Antonoil Coiled Tubing Service
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Anton CT branch establish in 2009, the headquarter is located in Sichuan province. It’s wholly-owned subsidiaries by Antonoil group. Anton CT branch is an earliest private CT service company in China which hold totally 11 sets of CTU. 6 sets in domestic of China the other 5 in Iraq. All these equipment were manufactured by HydraRig, NOV, Canada.
Overview--Market

China: All gas and oil field located in China

Clinet: CNPC, Sinopec, CNOOC, Shell, TOTAL, AAGI, EOG

Overseas: Iraq Al-Waha, Hafaya, SOC

Clinet: CNPC, Lukoil
Overview—Market in Iraq

Service for Oilfields:
- Ahdeb Oilfield
- Halfaya Oilfield
- Buzurgan Oilfield
- Badra Oilfield
- Garraf Oilfield
- West Qurna-2 Oilfield

Will start:
- East Baghdad Oilfield
- Mansuriya Oilfield
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东方智慧 全球分享
Oriental wisdom, Global sharing
## Capability for Service-Equipment

### CTU

<table>
<thead>
<tr>
<th>NO.</th>
<th>Equipment</th>
<th>Injector</th>
<th>BOP</th>
<th>Pressure</th>
<th>Crane</th>
<th>QT.</th>
<th>Location</th>
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<tbody>
<tr>
<td>1</td>
<td>CTU</td>
<td>HR660</td>
<td>3.06&quot;10M</td>
<td>70MPa</td>
<td>30t</td>
<td>3</td>
<td>China 1 set, 2009</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Iraq 2 sets, 2009</td>
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<tr>
<td>2</td>
<td>CTU</td>
<td>HR680</td>
<td>5.12&quot;10M</td>
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<td>50t</td>
<td>4</td>
<td>China 2 sets, 2014</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Iraq 2 set, 2014</td>
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<tr>
<td>3</td>
<td>CTU</td>
<td>HR6100</td>
<td>5.12&quot;10M</td>
<td>70MPa</td>
<td>50t</td>
<td>4</td>
<td>China 3 sets, 2015</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Iraq 1 set, 2014</td>
</tr>
</tbody>
</table>
Capability for Service-Equipment

700HP Pump Unit (11 sets)
- Max. pressure: 10,000psi
- Max rate: 1.07m³/min
- Piston size: 4”

1000HP Pump Unit (7 sets)
- Max. pressure: 10,000psi
- Max rate: 2.55m³/min
- Piston size: 5”
Capability for Service-Equipment

- **Nitrogen generator**
  - Max Pressure: 5,000psi
  - Max pumping rate: 1200sm3/hr
  - Nitrogen purity: 95 ~ 99%

- **Nitrogen pump 2sets**
  - Max Pressure: 10,000psi
  - Max pumping rate: 5097m3/hr

- **Liquid Nitrogen tank 4 sets**
  - 12~16m3/ea

- **Liquid nitrogen pump and tank**
Capability for Service-Equipment

- Mixing Pump
- Acid and water tank
  - 40m³ /ea
  - 60 sets
Capability for Service-Equipment

Other auxiliary Equipment

Injector

BOP

Stripper

Lubricator

Working reel

Yard spooling unit
## Capability for Service-Coil string

<table>
<thead>
<tr>
<th>No.</th>
<th>OD</th>
<th>L(m)</th>
<th>Wall thickness(in)</th>
<th>Rated pressure</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>1 1/4&quot;</td>
<td>5200/6900/7000</td>
<td>Taper 0.109&quot;,0.116&quot;; 0.125&quot;,0.134&quot;,0.145&quot;,0.156&quot;</td>
<td>70MPa</td>
<td>HS-90抗H2S</td>
</tr>
<tr>
<td>2</td>
<td>1 1/2&quot;</td>
<td>5000/5400/6500</td>
<td>Taper 0.125&quot;;0.134&quot;; 0.145&quot;; 0.156&quot;;0.175&quot;</td>
<td>70MPa</td>
<td>HS-80抗H2S</td>
</tr>
<tr>
<td>3</td>
<td>1 3/4&quot;</td>
<td>3500/5000/6500</td>
<td>0.175&quot;</td>
<td>70MPa</td>
<td>HS-90抗H2S</td>
</tr>
<tr>
<td>4</td>
<td>2&quot;</td>
<td>5000/5500/5900</td>
<td>0.175~0.204&quot;</td>
<td>70MPa/105MPa</td>
<td>HS-110</td>
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<tr>
<td>5</td>
<td>2 3/8&quot;</td>
<td>3100</td>
<td>0.145&quot;</td>
<td>70MPa</td>
<td>HS-80抗H2S</td>
</tr>
</tbody>
</table>

E-coil : 1.75“ 4200m及5000m, 2” 5000m&5500m
Capability for Service-Downhole tools

Down hole tools for Stage frac with packer

Down hole tools for E-coil and coil with Fiber
Capability for Service-Downhole tools

Down hole tools for Milling job

Down hole tools for Fishing job
Capability for Service-Downhole tools

Other auxiliary tools
Capability for Service-Service bases

Anton Service Bases in Iraq

1) **MDOC- Ahdeb Service Base:**
   - Service date: Sep, 2010
   - Construction area: $4 \times 10^4$ m$^2$

2) **MOC- Halfaya Service Base**
   - Service date: Dec, 2011
   - Construction area: $6 \times 10^4$ m$^2$

3) **SOC- WQ-2 Service Base**
   - Service date: Dec, 2013
   - Construction area: $4 \times 10^4$ m$^2$

4) **MOC- Buzurgan Service Base**
   - Service date: Jan, 2014
   - Construction area: $2 \times 10^4$ m$^2$
Anton Service Bases in China

1) Suining Service Base:
   Service date: Sep, 2010
   Construction area: $4 \times 10^4$ m$^2$

2) Chengchuan Service Base
   Service date: Dec, 2013
   Construction area: $2 \times 10^4$ m$^2$

3) Xinjiang Service Base:
   Service date: Dec, 2018
   Construction area: $1 \times 10^4$ m$^2$
R & D Center

Anton has established researching & developing center of new chemical technologies for oilfield utilization. Our own advanced laboratory facilities and factory to supply strong guarantee to develop, produce and evaluate oilfield chemicals.
## Capability for Service-Employees

<table>
<thead>
<tr>
<th>No.</th>
<th>position</th>
<th>Average field experience</th>
<th>Qty.</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Specialist</td>
<td>18 years</td>
<td>6</td>
<td>Bachelor</td>
</tr>
<tr>
<td>2</td>
<td>Engineer</td>
<td>8 years</td>
<td>30</td>
<td>Bachelor</td>
</tr>
<tr>
<td>3</td>
<td>Supervisor (including HSE)</td>
<td>6 years</td>
<td>10</td>
<td>Junior college</td>
</tr>
<tr>
<td>4</td>
<td>Captain</td>
<td>8 years</td>
<td>11</td>
<td>Junior college</td>
</tr>
<tr>
<td>5</td>
<td>Chief operator</td>
<td>6 years</td>
<td>15</td>
<td>Junior college</td>
</tr>
<tr>
<td>6</td>
<td>Assistant operator</td>
<td>4 years</td>
<td>40</td>
<td>high school</td>
</tr>
<tr>
<td>7</td>
<td>helper</td>
<td>3 years</td>
<td>20</td>
<td>high school</td>
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Service management

Certification: ISO9001/OHSAS 18001/ISO 14001 and HSES Certification
Service management

CTU inspection

Our equipment, pipe line, Lubricator, Adapter, swivel valve, plug valve and slick line are regular inspected by BV-Fairweather or other specific inspection agency.

Also we keep maintenance record.
Before each job we will apply Cerberus to simulate force condition and calculate hydraulic parameter in a well to guide our job.

Our data acquisition system is produced by NOV, which can record flow rate, circulation pressure and CT depth.

Also it will record the Fatigue Life of every string, so that we can track the life time of CT string.
Subject: Performance Certificate of Antonoil Stimulation in Halfaya Oilfield

Dear Sir,

PetroChina awards this letter to Antonoil for excellent performance in Stimulation service. Antonoil completed 13 wells of Coiled Tubing Stimulation and treated seven wells of Coiled Tubing Nitrogen lifting, two wells of Coiled Tubing downhole tools services and two wells of Coiled Tubing well washing. PetroChina hereby appreciates the performance of Antonoil for services abilities.

Dear Coiled Tubing Team,

2015 year is almost over, and it is time to look back and evaluate our performance. We did a lot of interventions this year and I could assess the overall performance of CT team as very good.

Through all the year we saw professional attitude of CT staff to their duties! With great spirit and discipline, Coiled Tubing team performed well intervention operations in a safe professional manner.

We highly appreciate both management and team efforts to improve SQ and HSE of stimulation project in 2015. The key indicator of such endeavors is zero SQ and accident in 2015.

We are looking forward to CT team continuous efforts in improving well intervention services at high level of performance on our project in the future.

Best regards,

Alexander Sorokin
Workover & Rigless Supervisor
Well Operations Superintendent Service
LUKOIL Mid East Ltd.
West Qurna-3 Project, Iraq

Yours sincerely,

PetroChina Halfaya Well Service Department

ANTON

致：安东石油国际公司

安东石油国际公司自今年年初参加中石油公司伊拉克AHDEB油田项目以来，在完成井作业及酸化压裂技术服务方面，与中石油公司努力配合，成果显著，整体团队认真踏实的工作态度和严谨的工作作风也受到了中石油公司领导和相关部门的一致好评。

在完井技术服务方面，安东石油国际公司负责完成了17口井的生产完井作业，达到了100%的施工成功率，为公司今后在该区域市场树立了良好的品牌形象，质保期在规定时间内无法如期到达的情况下，连续工作长达9个月，并始终保持高效的工作效率和高标准，受到了客户公司和相关方的高度评价。

在连续油管酸化技术方面，安东石油国际公司伊拉克分公司总经理乔安和现场技术人员克服困难，根据实际情况制定出合理的施工方案，取得了良好的施工效果，2015年在该油田的酸化施工中，取得了80%的施工成功率，得到客户和现场技术人员的一致好评。

我们期待在今后的工作中，与中石油公司的合作更加紧密，共同推动中东地区的石油勘探开发事业的发展，也为中石油公司的国际化进程做出更大的贡献。

安东石油国际公司
2010-12-17
Service management

QHSE Regular Training & Drill
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CT Application

- **CT milling job** (composite plug, alloy plug, Cement plug, ball sets, scale)
- **CT frac job** (stage frac with packer, sleeve)
- **E-coil service** (logging, perforating, plug setting, cutting)
- **CT acidizing** (drag acidizing, bullheading)
- **CT abrasive perforating** (perforating, cutting)
- **CT fishing** (wire line, fish, steel pipe, steel ball, debris)
- **CT isolation** (water isolate, Cementing, plug setting)
- **CT cutting job** (machanicle cutting, chemical cutting)
- **CT completion** (velocity string, 2-7/8” CT string completion)
- Multilateral well **re-entry** service
- Conventional service (**sand clean out, scale/wax removal, gas lift**)
CT Application

CT perforating

CT stage frac

CT gas lift

CT plug milling in shell gas
Service Jobs – more than 4000 jobs, which Anton CT Branch provided complete equipment and technology support.

<table>
<thead>
<tr>
<th>NO.</th>
<th>Service</th>
<th>Jobs since 2009</th>
<th>location</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>CT Acidizing service</td>
<td>2000</td>
<td>Iraq</td>
</tr>
<tr>
<td>2</td>
<td>Plug milling</td>
<td>150</td>
<td>China</td>
</tr>
<tr>
<td>3</td>
<td>CT Frac</td>
<td>90</td>
<td>China</td>
</tr>
<tr>
<td>4</td>
<td>E-coil logging</td>
<td>40</td>
<td>China</td>
</tr>
<tr>
<td>5</td>
<td>Plug setting</td>
<td>29</td>
<td>China</td>
</tr>
<tr>
<td>6</td>
<td>CT fishing</td>
<td>60</td>
<td>China</td>
</tr>
<tr>
<td>7</td>
<td>Sand clean out</td>
<td>450</td>
<td>China</td>
</tr>
<tr>
<td>8</td>
<td>Gas lift</td>
<td>300</td>
<td>China</td>
</tr>
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<td>9</td>
<td>Velocity string</td>
<td>600</td>
<td>China</td>
</tr>
<tr>
<td>10</td>
<td>Scale remove</td>
<td>230</td>
<td>China</td>
</tr>
<tr>
<td>11</td>
<td>Others/Other</td>
<td>40</td>
<td>China</td>
</tr>
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Job cases

- **Case 1 CT acidizing:** Deviated well (ADXX),
  - Acid volume: 80m³ self-diverting acid, flow rate: 200 ~ 350L/min.

**Before treatment:**
Choke size: 24/64", **1200 BPD**, WHP: 993psi

**After treatment:**
Choke size: 24/64", **2605 BPD**, WHP: 1413psi

**CTU acidizing job curves:**

![CT acidizing job curves](image-url)
Job cases

- **Case 2 CT plug milling**: Horizontal well (long ye XX),
  - **Depth**: 5800m; stages: 14; casing: 5.5in;
  - **Flowrate**: 400~450L/min;
  - **Composite plug** (average milling time 30min; one trip plug milling job)

![Mill condition comparation after job](image1)

![Plug debris](image2)
Job cases

- **Case 3 CT stage frac**: Horizontal well (xi ping XX),
- **Depth**: 3615m; stages: 40; casing: 5.5in; horizontal section 1529.7m
- **Frac flowrate**: 4 m³/min; **Total volume**: 24263 m³

![Specific operation curve](image)
Case 4  E-coil logging (coil with fiber) : Horizontal well (YS108HXX),
- Depth: 4288m ; casing: 5.5in; horizontal section 1560m
THANKS!
Helping others succeed...