

# **THE MATERIALS OF THE 10<sup>th</sup> INTERNATIONAL COILED TUBING AND WELL INTERVENTION CONFERENCE**

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# The Results of the 10<sup>th</sup> International Coiled Tubing and Well Intervention Conference

The 10<sup>th</sup> International Coiled Tubing and Well Intervention Conference took place in Moscow on September 16-18.

The Conference was organized by Nonprofit Partnership “Coiled Tubing Technologies Development Center”, Coiled Tubing Times Journal and the Intervention & Coiled Tubing Association ICoTA.

The day prior to the Conference was marked by 10-hour long short course “Coiled Tubing and Its Applications”. The key speaker was Honorary ICoTA member Ken Newman. The focus of the short course was on the following issues: surface equipment, downhole tools, coiled tubing (CT stresses, deformation factors, CT Mechanical limits, CT fatigues, CT hydraulics), coiled tubing applications, coiled tubing drilling technology.

The other two speakers of the short course were:

- S.A. Atrushkevich, representing CJSC Novinka “Underground Equipment for Directional Coiled Tubing Drilling”;
- S.V.Kablash, NOV Fidmash – “Control and Recording System”.

More than 60 people participated in the short course (*Supplement 1*), each of whom received the Certificate of Attendance and own copy of the short course materials. In essence, the printed workbook is in-depth reference on the basics of coiled tubing technology and its capabilities.

The conference was attended by about 150 participants representing more than 50 organizations. Among the attendees there were representatives of Russian oil and gas operators (Gazprom, Rosenft, Lukoil, TNK-BP etc.), Russian oilfield service companies (Integra, KT-Service etc.), as well as major international service companies (Schlumberger, Weatherford, Foremost etc.), coiled tubing equipment manufacturers (Fidmash, Global Tubing etc.), scientific institutions and the mass media.

The list of participants and short descriptions of the participating companies are provided. (*Supplements 2, 3*).

The two following days were split into several sessions. All in all the conference days were marked by as many as 30 reports.

## SESSION 1. COILED TUBING TECHNOLOGIES – PRACTICE AND OUTLOOK

1. *N.V.Rakbimov, Engineering Manager, OOO Gazprom Podzemremont Urengoi.*  
**“Experience of applying CT technologies for well service at Western Siberian fields”**
2. *K.V.Burdin, Business Development Manager, Schlumberger Logelco Inc “AbrasiFrac Technology”.*  
**“Significant Reduction of Cycle of Bringing New Wells into Production**

**at Priobskoe Oilfield of LLC Rosneft-Yuganskneftegas”.**

3. *Bernie Luft, Sr. Technical Consultant, Global Tubing, LLC.*

**“Improving Well Intervention Serviceability and Reliability Through Advancements in Coiled Tubing Manufacturing Technologies”**

4. *S.B. Beketov, Chief Research Worker, OOO NK Rosneft NTC.*

**“Integrally Designed CT Technology of Well Service and Production Enhancement under Low Pressure Conditions”.**

5. *S.A. Atrushkevich, Leading Designer, SZAO Novinka.*

**“New Production Enhancement opportunities”.**

6. *A.G. Molchanov, Engineering Mechanics Dept. Chairman, Gubkin State University of Oil and Gas.*

**“Load on Downhole Equipment during CT Well Workover”.**

7. *N.V. Kulinich, CT Senior Production Engineer, Schlumberger Logelco Inc.*

**“Coiled Tubing Fishing Operation on Logging Assembly with Cable for ZAO Achingaz, well A18-2”.**

8. *Mike Rossing, Global Business Unit Manager, Blake Hammond, Global General Manager, Weatherford.*

**“Success Story of Regaining Full Bore Access to Formation Using Thru Tubing Underreaming Technology”.**

9. *L.F. Davletshina, Senior teacher, Gubkin Russian State University of Oil and Gas.*

**“CT Technologies for BHT at Injection Wells”.**

10. *R.N. Saldeev, Project Manager, Schlumberger Logelco Inc.*

**“Testing and Using of Viscoelastic Polymer Free Self Diverting System VDA® on Wells of the Astrakhan Gas-Condensate Field”.**

## SESSION 2. COILED TUBING DRILLING

1. *Toni Miszewski, Managing Director, AniTech Ltd.*

**“Directional Coiled Tubing Drilling Experience with the New COLT Bottom Hole Assembly”.**

2. *A.V. Patalakba, Lead Coiled Tubing Engineer, Salym Petroleum Development H.B.*

**“Coiled Tubing Application in Exploration Drilling of Salym Oilfield”.**

3. *R.M. Akhmetshin, Engineer-in-chief, OOO Tatneft Aktubinsk Rem Service.*

**“The Experience of Applying CT technologies at the Fields of Tatarstan”.**

4. *Eric Boeke, Co-Chairman, ICoTA.*

**“ICoTA in Russia – New Opportunities for Russian Oil Workers”.**

## SESSION 3. COILED TUBING: OPERATING CONDITIONS, LOADING, FLUID FLOOR MECHANICS, BUCKLING AND LOCKUP, FATIGUE, STRENGTHENING

1. *Steven Tipton, Professor, Tulsa University.*

**“An Accelerated Coiled Tubing Testing Machine”.**

2. *E.L. Simanov, Lead Engineer, OAO Uraltrubmash.*  
**“Modernization of CT Production at OAO Uraltrubmash”.**
3. *E.N. Shtakbov, Deputy General Manager, OOO NPP RosTEKTechnologii.*  
**“Instruments for CT Operations”.**

#### SESSION 4. SURFACE EQUIPMENT, DOWNHOLE TOOLS

1. *S.V. Yurutkin, Head of Sales and Promotion Division, NOV Fidmash, S.V. Kablash, Deputy Chief Designer, NOV Fidmash.*  
**“Full Complex of Equipment for High-Technology Stimulation Operations”.**
2. *Ken Newman, Technical Director, NOV CTES.*  
**“Cost-Effective Capillary Tube Installation in Coiled Tubing”.**
3. *D.V. Vladyskin, Deputy Marketing Director, Industrial Group TEGAS.*  
**“Application of Nitrogen Pump Units in CT Technologies”.**
4. *A.A. Slobozhaninov, CT Lead Engineer, Schlumberger Logelco Inc.*  
**“Underbalanced Coiled Tubing Perforating and Well Test in a Single Trip”.**
5. *A.G. Molchanov, Chairman of Engineering Dept., V.G. Pevnev, Scientific Associate, Gubkin Russian State University of Oil and Gas.*  
**“Methods of Coiled Tubing Control at CT units in Operational Conditions”.**
6. *S.A. Shmonin, Sales and Marketing Dept. Manager, OAO Sibneftemash.*  
**“Semitrailer-Mounted Insulated Cleaning Unit for Coiled Tubing Well Completion (the “Potok” Unit)”.**  
*Abstracts of the reports are provided. (Supplement 4).*

One of the much talked-about issues of the Conference was shortage of modern equipment available to service companies, the kind of equipment that could enable to implement the most efficient technologies. It was pointed out that such equipment is simply not manufactured in Russia. After the thorough analysis of Conference discussions and the survey held by instruction of the government of the Russian Federation №IS-P9-1923 d.d 09.042009 the following conclusions can be drawn:

- the domestic market of service equipment manufacture is not highly regarded by industry experts, both with respect to quality and the range of products; there is evidence that the domestic market considerably lags behind its foreign counterparts with regard to some key aspects;
- Taking steps towards domestic manufacture development are seen as highly urgent and reasonable, whereas the equipment should be competitive enough to enable technological independence of Russian oil and gas industry.

As part of the Conference there was also a little exhibition with Weatherford, AnTech, NOV Fidmash, Global Tubing, Schlumberger and TEGAS booths.

In his conclusion, L.M. Hruzdilovich, the Chairman of CTTDC Academic Board informed the attendees that Nonprofit Partnership Coiled Tubing Technologies Development Centre would be empowered to function as Russian Chapter of ICoTA.

Conference day 3 ended with the ceremony of summing up the results of the Best Company at Applying Stimulation Technologies and Equipment Award. The ceremony took place on board a motorship cruising down the Moscow River.

The contest comprised six nominations. **The Coiled Tubing Drilling Application Award** was given to **OAO Surgutneftegas**; **OAO Tatneft** won in the **Advanced Stimulation Technologies Application nomination**; **Integra Group** was named the **Company with the Widest Range of Services Provided**; and the **Gasprom Podzemremont Urengoi** got the **Application of Advanced Well Workover and Servicing Technologies Award**. **The Quantity and Quality of Repair Operations Award** went to **OAO Rosneft Oil Company**. **Schlumberger** was acknowledged the **Best Foreign Company in the Russian Services Market**. The winners were awarded certificates and valuable gifts.

During the three day Conference participants had a wonderful opportunity to meet each other in person and share the experience of performing operations, learn about new technologies, decide on their needs for innovative equipment and establish business contacts. The organizers – NP CTTDC and Coiled Tubing Times Journal are planning to arrange the following conference under the aegis of the Ministry of Energy of the Russian Federation in September 2010 in Moscow.

*We want to thank all participants and invite you to take part in our next forum – the 11<sup>th</sup> Conference on Coiled Tubing and Well Intervention! Steering Committee.*

#### SUPPLEMENT 1

### THE LIST OF “COILED TUBING AND ITS APPLICATIONS” SHORT COURSE ATTENDEES

Ken Newman	ICoTA, NOV CTES
Garislav Agamalov	ZAO Uralneftegazprom
Vasily Arhireev	OOO Ural-Design PNP
Sergey Atrushkevich	CJSC Novinka
Rustem Akhmetzyanov	OOO Tatneft-AlmetjevskRemService
Rubin Akhmetshin	OOO Tatneft-AktubinskRemService
Viachaslau Baranau	Coiled Tubing Times Journal
Sergey Beketov	OOO NK Rosneft NTC

Yuri Belugin	SZAO Fidmash
Daria Boldakova	Gubkin Russian State University of O&G
Konstantin Burdin	Schlumberger
Alexander Volkov	OAo Zarubezhneft
Vladimir Golovinsky	OOO Gazpromneft-nefteservice
Galina Gromova	Gubkin Russian State University of O&G
Irina Gruzdilovich	Coiled Tubing Times Journal
Leanid Hruzdilovich	NP CTTDC
Ljutsia Davlteshina	Gubkin Russian State University of O&G
Victoria Dronova	NP CTTDC
Oksana Efanova	Gubkin Russian State University of O&G
Alesia Zhelezkova	Slant Catalogue / Oil&Gas Equipment Journal
Yuri Ikonnikov	ZAO Specialnoye konstruktorskoye byuro
Albert Islamov	ZAO Bashneftgeofizika, Ufa Geophysical Dept.
Sergey Kablash	NOV Fidmash
Elena Kazakova	Gubkin Russian State University of O&G
Valery Karasev	OOO Tegas – Krasnodar Compressor Plant
Anatoly Kireev	OOO Yugson-Service
Andrey Kobelan	TPP Lukoil Ukhtaneftegaz, OOO Lukoil-Komi
Mikhail Krivopuskov	Innovation Company NAFTAEKO
Dmitry Kryakvin	OOO TyumenNIIGiprogaz
Andrey Kuzmenko	Lukoil Overseas Service B.V., Moscow Branch
Nikolay Kulinich	Schlumberger
Denis Kystyshev	OOO TyumenNIIGiprogaz
Elena Lapotentova	NOV Fidmash
Maria Mazurenko	NP CTTDC

Andrey Mikheev	NOV Fidmash
Alexander Molchanov	Gubkin Russian State University of O&G
Vladimir Moroz	OOO Integra-Servisys
Vyacheslav Nikishev	OAO NK Rosenft
Alexander Novichkov	Newco Well Service
Alexander Patalakha	Salym Petroleum Development
Viktor Pevnev	Gubkin Russian State University of O&G
Aleksey Pestrikov	OAO NK Rosneft
Ivan Pirch	CJSC Novinka
Nikolay Rakhimov	OOO Gazprom podzemremont Urengoi
Svetlana Romanenko	Gubkin Russian State University of O&G
Ruslan Saldeev	Schlumberger
Tatiana Semkina	Coiled Tubing Times Journal
Oleg Serdukov	OAO ANK Bashneft
Alexander Slobozhaninov	Schlumberger
Alexander Sorokin	Schlumberger
Alexander Stetsuk	OOO Gazprom geofizika
Evgeny Tokarenko	OAO Motovilikhinskiye Zavody
Lumir Fetkulaev	Gubkin Russian State University of O&G
Aleksey Khoruzhko	Coiled Tubing Times Journal
Kirill Tsgoev	TPP Lukoil-Ukhtaneftgaz OOO Lukoil-Komi NSHU Yareganef
Segey Shmonin	OAO Sibneftemash
Vladimir Shurinov	NP CTTDC
Sergey Yurutkin	NOV Fidmash
Aleksey Yakovlev	Nord Imperial

## SUPPLEMENT 2

### LIST OF PARTICIPANTS

Schlumberger	Konstantin Burdin
Schlumberger	Alexander Sorokin
Schlumberger	Ruslan Saldeev
Schlumberger	Nikolay Kulinich
Schlumberger	Alexander Slobozhaninov
Schlumberger	Charles Miller
Schlumberger	Igor Chen
Global Tubing	Bernie Luft
Global Tubing	Bob Bunch
Global Tubing	Jacques Attie
NOV Fidmash	Elena Lapotentova
NOV Fidmash	Sergey Yurutkin
NOV Fidmash	Yury Belugin
NOV Fidmash	Andrey Mikheev
NOV Fidmash	Sergey Kablash
OOO Tegas – Krasnodar Compressor Plant	Valery Karasev
OOO Tegas – Krasnodar Compressor Plant	Svetlana Baykovskaya
AnTech	Antoni Miszewski
Coil Services B.V. (Nietherland)	Henri Niewold
Coil Services B.V. (Nietherland)	Arno Poppel
ICoTA	Allison Babin
ICoTA, NOV CTES	Ken Newman
ICoTA, Tenaris	Eric Boeke
National Oilwell Varco Downhole	Aleksey Anopov
Newco Well Service	Tom Brocklebank
Newco Well Service	Alexander Novichkov
Nord Imperial	Aleksey Yakovlev
NOV	Andrew Jenkinson
Tenaris	John Smith
Weatherford	Blake Hammond
Weatherford	Mike Rossing
Weatherford	Detlef Boss
OAO ANK Bashneft	Oleg Serdukov

Bashneftgeofizika, ZAO Ufa Department of Geophysical Works	Albert Islamov
Coiled Tubing Times Journal	Ron Clarke
Coiled Tubing Times Journal	Galina Bulyko
Coiled Tubing Times Journal	Olga Gabdulkhakova
Coiled Tubing Times Journal	Irina Gruzdilovich
Coiled Tubing Times Journal	Aleksey Khoruzhko
Coiled Tubing Times Journal	Viachaslau Baranau
Coiled Tubing Times Journal	Tatiana Semkina
OOO Gazprom VNIIGAZ	Viktor Nifantov
OOO Gazprom VNIIGAZ	Alexander Likhushin
OOO Gazprom VNIIGAZ	Aleksey Lyashenko
OOO Gazprom VNIIGAZ	Igor Shulyatikov
OOO Gazprom geofizika	Alexander Stetsuk
OOO Gazprom geofizika	Vladislav Vladimirov
OOO Gazprom neft shelf	Evgeny Bychkov
OOO Gazprom neft shelf	Pavel Vishnevsky
OAo Gazprom neft	Ivan Kashtanov
OAo Gazprom neft	Viktor Mosin
OOO Gazprom podzemremont Urengoi	Nikolay Rakhimov
OOO Gazpromneft-nefteservice	Vladimir Golovinsky
OAo Zarubezhneft	Alexander Volkov
OOO Integra-Servisy	Vladimir Moroz
ZAO KVS-International	Yury Kudryashov
Lukoil Overseas Services B.V., Moscow Branch	Andrey Kuzmenko
OAo Lukoil	Robert Ramazanov
OAo Lukoil	Valery Ogorodov
Lukoil-Ukhtaneftgaz, TPP OOO Lukoil-Komi NSHU Yareganeft	Kirill Tsgoev
Lukoil-Ukhtaneftgaz, TPP OOO Lukoil-Komi	Andrey Kobelan
The Ministry of International Affairs	Kirill Mikhaylov
OAo Motovilikhinskie Zavody	Evgeny Tokarenko
NAFTAeko Innovations Company	Evgenia Gritsenko
NAFTAeko Innovations Company	Mikhail Krivopuskov
Oil and Gaz Eurasia Journal	Elena Zhuk
CJSC Novinka	Ivan Pirsch

CJSC Novinka	Sergey Atrushkevich
OOO NPF Packer	Marat Nagumanov
OOO NPF Packer	Sergey Balyanov
OOO NPF Packer	Valery Maltsev
OOO Oil Field Technology Services Ltd.	Grigory Shopsha
OOO Oil Field Technology Services Ltd.	Viacheslav Gorobiychenko
Gubkin Russian State University of Oil & Gaz	Lumir Fetkulaev
Gubkin Russian State University of Oil & Gaz	Alexander Molchanov
Gubkin Russian State University of Oil & Gaz	Svetlana Romanenko
Gubkin Russian State University of Oil & Gaz	Viktor Pevnev
Gubkin Russian State University of Oil & Gaz	Elena Kazakova
Gubkin Russian State University of Oil & Gaz	Galina Gromova
Gubkin Russian State University of Oil & Gaz	Daria Boldakova
Gubkin Russian State University of Oil & Gaz	Ljutsia Davletshina
Gubkin Russian State University of Oil & Gaz	Oksana Efanova
OOO NK Rosneft NTC	Sergey Beketov
AOO NK Rosneft	Aleksey Pestrikov
AOO NK Rosneft	Viktor Bochkarev
AOO NK Rosneft	Rashid Sharipov
AOO NK Rosneft	Viacheslav Nikishov
OOO NPP RosTEKtehnologii	Evgeny Shtahov
OOO NPP RosTEKtehnologii	Aleksey Boyarkin
SalyM Petroleum Development	Alexander Patalakha
AOO Sibneftemash	Sergey Shmonin
AOO NGK Slavneft	Valery Litvinov
Slant Catalogue / Oil and Gas Equipment Journal	Alesia Zhelezkova
ZAO Specialnoe Konstruktorskoe Byuro	Yury Ikonnikov
OOO Tatneft-AktubinskRemService	Rubin Akhmetshin
OOO Tatneft-AlmetyevskRemService	Rustem Akhmetzyanov
OOO TNK-BP Management	Rahul Madarapu

OOO NPP RosTEKtehnologii	Denis Kustyshev
OOO NPP RosTEKtehnologii	Dmitry Kryakvin
OOO Ural-Design NPP	Vasily Arhireev
ZAO Uralneftegazprom	Garislav Agamalov
OAo Uraltrubmash	Andrey Brylkin
OAo Uraltrubmash	Evgeny Simanov
NP CTTDC	Leamid Hruzdzilovich
NP CTDC	Vladimir Shurinov
NP CTTDC	Viktoria Dronova
NP CTTDC	Maria Mazurenko
OOO Yugson-Service	Anatoly Kireev

### SUPPLEMENT 3

## INFORMATION ABOUT COMPANIES AND ORGANIZATIONS

OIL & GAS OPERATORS/REFINING COMPANIES		
1	<p><b>OAo Bashneft</b></p> <p>Ufa-45, Republic of Bashkortostan, 450045, Russia Tel: (3472) 90-9450, (3472) 90-9450, (3472) 60-5885 www.bn-rb.ru</p>	<p>Bashneft is a Russian oil operator with its production activities in Bashkortostan, Tatarstan and Orenburg Province. The amount of oil fields the company works at is more than 160. It also produces oil in 4 license areas in Khanty-Mansiyski Autonomous Okrug—Yugra. The company consists of around 40 structural subdivisions.</p>
2	<p><b>OAo Gazpromneft</b></p> <p>125 A, Profsoyuznaya Str., Moscow 117647, Russia. Tel: +7 (495) 777-3152, +7 (495) 777-3152 Fax: +7 (495) 777-3151 www.gazprom-neft.ru</p>	<p>Line of activity of Gazpromneft includes the following:</p> <ul style="list-style-type: none"> <li>- oil and gas production;</li> <li>- oilfield services;</li> <li>- oil refining;</li> <li>- marketing of petroleum products.</li> </ul> <p>Gazpromneft conducts business in the following regions: Khanty-Mansiyski Autonomous Okrug, Yamalo-Nenets Autonomous Okrug, Tomsk Oblast, Omsk Oblast, Chukotka Autonomous Okrug. Company's key refining facilities are located in Omsk, Moscow and Yaroslavl Oblasts.</p>

3	<p><b>OAO Lukoil</b></p> <p>Legal Address and the Headquarters: 11 Stretensky blvd., Moscow 101000, Russia Tel.: +7 (495) 627 4444, +7 (495) 627 4444 Fax: +7 (495) 625 7016 www.lukoil.ru</p>	<p>Lukoil is an international vertically integrated oil and gas company. Its primary activities are as follows:</p> <ul style="list-style-type: none"> <li>- oil and gas exploration and production;</li> <li>- petroleum products and petrochemicals;</li> <li>- sales of petroleum products.</li> </ul> <p>Company's key activities in the sector of oil and gas exploration and production are done in Russia. Its resource potential is concentrated in Western Siberia.</p>
4	<p><b>LUKOIL Overseas Holding Ltd.</b></p> <p>1 Bolshaya Ordynka Str., Moscow, 115035, Russia Phone: +7 (495) 933 17 04, +7 (495) 933 17 04 Fax: +7 (495) 933 18 00 e-mail: mail@lucoil-overseas.ru www.lukoil-overseas.ru</p>	<p>LUKOIL Overseas Holding Ltd. is a structural part of Lukoil and represents the company at the international oil and gas production market.</p>
5	<p><b>TPP Lukoil Ukhta Neftegaz, OOO</b></p> <p>LUKOIL Komi Tel.: +7 (8147) 5 80 92</p>	<p>TPP Lukoil Ukhta Neftegaz operates on the territory of Komi Republic. It is now developing 30 deposits of the Southern Group. The primary ones are Pashinskoe, Zapadno-Tebukskoye, Kyrtalskoye deposits and the unique Yaregskoye deposit which is developed through mining.</p>
6	<p><b>OAO NK Rosneft</b></p> <p>26/1 Sofiskaya Naberezhnaya, Moscow 115035 Russia. Tel: +7 (495) 777-44-22, +7 (495) 777-44-22 Fax: +7 (495) 777-44-44 e-mail: postman@rosneft.ru www.rosneft.ru</p>	<p>The key activities of Rosneft are as follows:</p> <ul style="list-style-type: none"> <li>- oil and gas exploration and production;</li> <li>- petroleum products and petrochemicals;</li> <li>- sales of petroleum products.</li> </ul> <p>Company's key activities in the sector of oil and gas exploration and production are done in the following regions: Western Siberia, Southern and Central Russia, Timan-Pechora, Eastern Siberia and the Far East. It is also running some projects in Kazakhstan and Algeria.</p>
7	<p><b>OAO NGK Slavneft</b></p> <p>4 Chetverty Lesnoi Pereulok, 125047 Moscow, Russia Tel.: (495) 787-8206 (495) 787-8206, Fax (495) 777-7317 e-mail: slavneft@slavneft.ru www.slavneft.ru</p>	<p>Slavneft has the capacity for completing the full production cycle – from exploration and petroleum products production to refining.</p> <p>Slavneft is empowered to carry out geophysical studies of deposits and oil and gas production in 39 license areas around Western Siberia and Krasnoyarsk Krai.</p>

8	<p><b>ZAO Uralneftegazprom</b></p> <p>Dzerzhinsky Ave. 2, Orenburg, Russia Tel /fax (3532) 732033, (3532) 367064 e-mail: ungp@mail.ru</p>	<p>Uralneftegazprom is hydrocarbon products manufacture. Its product line includes:</p> <ul style="list-style-type: none"> <li>- dry gas;</li> <li>- stable condensate mixed with oil;</li> <li>- multicomponent fraction of gas liquids;</li> <li>- sulphur;</li> <li>- fuel gas;</li> <li>- stabilization gases.</li> </ul>
9	<p><b>Nord Imperial</b></p> <p>www.imperialenergy.com www.imperialenergy.ru</p>	<p>Imperial Energy is a diversified company doing geological exploration and oil and gas production. It operates not only in Russia but also in CIS countries. Nord Imperial holds the license for exploration and petroleum products production in three license areas (69, 77 and 80), with total area of 7 500 sq.km. Two of them have been actively developed since 2007.</p>
10	<p><b>TNK-BP Management</b></p> <p>Postal &amp; Legal Address: Arbat Str. 1, 119019 Moscow, Russia, e-mail: company@tnk-bp.com Tel.: (495) 745-89-58, (495) 787-96-68</p>	<p>TNK-BP is a vertically integrated oil company having several producing, refining and sales companies within its frames both in Russia and Ukraine. The company's production assets are located mainly in Western Siberia (Khanty-Mansiyski Autonomous Okrug, Yamalo-Nenets Autonomous Okrug), Eastern Siberia (Irkutsk Oblast) and Volga-Ural Region (Orenburg Oblast). The key refining facilities are in Ryazan, Saratov, Nizhnevartovsk and Lisichensk (Ukraine)</p>
11	<p><b>OAO ZARUBEZHNEFT</b></p> <p>Building 1, 9/1/1 Armiansky pereulok, Moscow 101990, Russia Tel.: +7 (495) 748-65-00 Fax: +7 (495) 748-65-05 Phoneex: 113303 STEK RU e-mail: nestro@nestro.ru www.zarubezhneft.ru</p>	<p>Zarubezhneft carries out development and realization of complex exploration and well development projects abroad. It also runs infrastructure construction projects for oil industry as long as oil recovery programs. In addition, Zarubezhneft is equipment and materials supplier. The company has participated in more than 30 international projects. At the Russian market the company is noticeable for its geological exploration and petroleum products production project in the blocks of Central-Choreyversky Rise, located in Nenets Autonomous Okrug.</p>

12	<p><b>Salym Petroleum Development</b></p> <p>Novinsky Blvd. 31, "Novinsky Passage", 6th floor, 123242 Moscow, Russia Tel.: +7 (495) 518 97 20 Fax: +7 (495) 518 97 22 e-mail: info@spdnv.ru www.spdnv.ru</p>	<p>The Salym Project development of the Salym Group of oilfields is located in Khanty-Mansi Autonomous Okrug. The Salym oilfields include West Salym, Upper Salym and Vadelyp. Salym Petroleum Development N.V. holds licences for the development of the three Salym oilfields with the Licence Area totalling 2141.4 sq km.</p>
<b>OILFIELD SERVICE COMPANIES</b>		
13	<p><b>OOO Gazprom Podzemremont Urengoi</b></p> <p>8, Zheleznodorozhnaya Str., 629307, Novy Urengoi, Yamalo-Nenets Autonomous District, Russia. Tel.: (3494) 94-81-11 (3494) 94-81-11 Fax: (3494) 22-04-49 www.ugp.ru</p>	<p>Gazprom Podzemremont Urengoi encompasses the following types of activities:</p> <ul style="list-style-type: none"> <li>- well workover and production maintenance of wells, removing of underground equipment, modernization, reconstruction, re-equipment, abandonment and conservation of wells of all types owned by Gazprom and its subsidiaries and independent customers;</li> <li>- well development and stimulation;</li> <li>- operation of dangerously explosive, fire and chemically hazardous production facilities;</li> <li>- planning and conducting of drilling, well completion and well testing operations.</li> </ul>
14	<p><b>NAFTAECO</b></p> <p>Nagatinskaya Nanerezhnaya, 48/2 115470, Moscow, Russia, Prospekt Truda 111, 394019 Voronezh, Russia Tel.: +7 (4732) 47 01 01, +7 (4732) 47 01 01 e-mail: info@naftaeco.ru www.naftaeco.ru</p>	<p>NAFTAECO unites service companies and Pervomajskhim mash Plant. Key activities of NAFTAEKO are as follows:</p> <ul style="list-style-type: none"> <li>- well workover;</li> <li>- well stimulation;</li> <li>- squeeze jobs (cement, latex, polymers and other composite materials);</li> <li>- enhanced oil recovery;</li> <li>- well killing operations;</li> <li>- coiled tubing remedial work.</li> </ul> <p>The Plant manufactures cementing, acid treatment equipment, coiled tubing units and other.</p>
15	<p><b>OOO Tatneft Aktubinsk Rem Service,</b></p> <p>Industrial base, Kama-Ismagilovo, Almetievsky District, Republic of Tatarstan, Russia Tel.: (85573) 993-38 www.tnremservice.ru</p>	<p>Tatneft Aktubinsk Rem Service provides well workover services based on coiled tubing use and wireline and chemical container services. The key technologies are: rapid intervention method with wireline, casing pressure test with packer on wireline, placing of cement plugs</p>

		with bailer, well completion through swabbing. Wireline and chemical container services are provided for all Tatneft divisions engaged in well intervention activities.
16	<p><b>OOO Tanef Almetievsk Rem Service,</b></p> <p>Proizvodstvennaya Str. 2, Alemtievsk, Republic of Tatarstan, Russia Tel.: (8557) 31-82-46 (8557) 31-82-46 Fax: (8553) 45-12-81</p>	<p>Tanef Almetievsk Rem Service provides the following services: well workover and well intervention at the sites characterized by difficult geological formation composition and difficult climatic conditions.</p> <p>The scope of offered services:</p> <ul style="list-style-type: none"> <li>- well intervention;</li> <li>- management of oil deposits exploration;</li> <li>- flow stimulation;</li> </ul> <p>Special services:</p> <ul style="list-style-type: none"> <li>- well abandonment and re-abandonment;</li> <li>- bottom-hole deepening;</li> <li>- drilling of water supply wells;</li> <li>- accident elimination operations.</li> </ul>
17	<p><b>OOO Ural Design-PNP</b></p> <p>BPO, Nagorny, Kungur 617473, Perm Krai, Russia Tel/Fax: (34271) 60 175, (34271) 60 168, (34271) 60 237 e-mail: udpnptehno@mail.ru e-mail: udpnpggeo@mail.ru</p>	<p>Ural Design-PNP provides well workover services and formation stimulation services on production and injection wells of both new and mature deposits. The company is currently operating in Perm Krai, Udmurtia and Orenburg.</p>
18	<p><b>Coil Services B.V. (The Netherlands)</b></p> <p>Phileas Foggstraat 65 NL-7825 AL Emmen The Netherlands Fax: +31 591 668150 e-mail: info@coilservices.com www.coilservices.nl</p>	<p>The range of services Coil Services B.V. offers to the energy, salt mining and marine industries includes:</p> <ul style="list-style-type: none"> <li>- coiled tubing services;</li> <li>- capillary tubing services;</li> <li>- pumping services;</li> <li>- stimulation services;</li> <li>- nitrogen services;</li> <li>- engineering services.</li> </ul>
19	<p><b>Schlumberger</b></p> <p>5A, Ogorodnaya Sloboda LA, Moscow, 101000 Russia Fax: (495) 935-8780 www.slb.ru</p>	<p>Schlumberger supplies Petroleum Industry with the whole range of services:</p> <ul style="list-style-type: none"> <li>- geological prospecting and development;</li> <li>- drilling and measurement while drilling;</li> <li>- formation evaluation;</li> <li>- well service;</li> <li>- well completion and production control;</li> </ul>

		<p>- information technologies and consulting.</p> <p>The company is represented in more than 80 countries of the world.</p>
20	<p><b>Weatherford</b></p> <p>Chetverty Lesnoi Pereulok 4, Moscow 125047, Russia          Fax: +7 (495) 775-47-13          e-mail: reception.moscow@eu.weatherford.com          www.weatherford.ru</p>	<p>Products and services of Weatherford International Ltd. encompass the needs of each stage of well life cycle: drilling, evaluation, completion, production and workover.</p> <p>The list of services offered by the company in the field of production technologies includes the following: evaluation, directional drilling, control of formation pressure while drilling (CPD®), cased wells completion, expandable systems, intelligent completion technologies, production optimization and all major lifting technologies.</p>
21	<p><b>Newco Well Service</b></p> <p>Moscow          (495) 982-39-43          e-mail: newcoms@newcowell.ru          www.newcowellservice.com</p>	<p>Newco Well Service provides the following services:</p> <ul style="list-style-type: none"> <li>- hydraulic fracturing;</li> <li>- cementing;</li> <li>- coiled tubing;</li> <li>- acid treatment;</li> <li>- nitrogen treatment;</li> </ul> <p>Newco Well Service operates across the whole territory of Western Siberia, in Volga-Ural Region and Yamalo-Nenets Autonomous Okrug. The company is also represented in Kazakhstan and Ukraine.</p>
22	<p><b>Integra</b></p> <p>Vernadskogo Ave., 6          119311, Moscow, Russia          Tel.: +7 (495) 933 0621          +7 (495) 933 0621          Fax: +7 (495) 933 0622          e-mail: reception@integra.ru          www.integra.ru</p>	<p>Integra offers well workover and well intervention services. The scope of the services provided by Integra includes:</p> <ul style="list-style-type: none"> <li>- sidetracking;</li> <li>- squeeze jobs;</li> <li>- behind-the-casing-flow liquidation;</li> <li>- elimination of incidents with ESP, SRP and other pumps;</li> <li>- enhancing well productivity through hydrochloric and mud-acid treatment, casing re-perforation;</li> <li>- casing replacement or removal;</li> <li>- well renewal, well conservation and abandonment;</li> <li>- well development, swabbing.</li> </ul>

23	<p><b>ZAO KVS International</b></p> <p>Bolshaya Tulsкая 10, stroenie 9, 115191 Moscow, Russia. Tel: +7 (495) 231-28-69 Fax: +7 (495) 231-28-69 e-mail: ayashnev@calfrac.com avereshchaga@calfrac.com www.calfrac.com</p>	<p>The Company is oilfield services provider. The range of services includes: enhanced oil recovery by means of fracturing with subsequent bottom-hole cleaning and well completion with coiled tubing use; nitrogen well treatment, lost circulation treatment, paraffin and hydrate plugs removal, acid treatment.</p>
24	<p><b>Bashneftegeofizika, ZAO Ufa Department of Geophysical Works</b></p> <p>Maykopskaya 57, 450095 Ufa, Russia Tel.: +7(347) 2212722 e-mail: bng-uugr@ufacom.ru www.bngf.ru</p>	<p>The key activities of the company are:</p> <ul style="list-style-type: none"> <li>- exploration and additional exploration of oil and gas deposits by means of seismic acquisition with detonation of explosive and vibration method;</li> <li>- well survey and management of existing deposits development with wireline logging.</li> </ul>
<b>EQUIPMENT MANUFACTURERS</b>		
25	<p><b>Global Tubing</b></p> <p>501 Country Road 493 P.O. Drawer 2139 Dayton, TX 77565-2139 713.265.5000 (Office) 866.891.1142 (Toll free) 713.265.5099 (Fax) e-mail: info@global-tubing.com www.global-tubing.com</p>	<p>Global Tubing manufactures a wide selection of coiled tubing products. Size range from 3/4-inch to 5-inch OD, with wall thicknesses from 0.080 to 0.337 inches. Complete coiled tubing design, milling, testing, service and customer asset management are done in-house to assure high quality and service.</p> <p>Services provided:</p> <ul style="list-style-type: none"> <li>- spooling;</li> <li>- welding;</li> <li>- hydrotesting;</li> <li>- installation;</li> <li>- preventative maintenance.</li> </ul>
26	<p><b>OAO Motovilikhinsky Plant</b></p> <p>Ulitsa 1905 Goda 35, 614014 Perm, Perm Krai, Russia Tel./ fax: +7 (342) 260-73-01, +7 (342) 260-73-01 www.mz.perm.ru</p>	<p>Motovilikhinskiye zavody includes engineering facilities manufacturing particularly oil field equipment.</p> <p>Oil field equipment:</p> <ul style="list-style-type: none"> <li>- drilling tools;</li> <li>- well workover equipment;</li> <li>- oil production equipment.</li> </ul>
27	<p><b>CJSC Novinka</b></p> <p>Rybalko str., 26, Minsk, 220033, Republic of Belarus Tel.: + 375 17 298 40 81, +375 17 248 30 93 e-mail: info@fidnov.by www.fid.by</p>	<p>Novinka specializes in manufacture of oil field equipment for stimulation of production by means of completion and directional drilling technologies. Novinka products are downhole equipment designed for use as part of modern coiled tubing complexes and equipment for directional drilling with roll pipes.</p>

28	<p><b>OAo NPF Packer,</b></p> <p>Severnaya Str. 7, 452606 Oktyabrsky, Republic of Bashkortostan, Russia Tel.: (34767) 6-63-64, (34767) 6-71-91 www.npf-paker.ru</p>	<p>Packer designs and manufactures packer and anchor equipment and well assemblies for completion, stimulation and workover operations as well provides services of equipment maintenance, rig-up and repair.</p>
29	<p><b>Uraltrubmash</b></p> <p>Novorossiyskaya, 30 454139 Cheliabinsk, Russia Tel.: (351) 734-73-77 (351) 734-73-77 Fax: (351) 734-73-72 e-mail: utbm@utbm.ru www.utbm.ru</p>	<p>Uraltrubmash manufactures coiled tubing for the following operations:</p> <ul style="list-style-type: none"> <li>- paraffin, hydrate and sand deposits elimination;</li> <li>- near-wellbore treatment;</li> <li>- geophysical surveys;</li> <li>- placing of cement plugs;</li> <li>- water shut off.</li> </ul>
30	<p><b>NOV Fidmash</b></p> <p>Rybalko str., 26, Minsk, 220033, Republic of Belarus Tel. + 375 17 298 24 17 Fax. + 375 17 248 30 26 e-mail: fidmashsales@nov.com fidmash@nov.com www.fidmashnov.com</p>	<p>The key line of Fidmash activity is design and manufacture of oil field equipment including that employing coiled tubing (equipment for well workover and directional drilling), whole units and separate components for hydraulic fracturing, auxiliary equipment (for enhanced oil recovery and directional drilling).</p>
31	<p><b>National Oilwell Varco Downhole</b></p> <p>Bolshaya Tatarskaya St., 42 Moscow 115184, Russia Tel.: 7 (495) 9814563 Fax: 7 (495) 9814564</p>	<p>National Oilwell Varco Downhole services the industry with a complete range of downhole tools and equipment. NOV Downhole designs, manufactures and provides customer service for all BHA components and also delivers complete-cycle solutions to all well intervention problems.</p>
32	<p><b>AnTech, Ltd.</b></p> <p>Unit 7, Newbery Centre, Airport Business Park, Exeter.EX5 2UL. United Kingdom. Tel: +44 (0) 1392 440300 Fax: +44 (0)1392 440 301 e-mail: antech@antech.co.uk www.antech.co.uk</p>	<p>AnTech offers electro-mechanical tools and equipment which enhance effectiveness and enable safer coiled tubing operations. Additionally, AnTech offers data acquisition and transmitting systems designed specifically for coiled tubing operations in hazardous areas.</p>
33	<p><b>National Oilwell Varco (NOV)</b></p> <p>7909 Parkwood Circle Dr. Houston, TX 77036 Tel.: 713 375 3700 1 888 262 8645 www.nov.com</p>	<p>National Oilwell Varco is a multinational corporation based in Houston, Texas uniting more than 100 brands and products. NOV manufactures land-based and offshore oil drilling rigs as well as all the major mechanical components for such rigs. Partial list of heavy hardware</p>

		includes topdrives, rotaries, drawworks, derricks, blowout preventers, mud pumps. NOV has a wide distribution network of over 200 locations.
34	<p><b>CTES NOV</b></p> <p><a href="http://www.nov.com/ctes">www.nov.com/ctes</a></p>	<p>NOV CTES offers:</p> <ul style="list-style-type: none"> <li>- Data acquisition systems;</li> <li>- specialized monitoring sensors;</li> <li>- advanced coiled tubing (CT) monitoring devices;</li> <li>- modeling software for intervention, drilling, and completion;</li> <li>- product engineering;</li> <li>- engineering consulting services.</li> </ul>
35	<p><b>Tenaris</b></p> <p>Moscow, Tenaris Global Services S.A. Voznesenskiy Lane 20, Stroyenie 3 103009 Moscow Tel.: +7 495 502 16 30 <a href="http://www.tenaris.com">www.tenaris.com</a></p>	<p>Tenaris is a supplier of tubes and related services for the world's energy industry and certain other industrial applications. Tenaris offers the following products to oil &amp; gas industry:</p> <ul style="list-style-type: none"> <li>- delivery pipes for pipelining and refining, specialized high-strength pipes, pipes made to order;</li> <li>- special alloy equipment such as gun perforators, protective cable sheath;</li> <li>- oil country tubular goods including, casing strings, tubing, coiled tubing and flexible tubing.</li> </ul>
36	<p><b>OOO Yugson Service</b></p> <p>3-149, Moskovsky Trakt, Tyumen, 625049 Russia Tel.: (3452) 30-69-72, (3452) 30-69-72, (3452) 30-69-73; Fax: (3452) 30-69-74; e-mail: <a href="mailto:yugson@mail.ru">yugson@mail.ru</a> <a href="http://www.yugson.ru">www.yugson.ru</a></p>	<p>Yugson Service designs and manufactures packer equipment and other oilfield service equipment. It also provides a wide range of technologies aimed at well completion, stimulation, workover and well intervention.</p>
37	<p><b>TEGAS</b></p> <p>Krasnodar Compressor Plant Repin Ave. 20, Suite 43, 350051 Krasnodar, Krasnodar Krai, Russia Tel.: (861)299-09-09 Fax: (861)279-06-09 e-mail: <a href="mailto:info@kkzav.ru">info@kkzav.ru</a> <a href="http://www.kkzav.ru">www.kkzav.ru</a></p>	<p>Engineering company TEGAS supplies a wide range of compressors both of home manufacture and imported. Krasnodar Compressor Plant manufactures different types of compressors, nitrogen units and other equipment.</p>

38	<p><b>OOO NPP Ros TEK Technologies</b></p> <p>Tel:(988) 240-70-10  (988) 240-70-10  Tel., Fax: (861) 278-22-69,  (861) 278-22-89,  (861)278-22-33  e-mail: mail@npprtt.ru  www.npprtt.ru</p>	<p>The key activities of NPP Ros TEK Technologies are:</p> <ul style="list-style-type: none"> <li>- manufacture of downhole tools used with coiled tubing and wireline for well intervention operations;</li> <li>- manufacture of chemical agents for treatment fluids and cementing materials;</li> <li>- activities aimed at environment protection.</li> </ul>
39	<p><b>OAO Sibneftemash</b></p> <p>15<sup>th</sup> km of Tobolskiy Tract, Tyumen District, Tyumen Region  Tel.: +7 (3452) 762-319,  +7 (3452) 762-319;  Fax: +7 (3452) 762-300;  e-mail: marketing@sibneftemash.ru  www.sibneftemash.ru</p>	<p>Sibneftemash designs and manufactures special oil-field equipment for well stimulation done during intervention works and workover, squeeze jobs and hydraulic fracturing.</p> <p>Products:</p> <ul style="list-style-type: none"> <li>- equipment for well workover;</li> <li>- fracturing equipment;</li> <li>- downhole tools;</li> <li>- fixed and mobile cement storages;</li> <li>- tank equipment;</li> <li>- oilfield equipment and spare parts;</li> <li>- additional services.</li> </ul>
<p>RESEARCH INSTITUTES, ENGINEERING COMPANIES</p>		
40	<p><b>GAZPROM VNIIGAZ</b></p> <p>Razvilka, Leninsky Rayon, Moskovskaya Oblast, 142717, Russia  Tel.: (495) 355-92-06, (495) 355-92-06;  Fax: (495) 399-32-63;  e-mail: vniigaz@vniigaz.gazprom.ru  e-mail: adm@vniigaz.gazprom.ru  www.vniigaz.ru</p>	<p>The key activities are:</p> <ul style="list-style-type: none"> <li>- geological and geophysical surveys;</li> <li>- oil fields development and operation;</li> <li>- offshore oil field infrastructure construction;</li> <li>- underground gas storage;</li> <li>- gas transmission and unified gas supply system safety;</li> <li>- gas refining;</li> <li>- design and exploration work;</li> <li>- gas usage by transport systems;</li> <li>- information and technical support of research work and mathematical modeling.</li> </ul>
41	<p><b>OOO Gazprom geofizika</b></p> <p>8/2 Bolotnikovskaya St., 117149 Moscow, RUSSIA  Tel.: +7 (495) 775-9575,  +7 (495) 775-9575;  Fax: +7 (495) 775-9565;  e-mail: office@gazpromgeofizika.ru  www.gazpromgeofizika.ru</p>	<p>Gazprom geofizika renders services in geophysical and information support of an oil recovery, gas and other minerals at all stages of technological process - from search and investigation of deposits before operation and preservation of wells; various kinds of technological services in the field of drilling and repair of wells. Works are conducted in largest territory of the oil and gas provinces of the country and abroad: in the European</p>

		part of Russia, Western and the Eastern Siberia, in Kazakhstan, Latvia, Turkmenia, Belarus, China and Bulgaria etc.
42	<p><b>OOO Tyumen NII Giprogaz</b></p> <p>Vorovsky Str. 2, 625019 Tyumen.  Reception room of the Acting Director  General Sergey Alexandrovich Krylov  Tel: (3452) 21-15-45  Fax: (3452) 21-15-49  e-mail: info@tngg.info  www.tngg.info</p>	<p>Tyumen NII Giprogaz is an integrated research, development and production center whose main function is to provide engineering support to gas industry in West Siberia..</p> <p>The range of scientific work includes:</p> <ul style="list-style-type: none"> <li>- development and operation of gas condensate and oil fields;</li> <li>- development of gas fields;</li> <li>- geological and geophysical exploration;</li> <li>- hydrogeology survey and ecology of aquatic environment;</li> <li>- well construction;</li> <li>- gas production, refining and transportation;</li> <li>- geotechnical monitoring in cryolithozone;</li> <li>- investment projects and evaluation of scientific work effectiveness.</li> </ul>
43	<p><b>OOO NK Rosneft NTC ,</b></p> <p>Krasnaya Str. 54, 350610 Krasnodar, Russia  Tel.: (861) 262–34–97,  (861) 262–34–97;  Fax: (861) 262–64–01  www.rn-ntc.ru</p>	<p>NK Rosneft NTC specializes in scientific and technical work, research work and creation of design and estimate documentation for construction of oil and gas sites.</p>
44	<p><b>Gubkin Russian State University of Oil and Gas</b></p> <p>Leninsky prospekt. 65, Moscow  Tel.: +7 (095) 930 92 25  +7 (095) 930 92 25  www.gubkin.ru</p>	<p>Gubkin Russian State University of Oil and Gas is Russia’s principal school of petroleum engineering It was founded for about 80 years ago.</p> <p>The key activities are as follows:</p> <ul style="list-style-type: none"> <li>- professional training;</li> <li>- research work;</li> <li>- international cooperation;</li> <li>- publishing;</li> <li>- inventive work.</li> </ul>

NONPROFIT ORGANIZATIONS, MASS MEDIA

45	<p><b>ICoTA</b></p> <p>P.O. Box 1082          Montgomery, TX 77356          Allison Babin - Administrator / Board Secretary          e-mail: ababin@icota.com          Tel/Fax: 832.2019977          Physical Address:          1325 Eva Street, Suite 8          Montgomery, TX 77356</p>	<p>The Intervention &amp; Coiled Tubing Association (ICoTA) is a not-for-profit organization aimed at promotion and development of coiled tubing technologies by means of professional networking, assistance to equipment manufacturers, information campaigns and publishing activities. Membership comprises individuals from all sectors of the coiled tubing industry including service users, service providers, tubing and equipment manufacturers.</p>
46	<p><b>NP CTTDC</b></p> <p>5/1 Pyzhevsky Lane, Suite 425          Moscow 119017 Russia          Tel: +7 499 788 9124          Fax: +7 499 788 9119          e-mail: cttimes@cttimes.org          www.cttimes.org</p>	<p>Non-for-profit Partnership «Coiled Tubing Technologies Development Center” sees its primary objective as development of coiled tubing technologies. It is done by means of professional exchange, assistance to manufactures, information and awareness-raising activities as well as publishing activities.</p> <p>The members of the partnership are united by similar goals, which are information dissemination, analysis of coiled tubing industry development and identifying its prospects.</p>
47	<p><b>Coiled Tubing Times Journal</b></p> <p>5/1 Pyzhevsky Lane, Suite 425          Moscow 119017 Russia          Tel: +7 499 788 9124          Fax: +7 499 788 9119          e-mail: cttimes@cttimes.org          www.cttimes.org</p>	<p>Scientific and practical journal Coiled Tubing Times is one of few periodicals entirely devoted to coiled tubing and well intervention activities. It has been published since 2002 in Russian and in English (parallel text). The audience is represented by specialists of servicing and oil and gas producing companies and structures designing and producing equipment and instrument for well intervention. The journal is delivered to companies' top-managers and government officials by targeted mailing. It is also disseminated at the leading industry events: annual international coiled tubing and well intervention conferences and exhibitions in Aberdeen and Houston, largest oil and gas exhibitions in Moscow, Almaty, Tashkent, etc.</p>

48	<p><b>Oil &amp; Gas Eurasia, Journal Russia</b></p> <p>P.O.Box 119, 125009, Moscow  Tel.: +7 (495) 781-88-37  Fax: +7 (495) 781-88-36  info@eurasipress.com  www.oilandgaseurasia.com</p>	<p>Oil &amp; Gas Eurasia is a bilingual monthly journal highlighting both major projects of oil and gas industry in Russia and CIS and the technologies and equipment used for these projects. The Journal is distributed among industry experts representing all oil and gas producing regions as well as during major industry events, exhibitions and conferences.</p>
49	<p><b>Slant, Catalogue/Oil Equipment, Journal</b></p> <p>SLANT, P.O. Box 61, Moscow 125424, Russia  Tel.: (499) 192-5597, 192-5106  Fax: (499) 192-6439</p>	<p>Publishing House «Slant» produces the annual targeted reference book «Oil &amp; Gas - Exploration – Equipment. Russia and CIS» and the journal «Oil &amp; Gas Equipment. Price Report». The Reference book provides information on more than 3200 industry-related companies. The Journal provides information on commercial delivery terms for oil &amp; gas equipment and rolled metal products manufactured by major suppliers from Russia, Azerbaijan, Belarus, Kazakhstan, Uzbekistan and Ukraine.</p>
50	<p><b>Burenie I Neft (Drilling &amp; Oil), Journal</b></p> <p>Kashirsky Proyezd 21, Suite 42, Moscow 115201, Russia  Tel.: (495) 504-9867, 979-1333  Fax: (499) 613-9317  e-mail: info@burneft.ru, well@dol.ru  www.burneft.ru</p>	<p>The Journal Burenie I Neft highlights the issues of oil &amp; gas production and refining, well construction and intervention, production of petroleum products and natural fuel including lubricants and gasoline. The Journal also introduces drilling and production equipment of both domestic and foreign manufacture.</p> <p>Distribution network:</p> <ul style="list-style-type: none"> <li>- oil &amp; gas companies;</li> <li>- oil &amp; gas production departments;</li> <li>- exhibitions and conferences;</li> <li>- oil &amp; gas equipment manufacturers;</li> <li>- educational and research organizations.</li> </ul>

**ABSTRACTS OF THE CONFERENCE REPORTS****EXPERIENCE OF APPLYING CT TECHNOLOGIES FOR WELL SERVICE AT WESTERN SIBERIAN FIELDS**

*Nikolay Rakhimov, Chief Engineer, Gazprom Podzemremont Urengoi*

Gazprom Podzemremont Urengoi is the biggest well service enterprise in the structure of Gazprom. The application of CT technologies expanded our technical opportunities and enlarged the range of services and operations. From 2001 through 2008 the CT units helped to provide 500 services including: remedial cementing, sand washing, limitation of bearing-out of mechanical impurities, placing cement plugs without well killing, etc. Depending on the reasons for the flooding, the following CT water isolation technologies are used to stop the water influx: pumping cement and polymeric air foamed slurries, drying bottomhole with acetone and methanol, hydrophobization of bottomhole. The terms of such service operations reduced by 2–3 times and inventory expenses were curbed twice. A CT technology for fixing the bottomhole with soda water glass is widely applied in operations aimed at limitation of bearing-out of the formation sand. The problem of well development was solved after the invention of completion technique based on step-down FL recession and involving CT units and nitrogen and natural gas pumping units. The terms of gas and gas condensate well development decreased by 4–5 times. A problem of flow stimulation in gas condensate wells should be mentioned as well. Their launch demanded 250–400 shift hours, a consumption of 80–100 m<sup>3</sup> of stable condensate and 8–15 m<sup>3</sup> of acid. We also tried a technology of stimulating gas-condensate wells by gradual acid spotting and timely release of reaction product to the flare with the help of CT technologies. Beside well development and stimulation, the units are planned to be used for cleaning (air circulation) of the bottomhole from water and checking the structural integrity of the strings. In total the company brought down the average cost of services by 17% and well workover target was outstripped by 5%. The problems that should be mentioned include poor supply of specialized goods, non-standard and custom-made equipment and instruments for CT units. Such equipment is necessary for holding special operations similar in their quality and technical specifications to foreign equipment.

**SIGNIFICANT REDUCTION OF CYCLE OF BRINGING NEW WELLS INTO PRODUCTION USING ABRASIFRAC TECHNOLOGY AT PRIOBSKOE OILFIELD OF LLC ROSNEFT-YUGANSKNEFTEGAS**

*Konstantin Burdin, Business Development Manager, Schlumberger Logelco Inc.*

The Priobskoe oilfield is mainly introduced by three zones of interest AC10, AC11 and AC12, which are highly laminated and in general there are from 3 to 4 zones of each well to be stimulated.

Usually duration of conventional Workover (WO) and Fracturing operations on 3-layered wells may be as long as 3 and more weeks. Current procedure of bringing new well into production includes the following steps: wellbore preparation; lower zone perforation; Installation of tubing and packer; fracturing treatment; unloading of the well; relocating of the tubing and packer depth to reset for the next zone; isolation of stimulated zone with proppant/cleanout excessive proppant till required depth.

AbrasiFRAC<sup>®</sup> technology has been introduced by Schlumberger as an effective method for reducing the fracturing cycle and bringing new wells in production.

This technology represents an integration of two services – Fracturing and Coiled Tubing (CT) – employing a special downhole tool AbrasiJET\* which gives an opportunity of sand jetting perforation by pumping sand slurry down CT string, if needed - zone isolation with proppant, fracturing zone of interest, cleanout and kickoff the well after all zones have been stimulated. In this operation Fracturing and Coiled Tubing services run simultaneously on the same well. This technology creates cavities behind the casing thus help to eliminate near wellbore issues and have aggressive fracturing design without any limitations with pumping rates up to 5 m<sup>3</sup>/min and proppant concentration up to 1200 kg/m<sup>3</sup>, with pumping proppant of large mesh size including 12/18 and 10/14. Need to mention here that the stimulation is being done through 15–18 holes with a size of 13–15 mm in diameter.

Cycle time of bringing a new well into production using AbrasiFRAC technology is on average 7–10 days. To date Schlumberger has completed 20 AbrasiFRAC wells with 60 layers successfully stimulated. To date the largest AbrasiFRAC in the world has been performed in the Priobskoe oilfield with 260 tons of proppant placed. For all the wells completed using AbrasiFRAC technology the total cycle time of bringing new wells into production has been decreased by the total amount of 200 days. As a benefit of the technology there is not only fracturing cycle reduction but reduction of risks associated with well operations due to decrease in number of runs of tubing and packer, WO activities, wireline perforation activities, etc; decrease of formation damage caused by well killing fluid and significantly decreased time of formation exposure to gelling agents.

## IMPROVING WELL INTERVENTION SERVICEABILITY AND RELIABILITY THROUGH ADVANCEMENTS IN COILED TUBING MANUFACTURING TECHNOLOGIES

*Bernie Luft, Sr. Technical Consultant, Global Tubing LLC*

This paper discusses some of the key limitations in high-strength, low-alloy (HSLA) steel coiled tubing (CT) reliability and serviceability with respect to material performance such as low cycle fatigue, ballooning, corrosion, sour well interventions and mechanical damage tolerance. Many years of coiled tubing failure investigations have shown that the majority of causes of failure are due to corrosion and mechanical damage during CT well interventions, with a small percentage of failures resulting from manufacturing defects. Similarly, many years of coiled tubing operations has shown that the majority of CT strings are retired from service often far before achieving their total safe working fatigue life. It is self evident that achieving improvements in CT quality will provide greater reliability however, it would also appear reasonable to suggest that increasing the fatigue life of coiled tubing would be a futile effort.

This paper proposes to show how advanced tube milling technologies applied to the manufacture of coiled tubing products can increase reliability and overcome or at least extend current limitations in coiled tubing serviceability by substantially increasing the fatigue life of newly manufactured coiled tubing strings.

## INTEGRALLY DESIGNED CT TECHNOLOGY OF WELL SERVICE AND PRODUCTION ENHANCEMENT UNDER LOW PRESSURE CONDITIONS

*Sergey Beketov, Chief Research Officer, Oil Company "Rosneft"*

The use of two and three-phase foams is a promising way of reducing the overburden on formation during low pressure downhole operations. The most effective cleaning agent is a foam with anomalous pressure ration of 0.7–0.1. The use of foam systems for washing CT wells has a number of advantages: fast formation pressure trimming by passage from formation overburden to drawdown; better borehole washing; faster wash-out of sand, clay and proppant plugs, destruction of cement bridges by lowering differential pressure in the well-formation system; possibility of several simultaneous downhole operations (bottom-hole cleaning, stimulation of fluids, development, etc.); shorter terms of service; lower service costs.

It should be noted that safe application of foam systems in technological operations has a number of peculiarities: time of downhole pressure change ranges from several to dozens of minutes (depending on the depth of the well), which requires high stability of equipment; underbalanced well wash-out changes rheological properties of foam producing liquid (since it gets mixed with oil). Its foam producing properties deteriorate. As soon as the share of oil reaches a certain level, a stable emulsion may emerge; measures are necessary to prevent pipe sticking; limitation of round trip speed, control over the outgoing flow, examination of tube lifting force.

Flow stimulation is usually carried out simultaneously with bottom-hole cleaning by means of wave motion and exposure to acid compositions (adapted to specific geological factors). The integrally designed technology is successfully implemented in our country and abroad.

## NEW PRODUCTION ENHANCEMENT OPPORTUNITIES

*Sergey Atrushkevich, Leading Designer, CJSC Novinka*

Most of CIS hydrocarbon fields are in a stage of production decline. In such situation the planned level of O&G recovery can be achieved via effective well service and workover as well as effective drilling-in.

Novinka offers the following technologies for successful conducting of the above-mentioned operations: A system of directional drilling for CT units and drilling with rolled pipes. (CHB89); A unit for deep filtration channels (KFK1).

System of directional drilling are meant for guided drilling of wells of all types including underbalanced CT drilling, control of downhole factors and real-time determining of BHA position. Novinka created two types of CHB89 rolled pipes: one with wireline and one with hydraulic connection. BHA can be of 2 size types: Ø76 and Ø89 mm. BHA orientation tools provide for torque of up to 1100 and 1200 Nm for BHA Ø76 and Ø89 mm, respectively. A system of directional drilling with wireline is meant for measuring, transmitting, registration and visualization of the following factors: horizontal and inclination angles, whipstock orientation angle, BHA and well-bottom pressure, weight on bit, rotation, vibration, downhole temperature and the level of gamma rays. KFK1 Unit is meant for drilling deep filtration channels in the reservoir of the production formation aimed at production enhancement. It allows working at the depths of 4,000 m in the strings with the OD of 140 mm and larger. The length of the washed filtration channels is up to 100 m.

KFK1 Unit includes surface equipment: CT reel, pump unit, mud tank, truck-mounted control system, modular platform and underground equipment: guiding assembly, assembly for string milling, and drilling-in assembly. Experts think that guided CT drilling technology and technology of drilling deep filtration channels are the most suitable methods for carbonate formations and formations consisting of highly-porous sandstone.

## LOAD ON DOWNHOLE EQUIPMENT DURING CT WELL WORKOVER

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The principal aspect of well service operations performed with coiled tubing is the reliability of CT and equipment assembled at well mouth. The security issues are especially relevant to gas wells, as all of them are gusher holes with high buffered pressure. There are two types of downhole equipment applied in CT operations. The first of them has a strong connection between the injector and the sealant, another one has no such connection. Though they may seem very simple, the force conditions in the system reel - tube - guiding arc - transporter - footing are hard to analyze, as this is a redundant system with its footing located on visco-elastic platform. The research on inner force factors arising during loading the equipment, assembled at well mouth, such as X-mas tree, show that additional load,

produced by CT stretch, may exceed the acceptable values and bring about loss of tightness in flange couplings and even their destruction. The analysis revealed that the most dangerous situation happens, when the temperature of the surrounding ground gets below 0 °C. In such case the inner force factors in X-mas tree increase. It should be noted that the majority of imported units, operated in the Russian Federation are those with a strong link between downhole equipment and X-mas tree. This type of downhole equipment is especially dangerous and raises the risk of accidents in winter time. The analysis suggests that the safest construction is a unit with Π-shaped mast resting on the ground during the operation and bearing an injector and a guiding arch. The mast is tightly tied with the skid mounted on 4 casing pullers during the operation. The mast is established over the X-mas tree, equipped with preventer and CT packer. Such assembly excludes any additional forces on the X-mas tree and guarantees high level of operational safety.

## COILED TUBING FISHING OPERATION ON LOGGING ASSEMBLY WITH CABLE FOR ZAO "ACHIMGAZ", WELL A18-2.

*Nikolay Kulinich, CT Senior Production Engineer, Schlumberger Logelco Inc.*

1.07.08 15.1m Of logging assembly (logging tool, cable head, 18 logging weights) with the cable were left in the well A18-2 during performing logging job in 3" tubing at the depth of ≈1100m. Length of logging wire left in the well was 730 m. Top of the cable and paraffin plug were determined by an impression block at the depth 376 m 15Oct09. Indications showed that it was possibly a hydrate – paraffin plug that formed during retrieval of the logging assembly during the logging run. The logging tool and wire imbedded in the hydrate-paraffin plug had created a barrier almost completely impermeable to liquid and partially impermeable to gas. All the attempts to create interaction with the reservoir by heating up the plug and well surging were unsuccessful. No interaction with the reservoir (no ability to kill the well) and the paraffin plug left no options to remediate the problem by conventional workover rig or geophysical spooling unit. Use of coiled tubing technology made it possible without killing the well to circulate with hot brine during hydrate – paraffin plug removal and required over pull for cable retrieval. The operation was completed in 17 days including preparation and rig up time. The result of the operation showed, 650 m of logging cable retrieved from the well and a drift run was made to the bottom of the perforated zone. Logging tools were left in the rat hole and the well was returned back to the client for future geophysical surveys and well operation.

## SUCCESS STORY OF REGAINING FULL BORE ACCESS TO FORMATION USING THRU TUBING UNDERREAMING TECHNOLOGY

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The well is located offshore Malaysia in 60 meters of water. It was drilled in 1991 with deviations up to 69°. It is completed as a dual string producer from a upper zone via in the short string and a lower zone via the long string, both 2–7/8" tubing in 9–5/8" 40 lbs/ft casing. In 2008, the lower producing zone was no longer productive with a water cut of 95%. Initially, a water shut-off initiative was planned by performing a coiled tubing cement squeeze. The job resulted in failure due to cement fluid loss into the formation. As a result, the cement unintentionally plugged the casing and tubing and blocked access to the new intended formation. To regain access to the casing and lower zone, it was necessary to perform two procedures with CT; to mill the cement in the tubing and to underream the 9–5/8" casing thru the 2–7/8" tubing. The extended reach required to clean the tubular down to the casing wall posed a major challenge with the possibility of getting the underreamer stuck in the tailpipe, being unable to retract it to re-enter the tubing or damaging the tubing

and/or the completion equipment during retrieval. The milling and underreaming job were successfully carried out despite the challenges, including milling cement in the 9–5/8” casing, high 69° deviation, a tubing leak above the permanent packer, high tool expansion requirement from 2–7/8” tubing to 9–5/8” casing and the use of nitrogen as a motor drive fluid. In this paper the authors will review the history of the well and the problems that lead to the cement job being performed, the reasons for the subsequent problems and the consequences of failure. Subsequently, the paper will review in detail the risks involved in the proposed procedure and the new technology offered. The paper will also discuss the cleanout procedure which was performed successfully and re-established full bore access to the perforations.

## CT TECHNOLOGIES FOR BHT AT INJECTION WELLS

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The Institute of Industrial Chemistry at Gubkin Russian State Oil & Gas University and Tatneft designed an acid treatment technology for injection wells, contaminated with waste water and dry organic acids such as Dry Acid CK-TK4 and multifunctional drilling mud surfactant Neftenol K produced by Khimeko GANG. The waste water and acid composition with drilling mud surfactants are pumped into the bottom hole of injection wells with the help of CT unit, which makes the whole process relatively inexpensive cheap. The application of polymict chemicals allows the CT unit operation at the established pressure rate without any complications. The technology includes several sequential operations with return of the reaction project in separate portions of the solution via CT unit: washing the tubes and bottomhole with 1 % solution of drilling mud surfactant (Neftenol K) in mineralized water; hydrochloric acid bath with Neftenol K.; injecting a portion of Dry Acid CK-TK4 solution into BHZ. Such multi-phased treatment was adopted after studying the contamination of TaBHZ in injection wells and formation-pressure maintenance systems.

The studies helped to find out that the water from Tatneft's FPM system contained a big amount of iron (55 mg/l), while the share of iron in BHZ was very low (0.8 mg/l). It means that iron in the form of contamination structures, containing asphalts, resins, paraffins, slats and clays, accumulates in BHZ. In 2009 Tatneft gave consent for experimental program at its 80 wells that will be carried out by Tatneft Aktubinsk Rem Service.

## TESTING AND USING OF VISCOELASTIC POLIMER FREE SELF DIVERTING SYSTEM VDA® ON WELLS OF THE ASTRAKHAN GAS-CONDENSATE FIELD

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Joint project between Schlumberger and OOO «Gazprom dobycha Astrakhan» which incorporates the use of coiled tubing for operations in the Astrakhan gas-condensate field (AGKM) started in 2007. During the two years of operations there have been huge improvements at incorporating technologies for operating within these extreme well conditions. Search of optimum ways to solve the tasks that the Client presents is a challenge. The Astrakhan Coiled Tubing project won the silver award in Schlumberger's international competition for the Best Project of 2008. This project is also currently nominated for Best Project within the client competition of OAO «Gazprom». In the March 2009 issue of CT Times, there is an article that describes the use of coiled tubing for wellbore cleanouts in Astrakhan. This paper also describes the practice of using coiled tubing and viscoelastic, a self diverting acid system VDA® for selective matrix acidizing of AGKM wells.

Matrix acidizing of gas wells with a net pay of 100 to 200 meters is related to a list of issues and proper treatment of the full interval is a very difficult task. Situation in the Astrakhan

gas-condensate field is complicated by unusual well completions – most of the wells have long tailpipe sections which overlaps the producing interval for 80–90%. This restricts access to the upper and middle part of the producing zone and forces us to perform acidizing from the bottom of the well. Therefore, treatment fluid is required to be lifted up into the annulus traveling the full distance of the producing interval. In the majority of cases this operation is impossible to perform without using a diverting agent, especially in carbonates where high permeability layers and fissured zones often occur. Use of coiled tubing for stimulation is reasonable because of the advantages over conventional workover. Coiled tubing allows performing of wellbore cleanouts before stimulation, which eliminates additional contamination of critical matrix. Also, it is possible to use downhole instrument such as the JetBlaster® with its high jetting effects which allows removal of filtercake and cement.

Presence of H<sub>2</sub>S (up to 25% molar fraction), bottomhole temperature of 110 °C and formation pressure in excess 600 bar give additional limitations for operating especially on the treatment fluids. Fluids which require high pH index for increasing viscosity cannot be used for treatments because of its instability in a sour environment. Example of such fluids is polymer gels with activators/buffers. Also residual contamination of critical matrix is another disadvantage of polymer systems.

Considering all the above, Schlumberger introduced a complex package of self diverting acid VDA® (Viscoelastic Diverting Acid) for selective matrix acidizing and a downhole tool JetBlaster with 360° jetting effect.

Up to present time 16 selective acid treatments using a combination VDA® and JetBlaster package have been performed at AGKM. Dependent on age and condition of the well the increase of productivity rate was 30% to 300% as a result of a multistage job program with base fluid HCl 15%.

## DIRECTIONAL COILED TUBING DRILLING EXPERIENCE WITH THE NEW COLT BOTTOM HOLE ASSEMBLY

*Antoni Miszewski, Managing Director, AriTech Ltd*

These days, many reservoirs are partially depleted and have low bottom hole pressures. Drilling them in an underbalanced condition is sometimes the only way to avoid damaging the formation. Underbalanced drilling often requires aerated drilling fluids which, unfortunately, cause severe vibration and signal transmission problems. Coiled Tubing Drilling (CTD) with electric line is well adapted to this application. In practice, the full potential of CTD has not been realized in many places despite continual activity since the early 1990s. Currently only Russia, Alaska and Saudi Arabia support sustained CTD campaigns. Ultimately it is economic factors which determine the uptake of this technology. This paper presents the field test experience with a new directional drilling bottom hole assembly for CTD which incorporates design features that help to reduce operational time and costs. With these improvements it aims to help CTD to become a more attractive economic proposition so that it can realize its full potential.

## COILED TUBING APPLICATION IN EXPLORATION DRILLING OF SALYM OILFIELD

*Alexander Patalakba, Lead Coiled Tubing Engineer, Salym Petroleum Development H.B.*

In Q1 2009 Salym Petroleum Development B.V. (SPD) jointly with Schlumberger Logelco Inc. executed an assessment of the presence of oil and gas content in Bazhenov formation deposits (JS-0 formation). That is unique geological horizon with unconventional indications of hydrocarbons and reservoirs. Hydrocarbon reservoirs of Bazhenov formation in most cases are represented by shales, enriched with organic content, siliceous deposits and cavernous fractured carbonate rock. One of the most important tasks of Bazhenov exploration is to locate the prospective oil zones using different techniques and strategy. As part of this

effort 3 wells were to be drilled in prospective oil zones, one being characterized by high temperature  $>135^{\circ}\text{C}$  and an anticipated formation pressure up to 490 atm. Possessing the necessary expertise, qualified personnel and equipment, Schlumberger Well Services were involved for the project execution and coordination. Initially the well was drilled and cased conventionally by the rig placing TD into the Upper Bazhenov Member (JS-0). With tubing installed and packer set, the well was handed over to Schlumberger Coiled Tubing for non directional well deepening into underlying Middle and Lower Bazhenov. Drilling of this section was performed in underbalanced condition in order to in order to appraise the long term unimpaired productivity of the formation. The survey section of the well was tested and then logged by means of wireline. At the final stage, the section was abandoned by setting the cement plug through the coiled tubing in accordance with approved procedures and standards.

The survey section of the well with undefined formation pressure was drilled in underbalanced condition with Coiled Tubing with no danger to personnel or the environment. Reservoir characteristics with skin effect were collected while drilling and during the well test stage. A complete suite of logs were acquired in openhole by wireline. Experience in coiled tubing operations and the ability to adapt to this new technology for well testing and exploration drilling, allowed this joint operation to be successfully executed. The following performance indicators were achieved: survey section was successfully drilled with 44 mm coiled tubing grade HS-90, 54 mm downhole motor and 70 mm PDC bit. There were 76 meters of openhole section with clean and stable formation walls penetrating all JS-0 formation. Maximum rate of penetration was 7.2 m/hour. Drilling was done from the top of the formation with azimuth and deviation set by conventional drilling rig. No devices were used for directional control. Dogleg severity was not higher than 2.75 degrees/30 m. Upon the end of well test and logging, the survey section was abandoned by placing the cement plug through the coiled tubing.

## THE EXPERIENCE OF APPLYING CT TECHNOLOGIES AT THE FIELDS OF TATARSTAN

*Rubin Akhmetsbin, Engineer-in-chief of Tatneft Aktubinsk Rem Service*

Tatneft Aktubinsk Rem Service has been applying CT technologies since 1998. Over 5550 of various functions have been serviced since that time including 350 well workover operations with 32 brand new technological operations. 7 coiled tubing units are being operated. The CT units help to perform some 700 treatment operations a year. The jobs are done in the Republic of Tatarstan, Samara and Orenburg provinces. At the moment we do such operations as control of oil fields development, flow stimulation, several special works and a number of traditional well workover services. Starting from 2003, we have applied an annular well service method. Over 800 wells have been serviced since that time including 667 treatment operations. We differentiate technologies in each of these fields and expand the assortment. In the annular space we treat bottomhole with chloride and mud acids, pump recovery enhancement reagents, treat bottomhole with Sheshma reagent, do selective water isolation with AKOP-BH reagent, wash out of the deposits of asphalts, resins and paraffins from the well. The company is improving its technology of selective access to the bores of downhole splitters. The operations are conducted jointly with TatNIPIneft, which developed 2 original constructions of Ha hydraulic diverters. Barge operation on repeated abandoning of the well located in the aquatorium of the river in sub littoral zone can be called unique as well. We managed to do a full-fledged service of the well including elimination of 2 cement bridges and cement foundation pier at the well mouth. At the moment the so-called «flow» method of service engaging several specialized contractors is used in several oil and gas production departments. Using such approach lets the customer cut well service expenses as it excludes technological stops prompted by wait on cement, recovery of temperature and research results.

## AN ACCELERATED COILED TUBING FATIGUE TESTING MACHINE

*Steven Tipton, Professor, Tulsa University*

The fatigue strength of coiled tubing (CT) is evaluated based on limited fatigue data sets collected from a relatively small sampling of material heats for a particular material grade. Generating an adequate quantity of fatigue data is expensive and time consuming with existing CT fatigue testing machines. A new fatigue testing system was created to facilitate the generation of a statistically significant quantity of data 4 times faster than existing methods. The new overcomes the factors that hinder the ability of existing fatigue machines to generate data in a timely and efficient manner. The new system is open in the front for easy sample loading. Samples are inclined for ergonomics and also to assist in the purging of air from the sample prior to testing. The straight form is translated along rigid slides by a hydraulically driven threaded drive, in the manner of a vice jaw. Specimens are quickly clamped between the straight and curved form with the simple push of a button. The clamping pressure is preset by the controller to hold samples in a consistent, repeatable manner. Samples of any diameter can be tested one after the other with no change in fixturing required. A high-volume, low-pressure pump purges samples in a few seconds and clear return tubing allows the operator to assure that no air is trapped in the sample prior to the application of the internal testing pressure. Bending mandrels have compound curvature to avoid hinging, with a short transition section from the straight clamping length to the curvature radius of the gauge section. The system is capable of cycling samples at rates up to 10 cycles per minute over a 48-inch bending radius, and 20 cycles per minute for a 72-inch radius. Larger diameter samples (up to 3.5-inch) can be run more slowly to avoid undue heat generation. The new system displays the instantaneous pressure and the average pressure over the duration of testing. Samples of varying diameter can be prepared and waiting for immediate changeover, reducing the time between tests to about a minute. The number of data points generated per man hour of operating time is easily 3–5 times greater than existing CT fatigue testing machines.

## MODERNIZATION OF CT PRODUCTION AT URALTRUBMASH

*Evgeny Simanov, Lead Engineer, Uraltrubmash*

Uraltrubmash has adopted a policy of improving the quality of CT. The modernization of the production includes launch of new equipment, new steel grades designed for the CT. Technical specifications for new tubes are underway as well. The scope of tube application is expanded. While carrying out the modernization, we give preference to suppliers offering the most advanced and reliable equipment. The results of tubes surveys showed better microstructure of weld connection and high stability of weld properties. IHWT THERMATOOL equipment for local heat treatment of the weld was installed to harmonize tube properties both in vertical and cross sections. Efforts are made to improve the existing steel grades and introduce new ones. For instance, A606 class 4 grade was launched. The experimental tube was successfully tested at Kogalym Well Service Department (Kogalym). New steel grades are tested by OMK-Steel. Technical conditions of supplying longitudinal electric-weld CT in bundles were designed in cooperation with VNIIGAZ and Gazprom. A number of Russian companies participate in our joint projects on the alternative CT use. For instance, we hold joint activities with SiTerra to apply CT in steam generators manufacturing. The technologies simplify the production and makes steam generators more reliable.

## INSTRUMENT FOR CT OPERATIONS

*Evgeny Sbtakhov, Deputy Manager General, RosTEKTechnologii*

Being a designer and supplier at the same time, Ros TEK Technologies produces a number of reliable and comparatively inexpensive downhole instruments for various service

operations. The size of the instruments provides for service operations in 60–114 mm OD strings: elimination of hydrate and paraffin plugs, fishing, well development, BHT, water isolation jobs. The company is working in close cooperation with Integra Services, which has mastered a wide number of operations: washing out proppant from the wells, fishing, milling, working out the tubing of various diameter with downhole drilling motors, restoration of circulation via perforation of the production tubing. At the moment these operations are performed by 4 crews. One more CT unit was bought. Practically all units are supplied with the instruments produced by Ros TEK Technologies. The experience of close and continuous cooperation of service companies and manufactures of equipment and materials brings about new decisions, their fast development and implementation.

## FULL COMPLEX OF EQUIPMENT FOR HIGH-TECHNOLOGY STIMULATION OPERATIONS

*Sergey Yurutkin, Head of Sales and Promotion Division, NOV Fidmash,  
Sergey Kablash, Deputy Lead Design Engineer, CT Units Department Officer, NOV Fidmash*

Nowadays life dictates its own rules and the main charge of hydrocarbons production is imposed upon actual well stock which causes increase in demand for up-to-day high-technology well workover. And at this same moment major importance belongs to effective cooperation between service companies and equipment manufacturers. Fidmash, not being an exception, improves standard units and designs and manufactures the latest samples of equipment taking into consideration customers' wishes and also performs modernization of units manufactured before. Presented materials introduce new equipment developed by NOV Fidmash experts for high-technology stimulation operations: MK30T-40 Coiled Tubing Unit for both onshore and offshore applications (skid design mounted on truck chassis); MK30T-50 Heavy Class Trailer Mounted Coiled Tubing Unit; new generation Injector FM127; Coiled Tubing Unit for operations in tube space; A100 Nitrogen Pumping Unit; H504 Coiled Tubing Support Pumping Unit; H1000C Multifunctional (Cementing) Pumping Unit, SKR43M Coiled Tubing Data Acquisition System of new generation and also auxiliary equipment for well stimulation operations. Furthermore, there will be presented a detailed overview of serial equipment, in particular the whole range of Coiled Tubing Units of all types and Fracturing Fleet. In addition a program of modernization and capital repair of Coiled Tubing Units manufactured from 2000 to 2005 will be described.

## COST-EFFECTIVE CAPILLARY TUBE INSTALLATION IN COILED TUBING

*Ken Newman, Technical Director, NOV CTES*

For over two decades, service companies as well as operators have utilized installations of wireline and capillaries inside coiled tubing for a variety of applications. The economics of installing wirelines as well as other factors limited the use of such installations until the cable installation system was developed in the mid-1990s. This system allowed for wireline to be injected into coiled tubing while it was on a spool. This significantly reduced the cost of wireline installations thus making its use widespread. Capillaries have been used for chemical injection and hydraulic control lines for many years inside coiled tubing. More recently, capillaries have been used to carry and protect fiber optic cables. Like wireline in the past, the benefits of fiber optics have been limited by the economics of the installation method. The surge in downhole fiber optic applications has increased the need for a cost-effective method of installing capillaries inside coiled tubing. The installation of capillaries by way of the cable installation system was dismissed for many years due to its apparent technical infeasibility. This paper discusses the method which was undertaken to utilize the current cable injection system in order to install a single capillary tube inside a coiled tubing string.

## APPLICATION OF NITROGEN PUMP UNITS IN CT TECHNOLOGIES

*Denis Vladykin, Deputy Director General of Marketing, Industrial Group "Tegas"*

The industrial group "Tegas" is one of the leaders of innovative development and commercial production of nitrogen pump units in Russia, industrial security of sites and working out industry requirements and technical standards. The paper demonstrates a scheme of nitrogen units' location on the sites of underbalanced well completion. It considers variants of nitrogen supply to O&G sites. The paper gives examples of CT drilling operations performed with the help of nitrogen units. It considers technical opportunities of various nitrogen compression units as well as modernization of different air compression units so that they could work with nitrogen. Case studies of applying nitrogen compression units are included.

## UNDERBALANCED COILED TUBING PERFORATING AND WELL TEST IN A SINGLE TRIP

*Alexander Slobozhaninov, CT Lead Engineer, Schlumberger Logelco Inc.*

Sakhalin Energy Investment Company Ltd. Lunskeye A platform offshore Sakhalin Island contained deviated wells that required minimal formation damage when perforating. A well test was desired to evaluate the new zone immediately following perforations. Schlumberger Segments of Well Services, TCP and Well Testing led by IPM designed a Coiled Tubing Conveyed Perforation program that would complete the operation in a single run. Sea water from the wellbore was reversed through the Coiled Tubing and replaced by base oil fluids to avoid formation damage and create the desired under-balance before perforating. The perforating run deployed 554 m of 4.5" HSD guns using CIRP (Completion Equipment Insertion, Retrieval under Pressure) and an industry leading X-11 CT unit fully winterized, dressed with a 2-3/8" tapered coiled tubing string. The guns were conveyed to over 2,200 m MD depth and initiated using a double hydraulic firing head. The conveyance operation was designed and monitored using CoilCADE™ and CoilCAT™, Schlumberger proprietary CT software, to accurately predict tubing forces.

The friction coefficients and forces were modeled and continuously updated during the operation to account for the changing wellbore conditions. The guns were immediately moved into the larger vertical completion upon firing. The coiled tubing was stopped while Schlumberger Well Testing completed a 24 hour well test on the zone to generate the initial production data for this reservoir. Following the well test and without killing the well, the guns were retrieved at underbalanced conditions of 2,500 psi WHP in 40 ft sections, using CIRP equipment and the X-11 Coiled Tubing Unit. The operation generated many lessons; the improvements were captured and changes were implemented to provide the operator with best in class service. The CT equipment was immediately rigged up in a second well, the perforating and testing job repeated allowing the operator to initiate production out of the platform at the desired rates within the planned time frame. The use of Coiled Tubing X-11, TCP and CIRP will continue in Lunskeye A platform. Up to this date (August/2009) five big bore gas wells have been perforated using this technique.

## METHODS OF COILED TUBING CONTROL AT CT UNITS IN OPERATIONAL CONDITIONS

*Victor Pevnev, Scientific Associate, Gubkin Russian State University of Oil and Gas*

The major reason for CT failure is appearance of cracks on the external side of the tubes, which quickly turn into holes. Cracks and holes bring about loss of tube's tightness and may spark off emergency situations. During well workover operations the tube runs down

the well and back to the mouth. It is subjected to the internal pressure, torque reaction, bending reaction and longitudinal force. It produces tension, exceeding the limit of liquidity in the process of tube deformation and during its contact with the spool and guiding arch. The pulsation of the cycle «load – unload» changes plastic and strength properties of the material making it more fragile. The method of tubing control is based on the principle of measuring the hardness of the external side of the tube, calculating the strength and deformation characteristics of the material, comparing them with standard values and defining the number of roundtrips and other operations that the given tubing can stand. The measurements are made on a new tube and are repeated in 10...20 downhole operations. The obtained hardness data will be transmitted into the values of material strength limit. A value of deformation is found in data base for this limit. This value corresponds to the moment of destruction for the given number of loading cycles. The compulsory condition for receiving the reliable results is the presence of data base on strength and deformation properties of the materials received in laboratory conditions.

## THERMALLY INSULATED CLEANING UNIT ON SEMITRAILER FOR COILED TUBING DEVELOPMENT (POTOK UNIT)

*Sergey Shmonin, Head of Marketing Division, OAO Sibneftemash*

At present, this is one of the most successful technologies at the domestic oilfield service market. It is widely used for different purposes – from drilling to well workover.

One of the most common services employing coiled tubing is washing of the bottomhole after fracturing. When a conventional technology is applied, it takes 1,5 days to complete the task, while using the unit POTOK (manufactured by Sibneftemash) reduces the time to 18 hours.

The unit complies with the safety regulations for oil and gas industry PB 08-624-03 and traffic rules.

The unit's configuration:

- storage capacity;
- choke manifold;
- pumping unit;
- base – semitrailer;
- drive track.

The washing liquid flows through the choke manifold along the filling line into the storage capacity, consisting of three sections. The first section is where separation of gas from liquid happens; gas withdrawal is done through outlet pipe to the atmosphere. The second and third sections are where cascade cleaning of fluids from mechanical impurities happen. The purified liquid with total suspended particulate of up to 100 mg / l is used for further cleanout. To clean the tank from mechanical impurities feed screw built in storage capacity is used.

Additionally some auxiliary equipment can be provided:

1. Manifold line;
2. High-pressure hose;
3. Articulated knees;
4. Line for the steaming-out of storage capacity.

