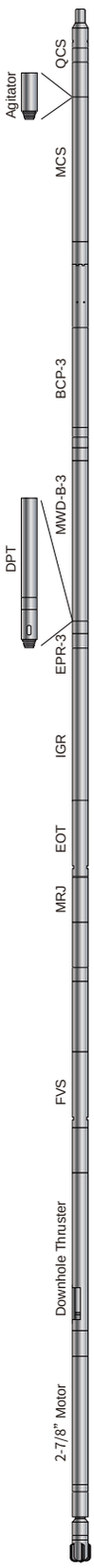


3-1/8 in. Wireline ComCTD

Quick Connnect Sub (QCS)
Agitator (Optional)
Power and Communication Tool (PCT)
Vibration& Shock Digital Attitude Sensor (VDS-3)
Drilling Performance Tool (DPT) (Optional)
Electromagnetic Propagation Resistivity Tool (EPR-3) (Optional)
Inclination and Gamma Ray (IGR)
Gyroscope Orientation Tool-Drilling (GOT-D) (Optional)
Electrical Orienting Tool (EOT)
Mechanical Release Joint (MRJ)
Float Value Sub (FVS)
Downhole Thruster (Optional)
2-7/8 in. / 3-1/8 in. Motor

ComCTD

3-1/8 in. Common Coiled Tubing Drilling System (ComCTD-3) (Mud Pulse)



3-1/8 in. Mud Pluse ComCTD

Quick Connnect Sub (QCS)
Agitator (Optional)
Mechnical Circulating Sub (MCS)
Bi-directional Communication &
Power system While Drilling (BCP-3)
Measurement While Drilling (MWD-B-3)
Drilling Performance Tool (DPT)
(Optional)
Electromagnetic Propagation Resistivity Tool
(EPR-3) (Optional)
Inclination and Gamma Ray (IGR)
Electrical Orienting Tool (EOT)
Mechanical Release Joint (MRJ)
Float Value Sub (FVS)
Downhole Thruster (Optional)
2-7/8 in. / 3-1/8 in. Motor

3-1/8 in. Common Coiled Tubing Drilling System (ComCTD-3RSS)

3 in. RSS Mud Pluse ComCTD

Quick Connector Sub (QCS)
Motor
Bi-directional Communication &
Power system While Drilling (BCP-3)
Battery Management Unit (BAT)
Measurement While Drilling (MWD-B-3)
Rotary Steering Unit (RSU-3)
Bit

LWD Services Ability					
Item \ Hole Size	4½"	6"	8½"	12¼"	Remark
✓ Enable		✗ Unable			− Conditional
Logging While Drilling					
RSU Rotary Steerable Unit	✓	✓	✓	✓	Size 3⅛", 4¾", 6¾",9½"
InteLWD Integrated Logging While Drilling	✗	✓	✓	✓	Size 4¾", 6¾",9½" Build rate:(6.5°/30 m)
HbuildLWD High Build Rate Logging While Drilling	✗	✓	✓	✓	Size 4¾", 6¾",9½"; Include AER; Build rate: (10°,15°,6.5°/30 m)
GeoLWD Geology Logging While Drilling System	✗	✓	✓	✓	Size 4¾", 6¾",8¼" Include: NB-AGR,PCD,CWD,GyroMWD,GCN
HostileLWD Hostile Logging While Drilling System	✗	✓	✓	✓	Size 3⅛", 4¾", 6¾" 350°F (175°C),25000 psi (172.4 MPa)
LithoLWD Lithology Logging While Drilling System	✗	✓	✓	✓	Size 4¾", 6¾",8¼" Include: CCN,RAD,GCN,MRI,AWD,FTD
MWD Wireless Measurement While Drilling	✓	✓	✓	✓	Size 3⅜",4¾",6¾", 8¼", 9 ½" (3⅜" battery type)
IGR Inclination and Gamma Ray	✓	✓	✓	✓	Size 3⅜",4¾",6¾",8¼", 9½"
NB-AGR Near-Bit Azimuth Gamma Ray	✓	✓	✓	✓	Size 3⅜",4¾",6¾",8¼", 9½"
EPR Electromagnetic Propagation Resistivity	✓	✓	✓	✓	Size 3⅜",4¾",6¾",8¼"
PWD Pressure Unit While Drilling	✗	✓	✓	✓	Size 4¾",6¾",8½"
CCN Caliper Corrected Neutron Porosity	✗	✓	✓	✓	Size 4¾",6¾",8½"
RAD Rotational Azimuth Density	✗	✓	✓	✓	Size 4¾",6¾",8½"
AWD Acoustic While Drilling	✗	✓	✓	✗	Size 4¾", 6¾"
MRI Nuclear Magnetic Resonance Imaging While Drilling	✗	✗	✓	✗	Max OD: 6.9"
PCD Pressure & Caliper Measurement While	✗	✓	✓	✓	Size 4¾",6¾",8½"
CWD Ultrasonic Caliper Measurement While	✗	✓	✓	✓	Size 4¾",6¾",8½"
GCN Generator Caliper Corrected Neutron	✗	✓	✓	✓	Size 4¾",6¾",8½"
FTD Formation Tester While Drilling	✗	✓	✓	✗	Size 4¾",6¾"
RMR Rotary Magnet Ranging	✓	✓	✓	✓	Tool size 1¾"

DD Services Ability					
Item \ Hole Size	4½"	6"	8½"	12¼"	Remark
Enable		Unable			Conditional
Directional Drilling					
RSU Rotary Steerable Unit	✓	✓	✓	✓	Size 3⅛", 4¾", 6¾",9½" Hbuild rate:(14°,10°,15°,6.5°/30 m)
Motor with Adjustable Bent Housing	✓	✓	✓	−	
Hydro Mechanical Drilling Jar	✓	✓	✓	✓	
Monel Collar/HWDP/Stabilizers	✓	✓	✓	✓	
XOS, Float Sub,UBHO	✓	✓	✓	✓	
NMDC Non-magnetic Drill Collar	✓	✓	✓	✓	
Bent Sub/F/J Flex Sub	✓	✓	✓	✓	
SST/MST Single-Shot Survey/Multi–Shot Survey	✓	✓	✓	✓	
GOT Gyroscope Orientation Tool	✓	✓	✓	✓	
GyroMWD Gyroscope Wireless Measurement While	✓	✓	✓	✓	Size 3½",4¾",6¾",8¼",9½"
Deirectional Drilling Cabin	Anti-explosive cabin(DD/LWD)				

Coiled Tubing Drilling						
Item \ Hole Size	3½"	4½"	6"	8½"	12¼"	Remark
Enable			Unable			Conditional
ComCTD-2W 2½ in. Common Coiled Tubing Drilling-Wireline	✓	✗	✗	✗	✗	Tool size 2½",Include:Gyroscope Orientation Tool-Drilling (GOT-D) (Optional),Inclination and Gamma Ray (IGR),Electromagnetic Propagation Resistivity Tool (EPR-2)
ComCTD-3W 3⅛ in. Common Coiled Tubing Drilling-Wireline	✗	✓	✗	✗	✓	Tool size 3⅛",Include:Gyroscope Orientation Tool-Drilling (GOT-D) (Optional),Inclination and Gamma Ray (IGR),Electromagnetic Propagation Resistivity Tool (EPR-3)
ComCTD-3 3⅛ in. Common Coiled Tubing Drilling	✗	✓	✗	✗	✓	Tool size 3⅛",Include:Wireless Measurement While Drilling-3 (MWD-3),Inclination and Gamma Ray (IGR),Electromagnetic Propagation Resistivity Tool (EPR-3)
ComCTD-3RSS 3⅛ in. Common Coiled Tubing Drilling Rotary Steering System	✗	✓	✗	✗	✓	Tool size 3⅛",Include:Wireless Measurement While Drilling-3 (MWD-3)

Open Hole Wireline Logging Services Ability

Item \ Hole Size	4½"	6"	8½"	12¼"	Dev Horiz	Remark
✓ Enable	✗ Unable				⊖ Conditional	
ComboLog	✓	✓	✓	✓	✓	**140 MPa /175°C / Anti-H_2S**
HostileLog	✓	✓	✓	✓	✓	**172 MPa (25000 psi) Φ 73 mm (2⅞")**
LithoLog	✗	✓	✓	✓	✓	No need chemical radioactive source
ThruLog	✓	✓	✓	✓	✓	140 MPa /175°C Φ ≤ 57 mm (2¼")
HTPLog+TRLog	✓	✓	✓	✓	✓	>36 hours /190°C/ 160 MPa
TLR Thin Layer Resistivity Log	✗	✓	✓	✓	✓	
ECT Elemental Capture Log	✗	✓	✓	✓	✓	
AIT Array Induction Tool	✓	✓	✓	✓	✓	
ALT High-Resolution Array Laterolog Tool	✓	✓	✓	✓	✓	
MAA Multi-dipole Array Acoustic	✗	✓	✓	✓	✓	
NMR Nulcear Magnetic Resonance	✗	✓	✓	✓	✓	
RIT-WBM/OBM Resistivity Imaging	✗	✓	✓	✓	✓	With 6 powered stand off in horiz
SRI-WBM/OBM Slim Hexapod Resistivity Imaging Log-WBM/OBM	✓	✓	✓	✓	✓	OD: 98 mm
USI Ultrasonic Scan Imaging Tool	✓	✓	✓	✓	✓	
RFT Repeat Formation Test	✗	✓	✓	✓	✓	6" OH PCL (TLC)
FCT/FCT-L Formation Coring	✗	✓	✓	✓	✓	Core size:1"(DI)*1.75"(LEN) 1.5"(DI)*2.5"(LEN)
MSC Mechanical Sidewall Coring	✗	✓	✓	✓	✓	Core size:1.5"(DI)*2.5"(LEN)
RCT Reservoir Characterization Test	✗	✓	✓	✓	✓	6" hole PCL (TLC)
RCT-S Reservoir Characterization Tester-Slim	✓	✓	✓	✗	✓	OD: 92 mm
RCT-X Reservoir Characterization Tester-Express	✓	✓	✓	✓	✓	Quick test with ComboLog
RCT-C Reservoir Characterization Test in Casing	✓	✓	✓	✓	✓	OD:98mm working in casing
MultiVSP Multilevel Vertical Seismic Profile	✓	✓	✓	✓	⊖	Max:100 levels
MagenetVSP/PiezoVSP Vertical Seismic Profile	✓	✓	✓	✓	⊖	With tractor in horiz well, no arms, through tubing
SlimVSP Vertical Seismic Profile-Slim	✓	✓	✓	✓	⊖	O.D.: 62.5 mm
DHT Downhole Hydraulic Tractor	✓	✓	✓	✓	✓	Tool size 3⅜"
PCL/TLC Pipe Conveyed Logging	✓	✓	✓	✓	N/A	

Cased Hole Services Ability

Item \ Hole Size	3½" Drilling Pipe	5 " Drilling Pipe	5½"	7"	9⅝"	13⅜"	Dev Horiz	Remark
✓ Enable			✗ Unable				⊖ Conditional	
Engineering Inspection								
USI-V/USI-G Ultrasonic Scan Imaging Log	N/A	N/A	✓	✓	✓	✓	✓	
CBL/VDL Cement Bond/Variable Density	N/A	N/A	✓	✓	✓	✓	✓	
HSB Hexapod Segmented Bond	N/A	N/A	✓	✓	✓	✓	✓	
RBM/OSB/DSB Radial Cement Bond Log	●	●	✓	✓	✓	✓	✓	RBM available for 3½" & 5" Drilling Pipe
DHC Down Hole Camera	N/A	N/A	✓	✓	✓	✓	✓	
MTT Magnetic Thickness Tool	N/A	N/A	✓	✓	✓	✓	✓	
MFI 24/40/60 Multi-Finger Imaging	N/A	N/A	✓	✓	✓	✓	✓	24,40,60 caliper optional
GOT with GR/CCL	✓	✓	✓	✓	✓	✓	✓	Running in 3½" drilling pipe
ORT-C with Dipole Sonic	✗	✗	✓	✓	✓	✓	✓	
FPI Free Point Indicator	✓	✓	✓	✓	✓	✓	✓	
VSP Fracturing Monitoring	N/A	N/A	✓	✓	✓	✓	✓	With realtime monitoring software
RCT-C Reservoir Characterization Test in Casing	N/A	N/A	✓	✓	✓	✓	✓	PVT sample optional
CTT Downhole Casing & Tubing Tractor	N/A	N/A	✓	✓	✓	✓	✓	OD:54 mm Perforation Down log with multiconductor
DHT Downhole Hydraulic Tractor	N/A	N/A	✓	✓	✓	✓	✓	
PCL/TLC Pipe Conveyed Logging	N/A	N/A	✓	✓	✓	✓	✓	

Production Logging

Item \ Hole Size	2⅜"	2⅞"	3½"	4½"	5½"	7"	Tractor	Coiled Tubing	Slickline	Dev Horiz	Remark
PLT Production Logging Tools	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Monoconductor with Coiled Tubing Could be memory type
TFD Tuning Fork Density	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Could be memory type
GHT Gas Hold-up Tool	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Could be memory type
FIS Flow Imaging Scanner	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Run with tractor Could be memory type
RMT Reservoir Monitor Tool	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Could be memory type

Cased Hole Services Ability

Engineering Equipment

✓ Enable ✗ Unable – Conditional

Item \ Hole Size	2⅜"	2⅞"	3½"	4"	4½"	5½"	6⅜"	7"	Remark
MDC-W Downhole Milling	✗	✓	✓	✓	✗	✗	✗	✗	
MDC Downhole Cutting	✗	✗	✗	✓	✓	✓	✓	✓	
TBP Through Tubing Permanent Bridge Plug	✓	✓	✓	✓	✓	✓	✓	✓	
PST/PST-20 Hydraulic Plug-Bridge Seting	✓	✓	✓	✓	✓	✓	✓	✓	
PST-5 Slickline Hydraulic Plug Setting	✓	✓	✗	✗	✗	✗	✗	✗	
SGR Shock Gamma Ray	✓	✓	✓	✓	✓	✓	✓	✓	OD: 43 mm, for perforation

Logging Unit

LOGGING TRUCK	Multi and mono conductor for open hole and cased hole
SKID	Multi and mono conductor for open hole and cased hole
ZoneII SKID	Multi or mono conductor for open hole and cased hole
BOP	5000 psi, 10000 psi, 15000psi, Anti-H_2S

Data Analysis

SPI VIEW	Can process GV/SLB/Baker/Halliburton etc. data
CPA	Conventional Petrophysics Analysis
WIA	Wellhole Imaging Analysis
NMR	Nulcear Magnetic Resonance Analysis
FTA	Formation Test Analysis
SWA	Sonic Waveform Analysis
PLA	Production Logging Analysis
VSP	Vertical Seismic Profile Analysis & Fracture Monitor Analysis
3DI	Casing & Cementing Inspection 3D Image

Realtime Monitor

GSD	Target layer real-time alarm
MWD/LWD Remote Control	Realtime Remote Data Telemetry
VSP Facture Monitor	Realtime Fracture Monitor while VSP Operation

Services

4.75 in. LWD FULLSET Tools continue drilling 1043 m in Middle East

Jan/9/2019, in Middle East, our team had done LWD FULLSET (GR+Resisitivity+Neutron+Density) job in 6.125 in. hole. The well TD was 3600 m and drilling interval was 1043 m.

LWD Fullset & WL USI-V/USI-F job in Middle East

Nov 1,2021， Geo-Vista had finished LWD fullset (GR+Resistivity+Neutron+Density) and Wireline Ultrasonic Scan Imaging CBL job on the same offshore platform.

Services

RSS/LWD operation in Daqing Oilfield, China

From November 11 to 18, 2020, Geo-Vista 6.75 in. InteLWD tools successfully operation in DaqingOilfield, China. InteLWD included: Rotary Steering System (RSS), Pressure Unit While Drilling (PWD) Near-Bit Azimuth Gamma Ray (NB-AGR), and Electromagnetic Propagation Resistivity (EPR). The tools continues Drilling 1060 m in 8.5 in. Horizontal section.

Services

Micro-Seismic Fracture Monitoring with Downhole Hydraulic Tractor

Microseismic fracture monitoring job was carried out in China in October, 2022. The hydraulic tractor conveyed 12-level geophones in 1429 meters horizontal interval of monitoring well, that hole size was 5.5 inches, totally 22 stages were in treatment well.

Services

Reservoir Characterization Tester (RCT) operated with pipe conveyed logging in Middle East

2021.4.25-2021.4.27, Reservoir Characterization Tester (RCT) was operated with pipe conveyed logging successfully achieved 32 pressure points in Middle East. The well depth is 2,860 m and the bit size is 5.875 inches.

Services

Free Point & Back-off Job in Horizatal Well

On August 24, 2023, a successfully free point indicate operation job completed with Free Point Indicator-Dual Sensor (FPI-D) in Zhongyuan Oilfield. The maximum bore-hole inclination is 82 degrees, the maximum temperature is 110 ℃, the maximum pressure is 70 MPa, and the wellbore depth is 4560 meters. The stuck point was detected at 3801.9 meters, and then, back-off depth was 3775 meters. This is the first time Geo-Vista free point job in horizatal well.

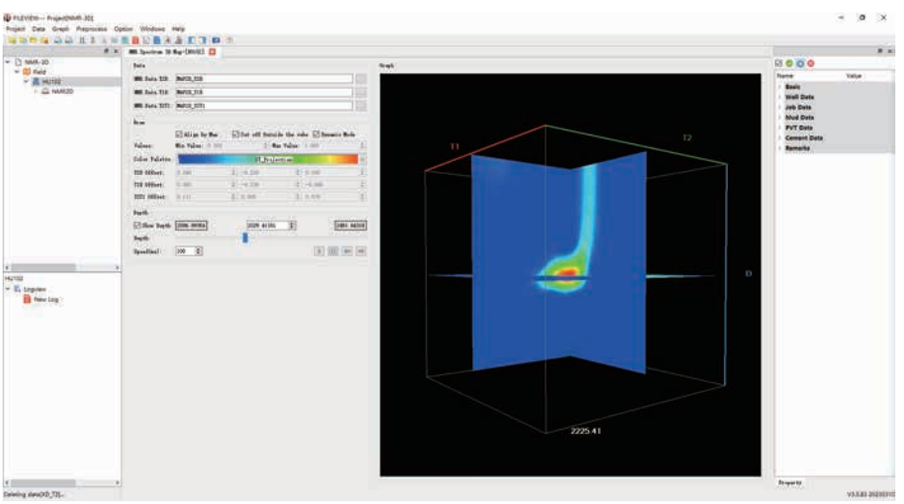
Services

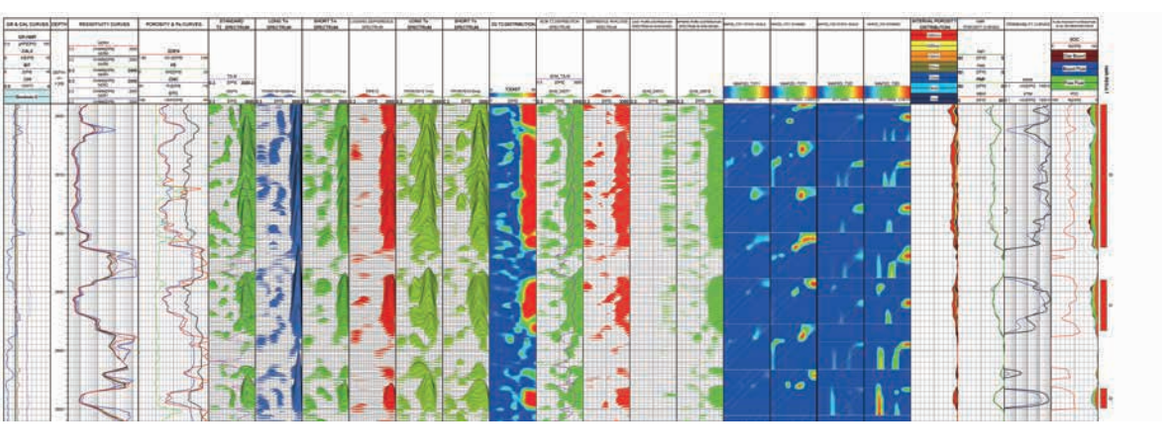
Nuclear magnetic resonance (NMR) interpretation is about data processing and T2, T1 relaxation time， and Diffusion interpretation. The T2, T1 and D three digital dimensional can show 1D, 2D plot, 3D demonstration and play back.

NMR data processing mainly include: Data Decomposing, Echo string generation, Time-Depth conversion, T2 spectrum inversion, etc.

NMR data interpretation mainly include: T2 distribution, T2 cut-off, Porosity calculation model, Permeability model, T2 differential spectrum method, T2 shift spectrum method, etc. Final output of reservoir information such as total porosity, effective porosity, T2 distribution, pore fluid identification, bound water volume, total water/oil/-gas volume and Water saturation, etc.

2D interpretation solves the problem of overlapping T2 spectrum when oil, gas, and water coexist in the pores of the formation, beneficial for identifying and quantitatively evaluating oil, gas and water.





Quality, Health, Safety and Environment Policy

HSE Policy

Company implements HSE management system and establishs a commitment to continuously improve its effectiveness:

- Company's work should be done in accordance with relevant laws and regulations, and improve product quality, protection of staff health, property & environment as priority.
- Adheres first customers' needs, uppermost integrity; serves continuously improving customers' satisfaction; always conveys satisfying customers' requirement importance to employee; improves client uppermost awareness of staff and pays attention to customer's needs and expectations.
- Continuously strengthen the staff's "legal" concept; comply with national and regional laws and regulations; keep business attitude towards HSE unchanging; ensure product quality, occupational health and safety, environmental behavior and performance; and meet the requirements of laws and regulations;
- Make guidelines, determine the company's HSE purpose and direction; take effective measures to convey and carry out the guidelines and principles by formulating goals and indicators.
- Implement scientific management; provide the necessary human, material and financial resources for the fulfillment of the HSE Management System, and persistently improve its effectiveness.

President of
Beijing Geo-Vista Technology Ltd.
25-March-2006

Services


API American Petroleum Institute

REGISTRATION NO. Q2-0285

Certificate of Registration

The American Petroleum Institute certifies that the quality management system of

BEIJING GEO-VISTA TECHNOLOGY LTD.
No. 1 Huachang Road
Science &Technology Park
Changping District, Beijing
People's Republic of China

has been assessed by the American Petroleum Institute and found to be in conformance with the following:

API Spec Q2, 1st Edition

The scope of this registration and the approved quality management system applies to the

Provision of Services for Wireline Logging and Logging while Drilling

API approves the organization's justification for excluding

No Exclusions Identified as Applicable

Effective Date: MAY 31, 2022
Expiration Date: MAY 31, 2025
Registered Since: MAY 27, 2020

Q2 API Spec Q2 Registered

Senior Vice President of Global Industry Services


API American Petroleum Institute

REGISTRATION NO. Q1-1306

Certificate of Registration

The American Petroleum Institute certifies that the quality management system of

BEIJING GEO-VISTA TECHNOLOGY LTD.
No. 1 Huachang Road
Science &Technology Park
Changping District, Beijing
People's Republic of China

has been assessed by the American Petroleum Institute and found to be in conformance with the following:

API Spec Q1, 9th Edition

The scope of this registration and the approved quality management system applies to the

Design, Manufacture and Servicing of Wireline Logging Instruments and Logging while Drilling Instruments

API approves the organization's justification for excluding

Validation of Processes

Effective Date: MAY 31, 2022
Expiration Date: MAY 31, 2025
Registered Since: FEBRUARY 8, 2012

Q1 API Spec Q1 Registered

Senior Vice President of Global Industry Services


QMS REGISTERED

Certificate of Registration

APIQR® REGISTRATION NUMBER
1492

This certifies that the quality management system of

BEIJING GEO-VISTA TECHNOLOGY LTD.
No. 1 Huachang Park
Science &Technology Park
Changping District, Beijing
People's Republic of China

has been assessed by the American Petroleum Institute Quality Registrar (APIQR®) and found it to be in conformance with the following standard:

ISO 9001:2015

The scope of this registration and the approved quality management system applies to the

Design, Manufacture and Service of Wireline Logging Instruments and Logging while Drilling Instruments

APIQR® approves the organization's justification for excluding:

8.5.1(f) Validation and Periodic Revalidation of Processes

Effective Date: MAY 31, 2022
Expiration Date: MAY 31, 2025
Registered Since: OCTOBER 2, 2018

Senior Vice President of Global Industry Services

QUALITY REGISTER


cqc

ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 00121E34970R3M/1100

We hereby certify that

Beijing Geo-Vista Technology Co., Ltd.

F1,2,3, Building 1, No.1 Huachang Road, Science and Technology Park, Changping District, Beijing, China

by reason of its

Environmental Management System

has been awarded this certificate for compliance with the standard

GB/T 24001-2016 / ISO 14001:2015

The Environmental Management System Applies in the following area:

Design, Development and Assembly of Wireline Logging Equipment and MWD/LWD Equipment, the Technical Services with Wireline Logging and MWD/LWD and Related Management Activities

Certified since: February 7, 2013 Valid from: December 6, 2021 Valid until: February 4, 2025

IAF CNAS IQNet

CHINA QUALITY CERTIFICATION CENTRE

A 0032910


cqc

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 00121S33690R3M/1100

We hereby certify that

Beijing Geo-Vista Technology Co., Ltd.

F1,2,3, Building 1, No.1 Huachang Road, Science and Technology Park, Changping District, Beijing, China

has been awarded this certificate for compliance with the standard

GB/T 45001-2020 / ISO45001:2018

The Occupational Health and Safety Management applies in the following area:

Design, Development and Assembly of Wireline Logging Equipment and MWD/LWD Equipment, the Technical Services with Wireline Logging and MWD/LWD and Related Management Activities

Certified since: March 11, 2013 Valid from: December 6, 2021 Valid until: December 5, 2024

IAF CNAS IQNet

CHINA QUALITY CERTIFICATION CENTRE

A 0032956


cqc

QUALITY MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 00121Q311620R3M/1100

We hereby certify that

Beijing Geo-Vista Technology Co., Ltd.

F1,2,3, Building 1, No.1 Huachang Road, Science and Technology Park, Changping District, Beijing, China

by reason of its

Quality Management System

has been awarded this certificate for compliance with the standard

GB/T 19001-2016 / ISO 9001:2015

The Quality Management System Applies in the following area:

Design, Development and Assembly of Wireline Logging Equipment and MWD/LWD Equipment, the Technical Services with Wireline Logging and MWD/LWD

Certified since: February 9, 2013 Valid from: December 6, 2021 Valid until: February 7, 2025

IAF CNAS IQNet

CHINA QUALITY CERTIFICATION CENTRE

A 0032840


IQNet

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

CQC has issued an IQNet recognised certificate that the organization:

Beijing Geo-Vista Technology Co., Ltd.

F1,2,3, Building 1, No.1 Huachang Road, Science and Technology Park, Changping District, Beijing, China

has implemented and maintains an

Environmental Management System

for the following scope:

Design, Development and Assembly of Wireline Logging Equipment and MWD/LWD Equipment, the Technical Services with Wireline Logging and MWD/LWD and Related Management Activities

which fulfils the requirements of the following standard:

GB/T 24001-2016 / ISO 14001:2015

Issued on: December 6, 2021

Expires on: February 6, 2025

Registration Number: CN00121E34970R3M/1100

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IQNet

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

CQC has issued an IQNet recognised certificate that the organization:

Beijing Geo-Vista Technology Co., Ltd.

F1,2,3, Building 1, No.1 Huachang Road, Science and Technology Park, Changping District, Beijing, China

has implemented and maintains an

Occupational Health and Safety Management System

for the following scope:

Design, Development and Assembly of Wireline Logging Equipment and MWD/LWD Equipment, the Technical Services with Wireline Logging and MWD/LWD and Related Management Activities

which fulfils the requirements of the following standard:

GB/T 45001-2020 / ISO45001:2018

Issued on: December 6, 2021

Expires on: December 5, 2024

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IQNet

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

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Beijing Geo-Vista Technology Co., Ltd.

F1,2,3, Building 1, No.1 Huachang Road, Science and Technology Park, Changping District, Beijing, China

has implemented and maintains a

Quality Management System

for the following scope:

Design, Development and Assembly of Wireline Logging Equipment and MWD/LWD Equipment, the Technical Services with Wireline Logging and MWD/LWD

which fulfils the requirements of the following standard:

GB/T 19001-2016 / ISO 9001:2015

Issued on: December 6, 2021

Expires on: February 7, 2025

Registration Number: CN00121Q311620R3M/1100

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