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Antonoil Integrated Drilling Service Introduction

东方智慧 全球分享

Oriental wisdom , Global sharing

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Drilling IPM Capability Introduction

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Anton integrated Drilling Services Division mainly engages in integrated drilling and single drilling service. Since established in 2009, has completed more than 30 integrated drilling service , more than 70 single drilling service . The customer satisfaction is more than 95% .

Service Introduction：

From the target block or single technology, based on fundamental research of regional and single well, integrate advanced technology at home and abroad, optimize drilling and completion plan, design drilling and completion engineering, decompose target and control quality, achieve efficient operation and effective management of overall project , reduce farthest the workload and management difficulty of the customer.

Drilling IPM Capability Introduction

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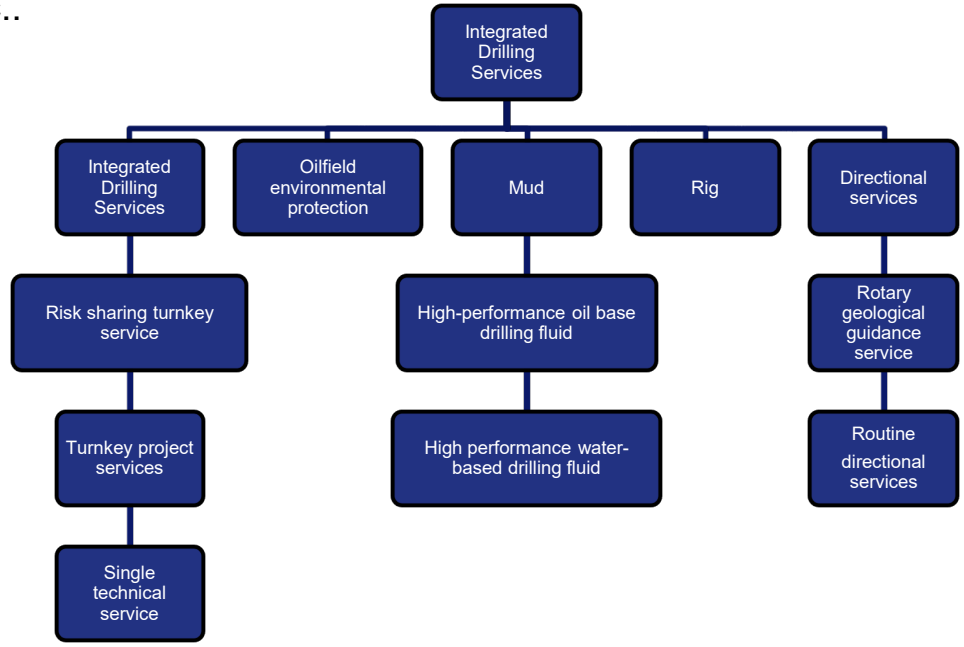
- With substantial geological , drilling experts, engineers, senior engineers accounted for 60%
- Advanced design ability, strong ability of resources integration, the first company of undertaking integrated service in China
- With 8 rigs, including 3 sets of ZJ50LDB, 2 sets of ZJ50DB, 1set of ZJ50L, 2 sets of ZJ70DB，managed 25 sets rigs at the same time.
- The largest private oil-base mud service company in China, the forerunner of the application of oil-base mud in Chinese land market
- 77 sets of LWD/MWD tools, 3 sets of rotary steering tool, 17 service teams
- 6 sets of water based mud not landing equipment, 3 sets of Oil based centrifugal equipment, 1 set of Water treatment terminal equipment

Service Mode:

Can provide integration services of drilling, completion and production for vertical and horizontal wells of different well types（exploration well，development well）and different depths（Shallow well, medium-deep well, deep well and ultra-deep well ）. Applications include CO_2 injection experiment well and horizontal well, multilateral well, sidetracking, horizontal connected wells , integration drilling of coal seam gas well. The service area includes Canada, Xinjiang, Daqing , Changqing , Sulige , Hubei, Yumen, yanchang etc..



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Characteristic Technology and Experience

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IPM technology characteristics

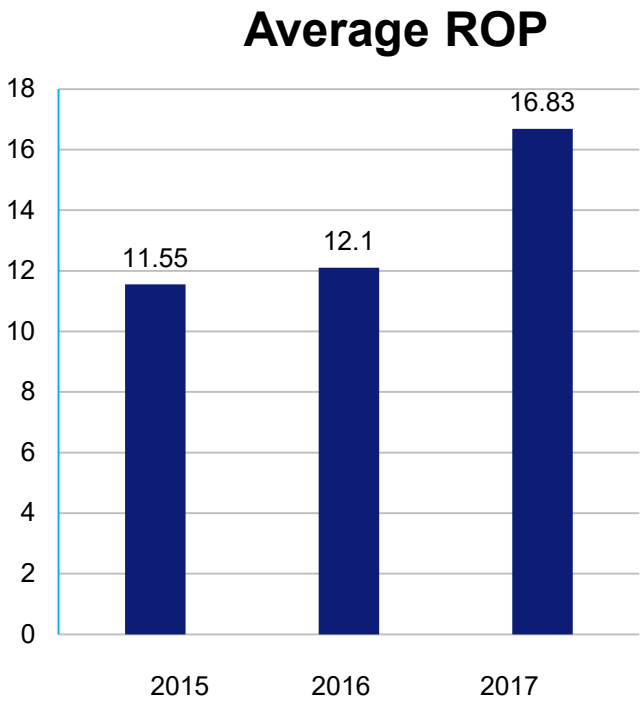
- Tight oil and gas drilling and completion techniques
- Drilling and completion of dual - branch Well
- Drilling and completion technology for shale gas Wells
- Drilling and completion techniques for windowed side Wells
- CBM well drilling and completion technology
- Gas storage well drilling and completion technology

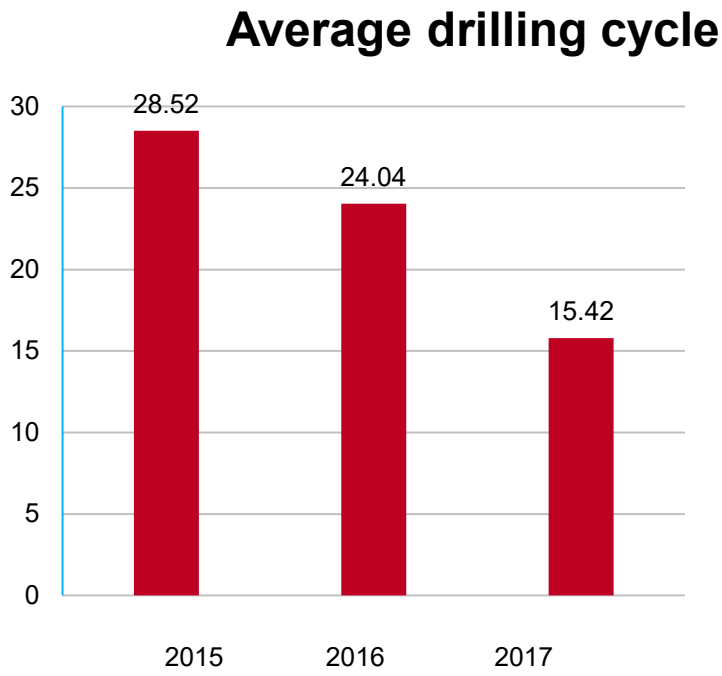
1、Tight oil and gas drilling and completion techniques

Since 2012, Anton has been engaged in tight oil and gas drilling general contracting services in Sulige, Mahu, Yanchang and northern Jiangsu. It has made use of horizontal Wells, branch Wells, sidewells, directional Wells, etc. to extract oil. It has made use the techniques suh as RSS, strong inhibition and plugging drilling fluid, elastic cement slurry and other technologies to form a series of tight oil and gas drilling and completion technologies.

Northern Jiangsu Turnkey	Drilling, mud and horizontal well orientation scheme and field service, providing high build slope rotary guide system and resistivity imaging, imported PDC, screw and other complete set of construction ; The drilling depth was 4475m, and the drilling encounter rate of 1.5m thin oil layer in 860m horizontal section was 94.6%.After fracturing, 7 to 11 tons of oil is injected from the well per day, making it the most productive well in the block
Sulige drilling Turnkey	In 2015, Anton entered sulige (average well depth 3,600m). Through drilling bit optimization, drilling tool combination optimization and drilling template formulation, the drilling efficiency has been continuously improved. In 2017, compared with other units, the mechanical drilling speed has been increased by 35.62% (12.41-16.83), and the drilling cycle has been shortened by 33.93% (23.34-15.42).

1、Tight oil and gas drilling and completion techniques/Sulige drilling Turnkey

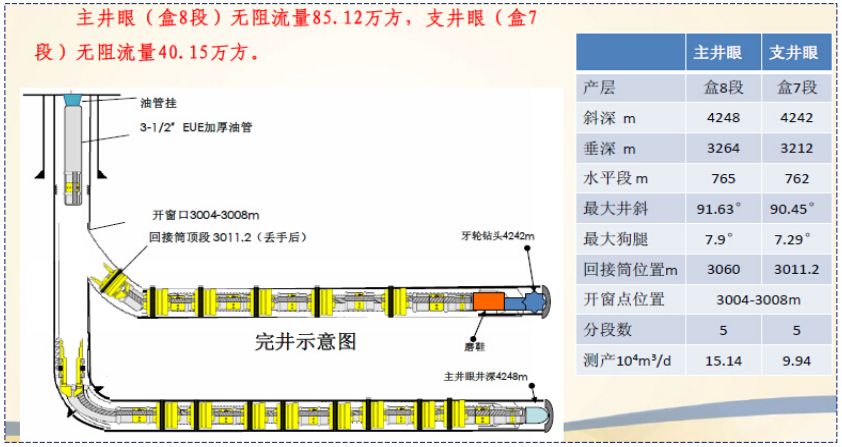




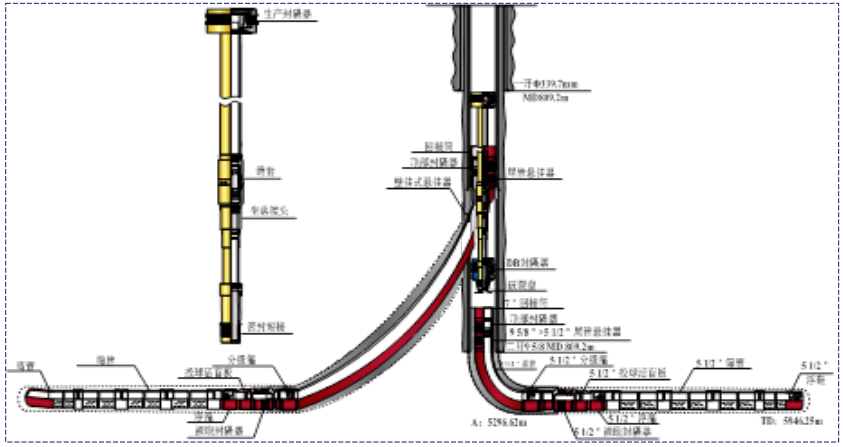
- Average ROP 16.83m/h, higher than 2016 by 39.09% ,higher than 2015 by 45.71%
- Drilling cycle is dramatically shortened, From 28.52 days in 2015, it has been shortened to 15.42 days, 13.1 days, and increased by 85%

2、Drilling and completion techniques of dual - branch Well

since 2011 Anton began to overtake drilling turnkey in dense oil and gas wells in Tarim . from solution proposed - - horizon optimization - trajectory optimization - design - to organize and implement (drilling, fracturing, gas), application of vertical well drilling, rotary steering and leakage prevention collapse, dual density drilling fluid technology, such as ductile slurry system integration service turn-key project, efficient finish 2 branch Wells construction, formed a series of branch well drilling, well completion technology.



	主井眼	支井眼
产层	盒8段	盒7段
斜深 m	4248	4242
垂深 m	3264	3212
水平段 m	765	762
最大井斜	91.63°	90.45°
最大狗腿	7.9°	7.29°
回接筒位置m	3060	3011.2
开窗点位置	3004-3008m	
分段数	5	5
测产$10^4m^3/d$	15.14	9.94



※ **Sulige:** The first "branch horizontal well + staged fracturing" construction, the realization of two-layer staged fracturing composite mining, equivalent to the development effect of 10 straight Wells in China

※ **Tarim:**The daily oil production of the upper and lower branches of a double-step horizontal well totaled 185 cubic meters/day, setting a record in this area

3、Drilling and completion technology for shale gas Wells

Anton began to entry into zhejiang oil shale gas market since 2014 and entry into the changning district shale gas market in 2017, after recent years of exploration and accumulation, Anton uses the technology of the integrated application of rotary steering, biological synthetic based drilling fluid, elastic slurry, rotating casing running, twist ,etc. Forming the design of ROP improving in Changning district

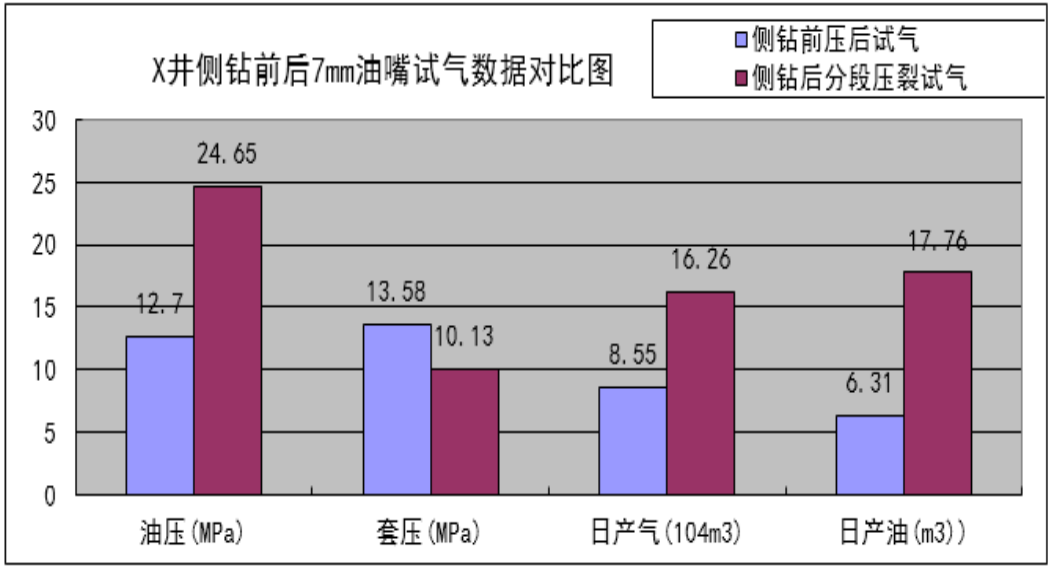
- The drilling cycle of well X in changning is 51.19 days. The shortest index of drilling and completion cycle for Wells above 5000m in block ning 209 of changning shale gas is refreshed (currently, the average drilling cycle in block ning 209 is 75 days, and the drilling and completion cycle is 88 days).
- Drilling penetration (3071-5100 meters, 2029 meters) in the deflecting section and horizontal section of the 215.9mm hole by using the rotary guide.
- 平In the 311.2mm well, a single PDC bit was drilled 1165m, the pure drilling time was 104.5h, the average mechanical drilling speed was 11.15m/h, and the working area took the lead

4、Drilling and completion techniques for windowed side Wells

Since 2009, Anton has carried out the total outsourcing service of casing side drilling for small hole in xinjiang, daqing, yanchang and other regions. So far, 13 Wells have been popularized and applied, and all of them have been successful, with the output increased 3-5 times, providing a good solution for the industrial exploitation of long shut-down Wells and low efficiency Wells in the low efficiency area, and the recovery rate increased.

■ major technology (Yanchang)

- Borehole trajectory retest technology in casing well
- Technology of orienting setting for gyroscope of whipstock
- Casing forging/milling window opening technology
- Directional horizontal drilling technology for small hole sidetracking
- Lateral drilling of short radius horizontal well with open window
- Lateral drilling of directional well with controlled pressure

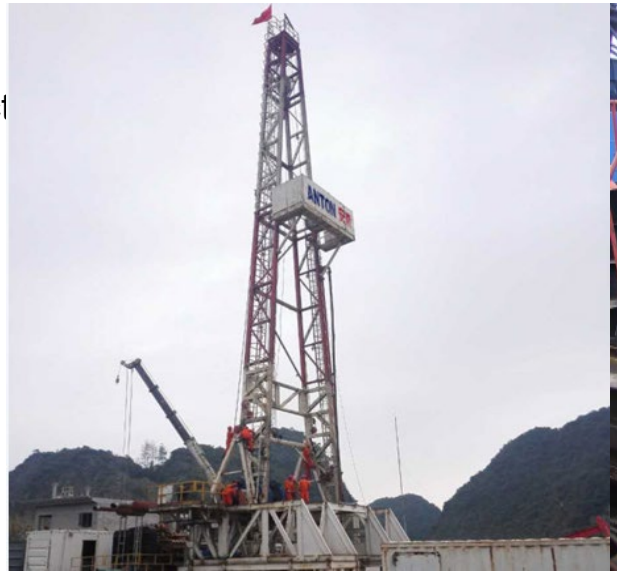


5、Coalbed methane (CBM) well drilling technique

Since Y2011, Anton has drilled 15 Coalbed me Well bore quality, cementing quality pass rate reached 100% Well bore quality, cementing quality pass rate reached 100%thane (CBM) wells in Daqing, Liupanshui etc. especially, 24 wells have been drilled in Liupanshui(China), The average ROP, drilling cycle constantly refreshed the area′ s record, Well bore quality, cementing quality qualified ratio are 100%

■ Main technology

- Slot distribution and traject optimization
- Air drilling
- bit optimization
- efficient loss remedy
- factory operation
- Borehole wall stabilization

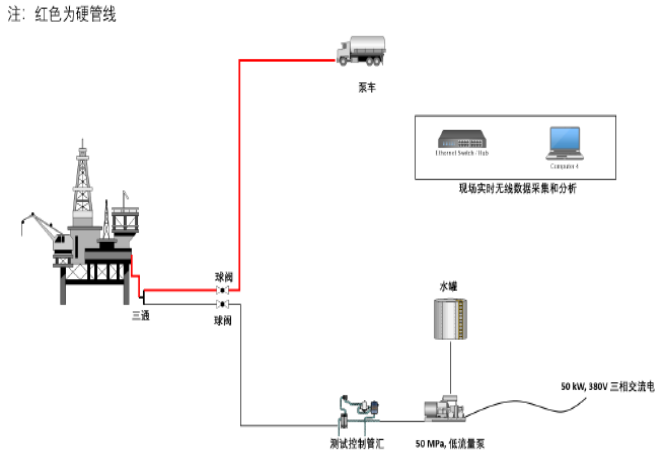


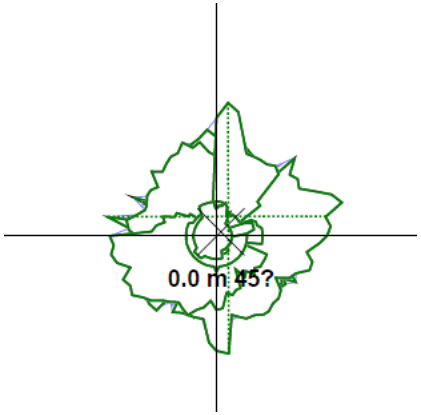
6、Salt dome gas storage well drilling and completion technique

In 2018, Anton successfully conducted gas storage well drilling and completion project, Well bore quality, cementing quality qualified ratio reached 100%

■ Main technology

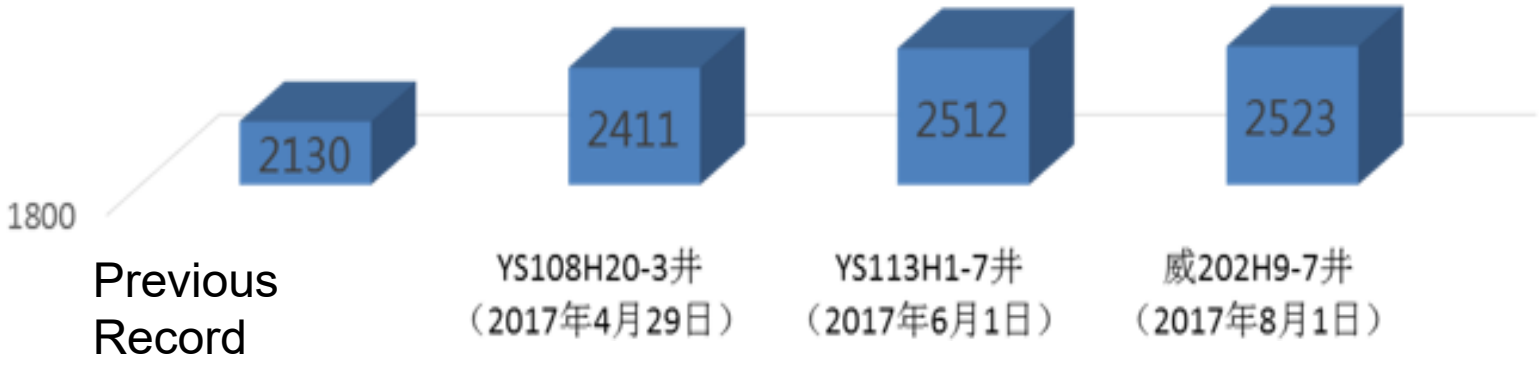
- Salt dome drilling
- sonar cementing quality technology
- cavity measurement technology
- gas seal testing technology
- In-situ stress measurement technology
- MIT testing technology





7、Geo-steering RSS

In 2009 Anton initiatively bring RSS into the land drilling operation on mainland of china. we own 3 sets of RRS tools.Up to now, accumulatively service 100 wells. Deepest drilling depth: 7729.8 m(YB103H), Fasted daily footage:365 m(Daqing), break the longest length record of horizontal interval of shale gas well in china by three consecutive times.



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THANKS!

Helping others succeed…

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