



# INTI

INSTITUTE FOR INITIATIVES  
IN OIL AND GAS TECHNOLOGIES



## INTI's DIGEST 4th quarter 2021

English Version



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## **INTI EXPERT DELIVERED A SPEECH ON GREEN TRANSITION AT THE INTERNATIONAL CONSTRUCTION FORUM**

From 5 to 7 October, the International Construction Forum took place in Yekaterinburg. More than 500 leading international experts in the field of urban planning, transport and ecology participated in the event.

Within the Section on Adaptation to Climate Change, Sergey Gureev, INTI expert and the Head of Capital Construction Department of Gazprom Neft, took the floor. In his report, Mr. Gureev spoke about the importance of the Green Deal and the prospects of cooperation with INTI in this field.

According to one theory, CO2 emissions are one of the main reasons of global warming. That is why, all civilized nations seek to minimize harmful atmospheric emissions. The speaker noted that climate risk and investment risk are the same thing as the biggest investors tend to get rid of stocks of those companies which do not contribute to green transition.

For instance, the Norwegian Government Pension Fund announced that the equities of those companies which solely explore and exploit fossil fuel will be sold. The European Investment Bank, for its

part, will cease lending to companies which work with any hydrocarbon material.

The speaker, also, mentioned such companies as Total, the French oil and gas company that withdrew from the American Petroleum Institute (API) over disagreement on approach to climate change solutions, and BlackRock, the world's largest investment company that announced its decision to get rid of stocks of those companies which do not support green transition.

It is worth mentioning that nowadays green companies tend to demonstrate the higher

commercial value than traditional ones. Thus, for example, in November 2020, ExxonMobil, the American oil and gas company with the market value of \$138 billion, was worth less than NextEra Energy, the energy company with the market value of more than \$148 billion. The reason is because NextEra Energy is the world's largest generator of renewable energy from the wind and sun.

Today, the first steps towards green building are made in Russia. They will reduce harmful emissions and construction waste on the planet, preserve people's health and reduce costs of resources for the facilities construction and operation.

INTI Green Committee has developed the first-ever Industrial Green Building Standard for oil and gas industry in order to make construction sites more environmentally friendly. The standard allows planners and customers to choose the best solutions for facilities construction, implement innovative technologies and calculate energy consumption intellectually.

## GREEN BUILDING

*is a type of construction and operation of buildings with minimal impact on environment which is aimed at reduction of consumption level of energy and material resources throughout the entire life cycle of a building.*



**SERGEY GUREEV**

The Head of Capital Construction  
Department of Gazprom Neft



**The Industrial Green Building Standard for oil and gas industry will make construction sites more environmentally friendly in the future. Among other things, it will increase their investment attractiveness.**

## **INTI EXPERTS CONDUCTED A ROUND TABLE ON THE DEVELOPMENT OF INDUSTRIAL AUTOMATION AND METROLOGY**

Nowadays, the biggest oil and gas companies have managed to establish a solid infrastructure for carrying out experimental-industrial trials of equipment with the subsequent quality and reliability assessment at all stages of the life cycle.

This allows to implement new domestic solutions into production activities without significant risks. However, at the same time there are a number of challenges on the path towards technological independence. That is why, on October 20, INTI experts and the representatives of the biggest Russian oil and gas companies held a round table in St. Petersburg. During this event, the solutions to the challenges in the field of industrial automation and metrology were discussed.



### **1 CREATION OF A DOMESTIC CONFORMITY ASSESSMENT SYSTEM**

In order to get access to local projects, a Russian manufacturer needs to undergo functional safety certification. This can be done only within foreign conformity assessment systems as there is no mechanism for it in Russia. In the conditions of sanctions, it is linked to big risks. That is why, the experts consider it necessary to explore the prospects of creation of an equivalent domestic conformity assessment system.

### **2 CREATION OF A UNIFIED NETWORK OF TEST SITES/CENTERS**

In order to carry out experimental-industrial trials, a suitable test bench is needed. It often takes months to find one. This significantly reduces the speed of replication of innovative products. A possible solution to this problem would be the formation of a unified industry network of test sites/centers.

### **3 CREATION OF A DOMESTIC REAL-TIME PLATFORM**

The digital transformation of business processes is taking place all over the world. Foreign vendors are already creating platforms and solutions based on SaaS and PaaS models, while domestic developers are either just getting there, or trying to create solutions based on models that were outdated several years ago. In these circumstances, to ensure technological independence, it is necessary to ensure interchangeability of equipment based on the domestic Real-Time platform. Otherwise, the work previously done in the field of import substitution is be done in vain.

## DEFINITIONS

**SaaS** is a service which allows users to connect to cloud applications and work in them online (for example, Microsoft Office 365).

**PaaS** is a cloud environment in which you can create your own applications.

**Real-Time platform** is an operating system designed to maintain real-time applications that process data as it is received without buffering delay.



# 4

## CREATION OF INFRASTRUCTURE FOR STAFF TRAINING IN THE FIELD OF INDUSTRIAL AUTOMATION AND METROLOGY

In order to update knowledge and reduce staff turnover, it is necessary to regularly improve the qualifications of personnel in the field of industrial automation and meteorology. The solution to this problem will be the creation of our own infrastructure for personnel training.

**If oil and gas companies join their forces to solve these challenges, they will be able to provide domestic manufacturers with technological independence.**

As a part of the task of developing the domestic personnel training infrastructure, INTI, together with the Oil and Gas Cluster Association, has already initiated the development of a standard for training and certification of specialists in the field "Well Control. Well control at gas, oil and water inflow and open flow". Experts which

have experience in organizing and training specialists in IWCF and IADC areas as well as practical experience as chief specialists in gas, oil and water inflow, supervisors and other positions directly related to management, control, organization and implementation of works at well construction facilities take part in development of the standard.

The standard is planned to be used by training centers and companies engaged in exploratory and production drilling of mining holes on oil and gas, down hole treatment and development of oil and gas wells in the Russian Federation.

## INTI EXPERTS TOOK PART AT ADIPEC INTERNATIONAL EXHIBITION AND CONFERENCE

From November 15 to 18, Abu Dhabi hosted ADIPEC International Exhibition and Conference with the participation of INTI experts. The exhibition provides a world-class environment for buyers and sellers to meet, learn, communicate, do business, and discover new products, solutions, and technologies from more than 2,000 exhibiting companies which demonstrated their innovative approaches on investment and collaboration with the energy sector.



**ADIPEC** is the largest international event in the oil and gas industry, where relevant ministers, representatives of major oil and gas companies and suppliers of equipment for the industry present advanced technologies and solutions.

During the event, INTI experts demonstrated a stand with the Institute's main products, took part in the work of the Intergovernmental Russian-Emirati Commission on Trade, Economic and Technical Cooperation, and held a round table with oil and gas industry experts.



Due to LUKOIL company which is a platinum sponsor of the Middle East Energy Club, the round table was held. Mikhail Kuznetsov, the Head of Technological Partnerships and Import Substitution Department of Gazprom Neft, and Vitaly Konyshov, the Head of Procurement Department, Logistics, Refining and Marketing of Gazprom Neft, spoke at this event on behalf of INTI. The key topics of the discussion were prototypes of INTI digital services and expansion of cooperation with OPEC+ countries.

At the round table, the ideas of INTI were supported by Alexander Kashlev, CEO of ML One Solutions, and Marina Churaeva, Business Development Director of Oil & Gas Systems group. Furthermore, the Oil & Gas Systems group was invited to participate in the development of the industry standard for automatic pad metering stations as an expert in oil and gas metrology in November 2021.

Denis Deryushkin, the Head of Directorate of Expert Analytical Center, also, delivered a report on reduction of carbon footprint and development of hydrogen energy at the round table. Nikolay Galin, the Chief Engineer of Yugraneftprom oil and gas company, gave a presentation on why joint development, recognition of technical requirements and standards will change the market (based on the example of rotary-steerable systems testing).

### PROTOTYPES OF INTI DIGITAL SERVICES

**INTI.docs.** A tool which brings together experts to exchange experience, develop and approve standards and which provides with a large data base of domestic and foreign standards, analytical materials.

**INTI.quality.** A service for manufacturers, through which a manufacture can undergo the conformity assessment of its products.

**INTI.insights.** An analytical service in the form of a catalog which helps manufacturers and consumers to find each other. This catalog provides information about industrial products which were assessed by INTI, including description and customer comments.

### MIDDLE EAST ENERGY CLUB

*is where members can meet and exchange knowledge and ideas with fellow industry leaders, government officials and policymakers, in a relaxed atmosphere, outside the formal structure of ADIPEC's busy program.*

### EXPANSION OF COOPERATION

#### The Memorandums on Cooperation were signed with:

- ✓ SOCAR (Azerbaijan)
- ✓ KazMunayGas (Kazakhstan)
- ✓ ADNOC (UAE)
- ✓ Uzbekneftegaz (Uzbekistan)
- ✓ Kuwait Petroleum Corporation (Kuwait)
- ✓ Sonatrach (Algeria)

#### The negotiations on cooperation are also held with:

- ✓ Saudi Aramco (Saudi Arabia)
- ✓ Petronas (Malaysia)
- ✓ Sonangol (Angola)
- ✓ Bahrain Petroleum Company (Bahrain)
- ✓ OQ (Oman)
- ✓ Total (France)

The Memorandums allow national oil and gas companies from OPEC+ countries to obtain Observer status which gives a right to use all INTI tools within one year.

In the future, INTI is looking forward to build partnership with other national oil and gas companies from OPEC+ countries.



**NIKOLAI GALIN**

The Chief Engineer of Yugraneftprom, LUKOIL Group of Companies



**Technical requirements and the coordinated program of pilot development planning which were developed within INTI helped to carry out effective testing of local prototype of rotary-steerable system. In the future, INTI will update the developed standards, as appropriate. Due to clear rules, the cost of developing of new domestic equipment will decrease, the period of commercialization will be reduced and the quality will be enhanced.**



The interaction with INTI is progress. We support the work done by the Institute and its plans. We also looking for potential collaboration on standardization, hydrogen production and carbon dioxide utilization. This will help us to achieve the goals set at the state level.

**DENIS DERYUSHKIN**

The Head of Directorate of Expert Analytical Center of “Russian Energy Agency” (REA) by the Ministry of Energy of the Russian Federation



INTI gives technological independence, it allows to find a quality analogue of a product in the region of presence, get competitive pricing, improve the system of interaction management with local suppliers and optimize the cost of experimental-industrial trials and runs.

**VITALY KONYSHEV**

The Head of Procurement Department, Logistics, Refining and Marketing of Gazprom Neft



INTI`s initiative is to create an industrial testing ground is extremely important and well-timed. At the moment, service companies do not have opportunity to test their equipment in conditions close to downhole which entails high risks during pilot development planning. Those risks fall on the shoulders of vendors, not customers. Our company is ready to contribute to the formation of the requirements to the test site and looks forward to its opening.

**ALEXANDER KASHLEV**

CEO of ML One Solutions



Due to the unique INTI platform, we see a real opportunity to implement and promote Russian equipment in the domestic and foreign markets, and also to increase the efficiency and optimization of technological solutions by bringing together a wide range of experts from around the world.

**MARINA CHURAEVA**

Business Development Director of Oil & Gas Systems group



## **INTI EXPERT HIGHLIGHTED THE ISSUE OF INDUSTRIAL WASTE RECYCLING IN RUSSIA AT THE INTERNATIONAL CONFERENCE**

From 2 to 3 December 2021, XII International Conference “Gas and Petrochemical. Towards Green Future” took place in the regional Congress hall in Omsk. The participants were Russian investors, banks, design institutes, professional associations and societies, consulting companies and vendors.

Oksana Kolesnikova, the Head of the Material and Technical Support Department of Gazpromneft-Omsk Refinery, made a presentation on eco-restructuring. At the conference Oksana Kolesnikova represented the Industrial Symbiosis working group of INTI Green Committee.

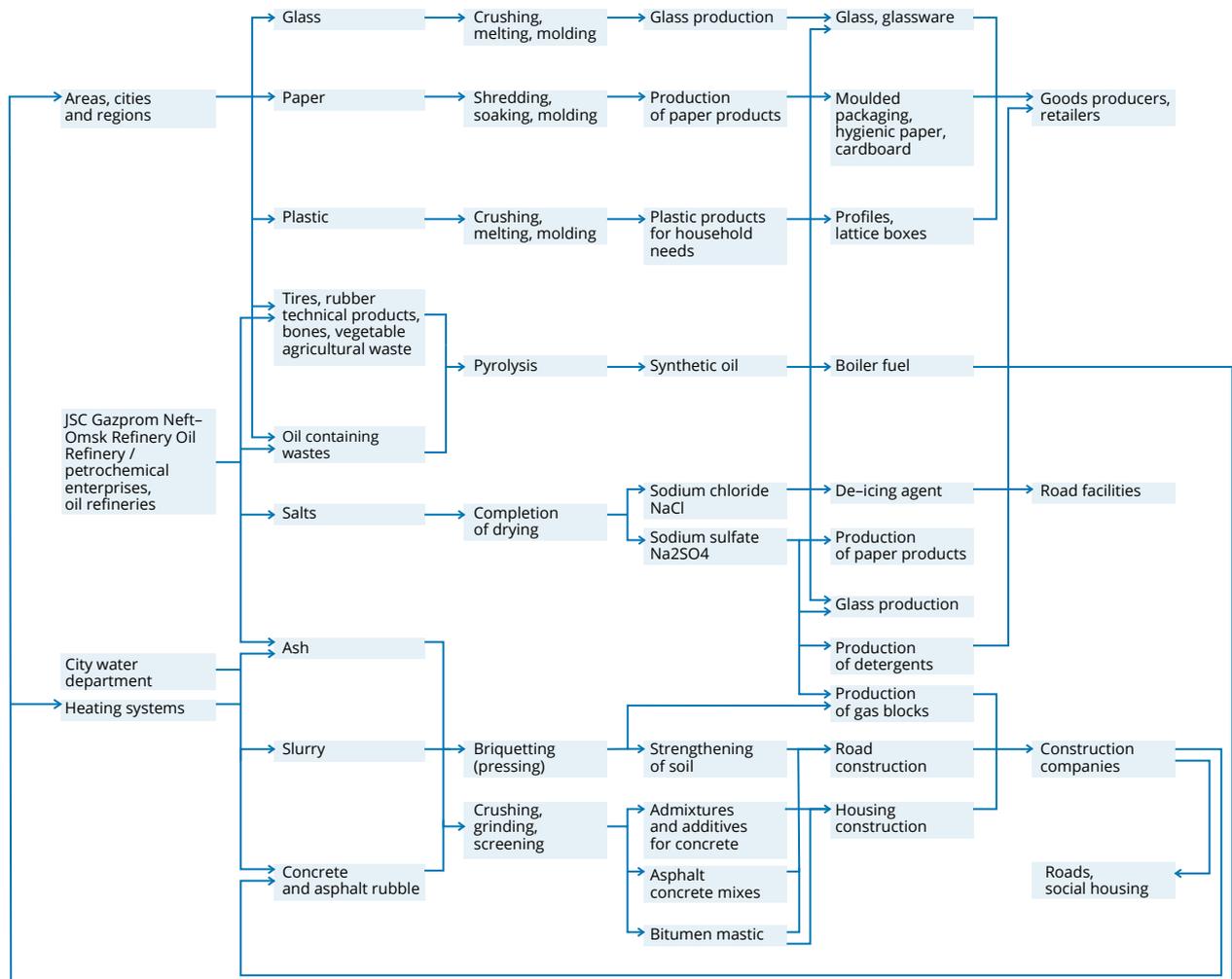
In her report, the speaker raised one of the most important problems in Russia - the problem of waste processing, which is linked, above all, to the shortage of landfills for slurry utilization of water treatment. The shortage of landfills leads to unauthorized dumps and, as a consequence, to environmental pollution. That also entails multi-million dollar fines which are levied on the large industrial enterprises.

Oksana Kolesnikova drew the attention of the participants to the fact that less than 40% of industrial waste and less than 10% of solid waste is recycled in Russia. According to INTI representative, the only way to solve the problem of landfills shortage is to adopt a comprehensive program to create the circular economy within which the waste of one company will serve as raw material for another one.

Using the example of Kalundborg (Denmark), Oksana Kolesnikova spoke about the economic effect of waste recycling. Due to the fact that 11 enterprises exchange more than 20 types of material, water and industrial resources, Kalundborg enterprises save more than 24 million euros a year, and reduce greenhouse gas emissions by 635,000 tonnes of CO2 equivalent.

Today, the Industrial Symbiosis working group is actively conducting research to find new areas of production, products and opportunities for industrial waste recycling. In this regard, the speaker proposed a scheme developed by INTI, which reflects possible directions of circular economy development for Omsk and Kazan.

## PROPOSED AREAS OF CIRCULAR ECONOMY DEVELOPMENT FOR A REGION



At the end of her report, Oksana Kolesnikova invited all conference participants to join INTI`s working group on Industrial Symbiosis in order to combine efforts in organizing industrial waste recycling.



**OKSANA KOLESNIKOVA**

The Head of the Material and Technical Support Department of Gazpromneft-Omsk Refinery



**INTI is a professional platform on the basis of which a model of circular economy has been developed. Such a model is applicable for most regions of Russia. For some companies, such a partnership will bring significant savings in fines and storage at landfills, while for others it will bring waste materials and prime cost decrease of finished product. For a particular region, it will increase environmental friendliness, open innovative industries, create new jobs, improve the social climate, and develop the region as a whole.**

## INTI PARTNERS BUILT A NEW TEST BENCH FOR LEAK TESTING OF DOWNHOLE EQUIPMENT COMPONENTS

At the beginning of December 2021, SibBurMash, the Tyumen company, completed construction of a new stand for validation tests of downhole equipment to

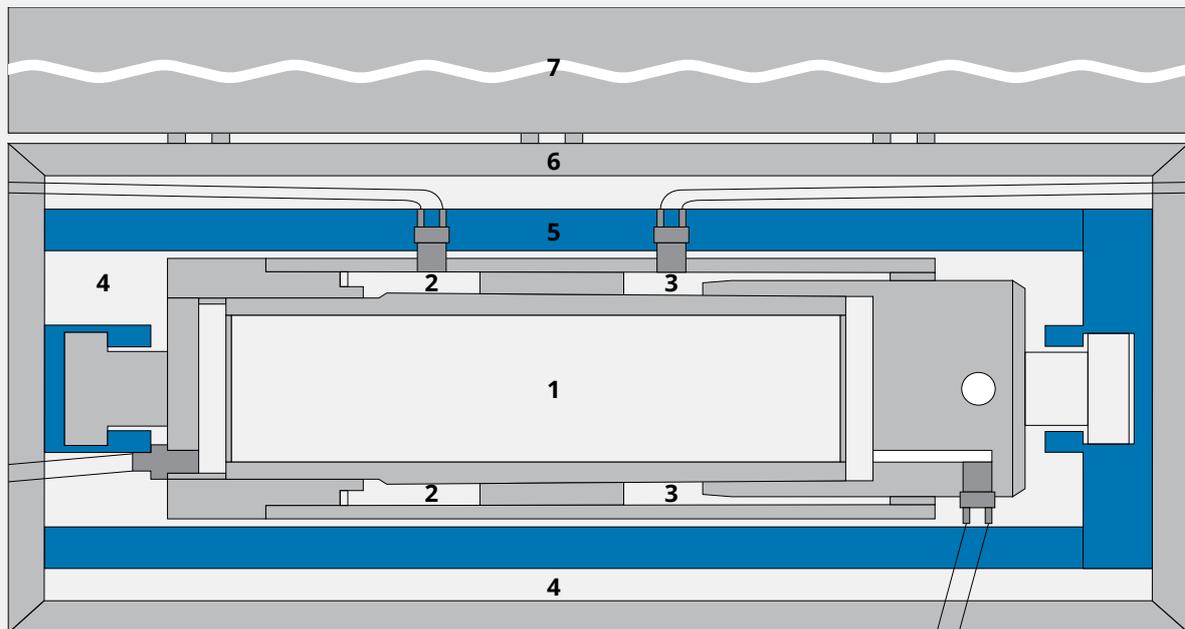
class V0, GOST ISO 14310-2014 «V0». It can be used to test packers, liner hangers, production packers, sealing plugs of various purposes for gasproof. INTI experts visited the stand right after the construction was completed to check its performance and to hold negotiations on including this stand in the testing base of the Institute.

### TEST SCHEME

The equipment is tested in a reinforced concrete pit made in the form of a hopper with a sliding lid. In the bunker there is a sealed bath with a built-in stand for tensioning/compression in the axial direction. The bath is equipped with cameras to control the testing process.

The stands are equipped with software that makes it possible to collect information from the entire set and separately from the stand for hydraulic and pneumatic tests. Also, it is possible with the help of the software to keep an archive of user visits and records of tests of the same product.

The software eliminates the possibility of data stuffing taken from manometers and thermometers.



- |   |                                    |
|---|------------------------------------|
| 1 Interior of a tested product                        | 5 Tensile/compression bench (150t) |
| 2 Upper annular space of a product                    | 6 Bath framework                   |
| 3 Lower annular space of a product                    | 7 Sliding lid                      |
| 4 Heat carrier for the entire volume of an armor bath |                                    |

## TECHNICAL CHARACTERISTICS

**~380V**

Nominal voltage

**50 Hz**

Current frequency

**50 L**

Volume of 1 gas cylinder

**105±1 MPa**

Developed oil pressure (MG-15V or VMGZ)

**200 L**

Volumes of circulating storage tanks in

**no higher than 1.0**

Accuracy class of measuring equipment

**10...40 C°**

Discharge medium temperature

**120 min**

Time of temperature change in the armor bath from 20 to 150 C°

**105±1 MPa**

Developed pressure of air, nitrogen or gas mixture

**No more than 1% in 15 minutes (when tested at maximum pressure), MPa**

Permissible pressure drop of the test bench on the plugs

**Water, oil, air, nitrogen or other gas**

Pressurizing medium

**Gas mixture**

Supported environment

**105±1 MPa**

Developed water pressure

**150 t**

Tensile/compression force

**more than 10 years**

Service life of the stand



The new test center allows to test various downhole equipment for hydraulic and gas leak. New steel cored packers designed in accordance with INTI specifications can be tested for leaks on our test bench in accordance with INTI methodology: under high pressure, under conditions of temperature changes and alternating loads.

**NIKOLAY MARKOVTSOV**

First Deputy General Director of SibBurMash

## **TWO INTI STANDARDS PASSED EXPERT EXAMINATION BY ROSSTANDART AND WERE RECOMMENDED FOR PUBLICATION IN THE FEDERAL INFORMATION FUND OF STANDARDS**

At the end of December 2021, INTI standards S.10.1-2020 on Centrifugal pumps for oil, petrochemical and gas industry and S.20.1-2021 on Wedge Gate Valves passed expertise of technical committees of Rosstandart and were recommended for publication in the Federal Information Fund of Standards.

Now, the references to INTI standards published on Standardinform resource may be indicated in procurement documentation, in particular regarding requirements for manufacturers or suppliers of products, equipment and materials. This is reflected in the position of Rosstandart on the use of standardization documents by state companies in their procurement procedures, in accordance with the provisions of Federal Laws No. 44 on the Contract System in the Procurement of Goods, Works and Services for State and Municipal Needs and No. 223 on the Procurement of Goods, Works and Services by Certain Types of Legal Entities.

The publication of INTI standards in the Federal Information Fund of Standards and examination conducted by Rosstandart technical committees significantly enhance the status of the documents.

The procurement procedures, in turn, accelerate their introduction into the industry.

Other INTI standards are also under examination. The Institute expects to receive positive feedback on them too.

### **THE FEDERAL INFORMATION FUND OF STANDARDS**

*is a state resource that provides with a list of normative documents of the national standardization system.*

## **INTI TOGETHER WITH THE EXPERTS OF THE ASSOCIATION FOR THE DEVELOPMENT OF STEEL CONSTRUCTION HAS DEVELOPED A STANDARD ON MANUFACTURING AND QUALITY CONTROL OF STEEL CONSTRUCTIONS**



The next joint development was the standard on manufacturing and quality control of steel constructions. This document establishes unified rules and industry requirements for the production and quality control of steel constructions, evaluates such aspects of production as park of equipment, factory processes, staff qualification level, control of work stages, and also regulates requirements for the conformity assessment of manufacturing plants.

During 2021 the Association for the Development of Steel Construction (SCDA) worked closely with INTI to develop standards for the oil and gas industry and consolidate on a unified industry platform all interested parties: manufacturers, customers represented by oil and gas chemical companies, licensors and EPC contractors.

Previously, INTI together with experts from leading research institutes in the field of building constructions, materials science and welding, with the support of SCDA, developed Steel Grade Selection and Substitution Guide - Steel Grades Guide.

The further application of the standard within the framework of INTI will improve the quality of steel building constructions manufactured and supplied to oil and gas projects, reduce the cost of searching for a quality manufacturer and reduce the risks of supply disruptions due to poor quality equipment.



**ALEXANDER DANILOV**  
CEO of SCDA



**Compliance of domestic manufacturers with standard requirements will raise the quality of steelwork produced in Russia and significantly reduce the cost of construction on metal, and it will have a positive impact on the image of steel construction in general.**



**SERGEY KORSAKOV**

The Head Mechanical Equipment  
Department of NIPIGAZ, Head  
of the Committee on Materials INTI



The new standard is useful for both suppliers of metalworks and customers as it contains all necessary and sufficient requirements for steel constructions. The standard approval by INTI participants will significantly reduce the costs of customers and manufacturers, reduce the risks of missed deadlines and receipt of non-conforming products.



**IVAN DOLMATOV**

The Deputy Chief Engineer  
for Technical Policy of Gazprom  
Linde Engineering



Gazprom Linde Engineering participates in all activities of INTI Committee on materials. The specialists of the company widely use Steel Grade Selection and Substitution Guide, which allows to apply ready-made solutions for material replacement and, with a right approach, significantly optimize the capital costs of a project.

# INTI TOGETHER WITH EXPERTS DEVELOPED THE STANDARD ON PRODUCTION AND TESTING OF STEEL CORD PACKERS

Steel cord packers have not been represented on the Russian market for a long time. Although, this equipment has been in high demand among Russian oil and gas companies for almost 10 years.

### In Russia, this equipment has not been manufactured for a number of reasons:

- ✓ High complexity of development due to the need to design several large units and connect them into a single mechanism;
- ✓ Lack of specific materials and unique manufacturing technologies;
- ✓ Lack of infrastructure for continuous testing of all elements and confirming the quality of finished product by bench tests.

Another significant barrier was the fact that buyers require certification in accordance with foreign standards in order to confirm the quality of packers. Such certification for new developments is expensive as the necessary certified stands are not available in Russia.

An analysis of foreign standards and experience with imported steel cord packers in Russia revealed that certification to foreign standards is based on an open methodology and does not guarantee sufficient packer quality. This led to the fact that steel cord packers occasionally proved to be leaky in downhole conditions, and their certification was carried out without participation of Russian consumers.

## TECHNICAL CHARACTERISTICS

### Frame size

- 114/127 mm** 5%
- 178 mm** 55%
- 245 mm** 35%
- 324 mm** 5%

### Pressure

- 350 atm** 75%
- 700 atm** 25%

### Validation ISO 14310 2014

- VD** 85%
- V1/V2/V3** 15%

## STEEL CORD PACKER

*is an equipment used as a part of a well construction to separate the annulus and seal the inter-casing space in cased or uncased wellbore in the interval of its installation through metal-to-metal or metal-to-rock contact.*

**To address the challenge of bringing new domestic developments to the market in the framework of INTI the following activities are implemented:**

- ✓ The technical requirements for steel cord packers have been developed and approved. This will allow manufacturers and customers to focus on the necessary functional and technical requirements for packers;
- ✓ The methodology of bench tests for hydro- and pneumatic tightness of steel cord packers has been developed and approved. This will make it possible to test new developments in accordance with the methodology agreed among all parties;
- ✓ A list of Russian test benches that are potentially suitable for packers testing in accordance with the approved methodology has been defined;
- ✓ The market has been analyzed and interaction with three Russian manufacturers of steel cord packers has been built;
- ✓ The standard technical requirements to the test bench for testing equipment for hydraulic and pneumatic tightness in accordance with the class V0 for the subsequent accreditation of test benches are developed.

Therefore, INTI expert community made a big step towards the production of new domestic steel cord packers and possibility of introducing them to the market.



**PHILIP BREDNEV**

The Director of Programs for Technological Development of Drilling and Down Hole Treatment



**The creation of a unified approach in the form of industry standard on lower completion packers is a key example of technically considered actions and a model of a new qualitatively step in the interaction of all Russian oil and gas companies within the framework of INTI platform. The next step in this direction is to create a unified standard for testing gas tightness of underground equipment of upper and lower completions and unified requirements for test equipment to perform them. Due to the import substitution program and such initiatives as the creation of a unified INTI platform, every year the oil and gas industry of the Russian Federation becomes more independent from the challenges of the current monopolization of the technological market segment (technological monopoly) in the provision of oilfield services.**

## INTI DEVELOPS THE DOMESTIC NONMAGNETIC STEEL MARKET

High-strength and corrosion-resistant nonmagnetic steel is used to manufacture borehole telemetry equipment, geophysical instruments, rotary steerable systems and other elements of bottom hole assembly. Such high-quality steel has not been produced in Russia before and has been imported mainly from North America and Europe.

In 2021, INTI experts analyzed the world standards related to non-magnetic steel and the requirements of domestic and foreign companies when ordering products made of this type of metal.

According to the results of the analysis, they found out the following:

- ✓ Foreign standards set minimum requirements for products made of nonmagnetic steel and these requirements are irrelevant to consumer demands;
- ✓ Customer companies either use their own local requirements and rates of quality, or when conducting procurement procedures, are guided by the products of world leaders.

In this regard, INTI developed technical requirements for non-magnetic steel in 2021. This document will make it possible to move from orientation to the characteristics of imported products to the unified requirements and quality scale. It will, also, help to introduce new Russian developments to the market.



In December 2021, Ruspolimet plant performed melting of its own non-magnetic steel grade RUMET-960 on request of PKF Gazneftemash and manufactured bars and drilled pipes in accordance with INTI technical requirements.

In December of that year, the shipment of products and blanks began. The first deliveries have already been made and successfully passed the incoming inspection for the subsequent experimental-industrial trials.

### RUMET-960

*is a non-magnetic steel of the same quality as the products of foreign leaders. At the same time, it is easier machined due to its more homogeneous structure.*

Borehole tests of RUMET-960 steel products will be implemented as a part of a comprehensive INTI program. The tests will also be carried out under borehole conditions. To exclude technological risks, products with increasing technological load will be selected.

**In Q1 2022, the successive downhole tests of the following products will begin at the facilities of INTI participants:**

- ✓ lwd-tele system resistivimeter housing element;
- ✓ non-magnetic sub and tubing;
- ✓ element of rotary steerable system;
- ✓ lwd-tele system housing.

Such a system will make it possible to combine assessments of various product performance characteristics on the INTI platform. All participants of the test program will be able to receive up-to-date information on the results of each stage. This will make it possible to avoid technological risks when using expensive equipment.

The results of the testing program will be analyzed by INTI experts. They will allow all participants of the process to use this steel in the future without additional costs for repeated testing.

### **LWD-TELEMETRY SYSTEM**

*is a system which serves to ensure well targeting along the design trajectory by controlling the curvature, lithology, saturation and operational drilling control.*



## INTI EXPERTS HELP RUSSIA'S FIRST HYDRAULIC FRACTURING TO "SAIL AWAY"

Hydraulic fracturing is the most frequently used method for improving the production efficiency of both conventional and hard-to-recover oil and gas reserves around the world.

Unfortunately, the Russian oil and gas industry has historically been completely dependent on foreign supplies which are necessary for this kind of equipment. Realizing this, Moscow Institute of Thermal Engineering, with the support of the Russian Ministry of Industry and Trade, began the development of a fracture testing complex, and the Titan Barrikady enterprise began the production of the first

domestic hydraulic fracturing.

The complex consists of mobile pumping units for injecting special fluids into wells as well as control and monitoring centers of field laboratories and other special equipment adapted to work with hard-to-recover reserves.

**The planned equipment has a number of advantages over imported analogues, namely:**

- ✓ higher maximum capacity for working with hard-to-recover reserves;
- ✓ increased maximum volume of fluid injection to create a branched fracture network even in extra-dense formations;
- ✓ reduced mass-size characteristics to simplify the process of site preparation for placement.

## HYDRAULIC FRACTURING

*is a method of oil extraction based on injecting a mixture of liquids and a special proppant into an oil reservoir at high pressure at a depth of several kilometers. The operation results in fractures in the rock which allow oil to flow to a well. The longer the fractures, the larger the area of the reservoir they cover, allowing more hydrocarbons to be produced.*

The bench tests are scheduled for 2022, and the testing of the fracturing fleet at the Yuzhno-Priobskoye field in the Khanty-Mansi Autonomous Okrug – Yugra is expected in 2023. In the meantime, INTI experts launched an initiative to develop and approve unified industry requirements for this equipment, which will be used to jointly conduct and recognize the results of the planned tests.



**YURI SOLOMONOV**

The Chief Designer of Moscow Institute of Thermal Engineering, Academician of RAS, Honored Inventor of the RSFSR, laureate of the State Prize of the USSR



Hydraulic fracturing has become the key method of oil and gas production intensification. Moscow Institute of Thermal Engineering is currently solving the issue of national importance to ensure technological safety of the country with regard to the production of fracturing fleets required for these operations. We understand its importance and we support the activities of oil and gas companies to approve unified industry requirements for this equipment and the subsequent joint testing of emerging solutions.

## **INTI HAS DEVELOPED A STANDARD FOR WELDED AND SEAMLESS PIPES MADE OF CARBON AND NON-ALLOYED AND ALLOY STEELS**

Due to difficulties with confirmation of equipment compliance with foreign standards, it was challenging for a local manufacturer to get on the vendor lists of oil and gas processing projects with participation of international licensors and EPC contractors.

In order to solve this problem, SIBUR together with NIPIGAZ developed a standard for welded and seamless pipes made of carbon and non-alloyed and alloyed steels within the framework of INTI Committee on Pipes and Pipeline fittings.

The document is developed in addition to the existing standards for manufacturing of pipe products. The standard harmonizes the requirements of foreign EPC contractors, specifies requirements for types and scope of testing and control, as well as requirements for mechanical properties and heat treatment of pipe products. It gives domestic manufacturers an opportunity to improve the quality of technological pipelines and receive more orders for their products.



**NATALIA BULAVSKAYA**

The Head of INTI Committee on Pipes and Pipeline fittings



**The emergence of INTI S.30.1-2021 standard was an important and necessary step to expand the possibilities of implementing domestic products. The standard makes it possible to understand the necessary requirements of international licensors and EPC contractors in order to supply to oil and gas chemical projects. Also, the document removes the barrier which has to do with the need to comply with foreign standards.**