The enterprises of TVEL Fuel Company are located in 11 regions of the Russian Federation. Information about the Company’s representative offices abroad is available on the website http://tvel.ru/wps/wcm/connect/tvel/tvelsite/about/structure/foreign_offices/

The Fuel Company consists of four complexes for type-specific production of the front end of nuclear fuel cycle (FE NFC):

- **Separation-Sublimation Complex (SSC)** — a group of integrated plants engaged in enrichment and conversion of uranium.
- **Nuclear Fuel Fabrication Complex (NFFC)** — a group of subsidiary industrial enterprises that manufacture nuclear fuel for various reactors.
- **Gas Centrifuge Complex (GCC)** — a group of subsidiary industrial enterprises producing gas centrifuges (GC) and accessories for enterprises of the separation-sublimation complex.
- **Research and Engineering Complex** — the merger of R&D and technological competences of gas centrifuge design bureau (NRDC LLC, OKB-Nizhny Novgorod JSC, Branch of NRDC LLC — Centrotech-SPb JSC) and production facilities (UGCMP LLC) took place in 2015. That was the first stage of Research and Production Association (RPA) establishment in TVEL Fuel Company aimed at R&D improvement and provision of the product full life cycle (from marketing to disposal). The second stage in 2016 will combine ZEP RPA LLC and Uralpribor LLC (Novouralsk CATU).

Specific nature of the social environment of TVEL FC operations is that three enterprises of the Company are located within Closed Administrative Territorial Units (CATU): Seversk, Novouralsk, Zelenogorsk and one is located within a mono-town (Glazov). These enterprises are town-forming organizations and major taxpayers.

1.2. **Position of TVEL FC in the World Market of the Front End Part of the Nuclear Fuel Cycle**

TVEL Fuel Company is a global leader in nuclear fuel production. The Company’s share in the global market of fuel fabrication in 2015 reached 17%. TVEL jointly with Techsnabexport JSC take one third of the world market services on uranium enrichment.
Global nuclear fuel market highlights 2015

- **78** reactors supplied with domestically produced fuel
- **16** countries where nuclear power plants are currently under construction
- **10.3 bln USD** portfolio of export orders for Front End NFC products and services for the next 10 years
- **1.6 bln USD** proceeds from exports of TVEL Fuel Company in 2015
- **441/35** nuclear power units operational globally in Russia, as of 31 December 2015
- **67/7** nuclear power units currently under construction globally in Russia, as of 31 December 2015

Major points of presence

- **35 units** in Russia
- **15 units** in Ukraine
- **6 units** in the Czech Republic
- **4 units** in Slovakia and Hungary

1. Including unit 4 of the Beloyarsk NPP
2. According to IAEA, excluding floating nuclear thermal power plants and the Beloyarsk NPP

TVEL Fuel Company in the Global Market of Nuclear Fuel for Power Reactors

- **United Kingdom**: 1 unit
- **Finland**: 2 units
- **Russia**: 35 units
- **Germany**: 2 units
- **Ukraine**: 15 units
- **India**: 2 units
- **China**: 1 unit
- **Czech Republic**: 6 units
- **Slovakia**: 4 units
- **Bulgaria**: 2 units
- **Armenia**: 1 unit
- **Iran**: 1 unit
- **Bulgaria**: 2 units
- **Armenia**: 1 unit
- **Iran**: 1 unit

Ongoing supplies in cooperation with AREVA

Ongoing supplies of nuclear fuel for units of Russian design
Review of FE NFC World Market from TVEL Fuel Company Perspective

**B**asic factors having influence on the global market of FE NFC products and services are the state and trends in development of the global fleet of nuclear power reactors. Despite the Fukushima meltdown in 2011 that had affected the plans of a number of countries for commissioning of new nuclear power-generating facilities, nuclear industry is still an integral part of the global power sector.

The international market of nuclear power generation is expected to grow primarily owing to China, India, South-East Asia (Vietnam), Middle East (Saudi Arabia, the United Arab Emirates) and Africa (the Republic of South Africa). The European market will remain stable mainly by replacing the outdated decommissioned facilities with the new ones. The U.S. nuclear power market will approach 380 GW by 2022.

URANIUM CONVERSION AND ENRICHMENT MARKETS

The price of SWU commencitated its decline in 2011 and continued in 2015. By the end of the reporting period it dropped to USD 72 per SWU under the long-term contracts. The emerging market conditions and current geopolitical environment give rise to aggravation of competition on the global market of uranium enrichment.

In this connection current and potential customers are offered additional attractive options which will help to both preserve the leading positions of ROSATOM on the global market of uranium enrichment and expand the market share.

**Major events on the market of uranium conversion and enrichment in 2015**

By end of 2015 the Georges Besse II plant gained approximately 97% of the project capacities. Achievement of the target value 7.5 mln SWU/year at AREVA enterprise (France) is scheduled for 2016.

The plant URENCO in New Mexico, USA, reached the capacity of 4.7 mln SWU/year. Construction of the third stage will be carried out according to the schedule. Achievement of the target value 5.7 mln SWU/year is scheduled for the year 2022.

Aimed at self-sufficiency in products and services throughout the whole nuclear fuel cycle chain, China expands its conversion and enrichment capacities, focused on the development of domestic reactor park.

By the end of 2015, the main China’s separation facilities were distributed at four sites (more than 4.5 mln SWU/year). According to estimates in 2020 they will exceed 9 mln SWU/year. Construktion of a new conversion works in Hengyang has started. Their aggregate capacity may reach in 2020 17 mln kgU/year as compared to 5 mln kgU/year in 2015.

In connection with the active expansion of power plants will result in increased competition at the global enrichment market.

Growth of AREVA and URENCO production capacities at enrichment plants will result in increased competition at the global enrichment market.

### Competitive advantages of TVEL Fuel Company: operation excellence, hi-tech, powerful research cluster, continuous fuel improvement.

### Supplies of nuclear fuel for power reactors by TVEL Fuel Company

<table>
<thead>
<tr>
<th>Country</th>
<th>Operations</th>
<th>NPP which is supplied</th>
<th>Project status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>Nuclear fuel supply and related services</td>
<td>Dukovany NPP No. 1, 2, 3, 4, Temelín NPP No. 1, 2</td>
<td>In progress</td>
</tr>
<tr>
<td>Hungary</td>
<td>Nuclear fuel supply and related services</td>
<td>Paks NPP No. 1, 2, 3, 4</td>
<td>In progress</td>
</tr>
<tr>
<td>Hungary</td>
<td>Nuclear fuel supply and related services</td>
<td>Paks NPP No. 5, 6</td>
<td>Prospective</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Nuclear fuel supply and related services</td>
<td>Mochovce NPP No. 1, 2</td>
<td>In progress</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Nuclear fuel supply and related services</td>
<td>Bohunice NPP No. 3, 4</td>
<td>Prospective</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>Nuclear fuel supply and related services</td>
<td>Kozlovice NPP No. 3, 4</td>
<td>Prospective</td>
</tr>
<tr>
<td>Ukraine</td>
<td>Nuclear fuel supply and related services</td>
<td>Rostovskaya NPP No. 1, 2, 3, 4, Khmelnitskaya NPP No. 1, 2, Zaporožchanska NPP No. 1, 2, South-Ukrainian NPP No. 1, 2</td>
<td>In progress</td>
</tr>
<tr>
<td>Finland</td>
<td>Nuclear fuel supply and related services</td>
<td>Lovisa NPP No. 1, 2</td>
<td>In progress</td>
</tr>
<tr>
<td>Finland</td>
<td>Nuclear fuel supply and related services</td>
<td>Hanhikivi NPP No. 1</td>
<td>Prospective</td>
</tr>
<tr>
<td>India</td>
<td>Nuclear fuel supply and related services</td>
<td>Kudankulam NPP No. 1, 2</td>
<td>In progress</td>
</tr>
<tr>
<td>India</td>
<td>Nuclear fuel components supply</td>
<td>RanafThor NPP</td>
<td>In progress</td>
</tr>
<tr>
<td>Iran</td>
<td>Nuclear fuel supply and related services</td>
<td>Bushehr NPP No. 1</td>
<td>Prospective</td>
</tr>
<tr>
<td>Iran</td>
<td>Nuclear fuel supply and related services</td>
<td>Bushehr NPP No. 2, 3</td>
<td>Prospective</td>
</tr>
<tr>
<td>China</td>
<td>Nuclear fuel and its components supply and related services</td>
<td>Tianwan NPP No. 1, 2, 3, 4</td>
<td>In progress</td>
</tr>
<tr>
<td>China</td>
<td>Nuclear fuel supply and related services</td>
<td>Tianwan NPP No. 1, 2, 3, 4</td>
<td>Prospective</td>
</tr>
<tr>
<td>Armenia</td>
<td>Nuclear fuel supply and related services</td>
<td>Metsamor NPP No. 2</td>
<td>In progress</td>
</tr>
<tr>
<td>Belarus</td>
<td>Nuclear fuel supply and related services</td>
<td>Ostrovets NPP</td>
<td>Prospective</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Nuclear fuel supply and related services</td>
<td>Ninh Thu NPP</td>
<td>Prospective</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Nuclear fuel supply</td>
<td>2 Power Units</td>
<td>In progress</td>
</tr>
<tr>
<td>Germany</td>
<td>Nuclear fuel supply</td>
<td>2 Power Units</td>
<td>In progress</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Nuclear fuel components supply</td>
<td>1 Power Unit</td>
<td>In progress</td>
</tr>
</tbody>
</table>
Due to real competition growth in the fuel fabrication market, the initiatives of TVEL Fuel Company on improvement of technical and economic features of the fuel, making its production more attractive for customers both on traditional fuel market for reactors of Russian design, and in fuel market of PWR reactors of Western design, are extremely important.

Major events on the market of NF fabrication in 2015
- Increased competition in the market of nuclear fuel for PWR reactors of Western design;
- the number of operators interested in qualification of Russian fuel TVS-KVADRAT for PWR reactors throughout the world;
- NAC Kazatomprom (Kazakhstan) and CNIM (China) signed an agreement for commercial engineering and construction of TVC manufacturing plant up to 200 tons/year for Chinese NPP in Kazakhstan and on joint development of uranium deposits in Kazakhstan;
- The U.S. Nuclear Regulatory Commission (NRC) performed expert examination and admitted an application of the Korean Consortium headed by Korea Electric Power Co. for consideration and the design certification of the Korean reactor PWR APR-1400 and fuel PLUS/TM 16X16 in the USA.
- Increased competition in the market of nuclear fuel for reactors of Russian design;
- The Ukraine loaded the first batch of modified fuel by Westinghouse in the Power Unit No.3 of the South-Ukrainian NPP.

This company from the USA also undertakes attempts of entering the VVER segment in EC countries, including through the grants system allocated by the European Commission. Alongside with the increasing political pressure, the necessity increases to reduce the power dependence on Russia, diversification of supply sources, which can be used as a means of competition restraint. Customer satisfaction is of highest priority for TVEL Fuel Company.

The assets of TVEL FC in all process cycles of nuclear fuel fabrication offer its customers package deals at NF market with flexible terms and conditions.

Distribution of TVEL FC assets in different regions of Russia renders effective cooperation in a wide range of issues and aspects.

NUCLEAR FUEL FABRICATION MARKET

Today it is uncontroversial that the creation of TVEL JSC was the only right way forward. Since its first days, the Company has addressed such challenges as building an effective management system, increasing the robustness and improving the competition capacity of enterprises while giving the priority to the modernization of production, technical re-equipment and introduction of advanced technology.

TVEL Fuel Company comprises the enterprises engaged in separation-sublimation and fabrication cycles enabling the Company to offer NF products and services in the form of package deliveries. Ultimately, it contributes to flexible contract pricing and optimized transport logistics. With a number of enterprises in each NF cycle, the Company is able to make highly reliable deliveries.

TVEL Fuel Company is sufficiently competent to supply fuel for reactors designed in Russia, light-water Western-design reactors (PWR and BWR), and components for pressurized heavy water reactors (PHWR) abroad. The Company successfully manufactures nuclear fuel from reprocessed uranium in compliance with the European regulations for manufacturing technology and the products manufactured.

Within the framework of operations on expansion of TVEL JSC positions in global markets of nuclear fuel cycle in 2015, a number of documents were signed with nuclear agencies of Argentina, Indonesia and the Republic of Korea, providing a background for cooperation in the sphere of NFC with the said countries.

Furthermore, the Company proceeded implementation of a number of international cooperation projects in the sphere of FE NFC cycle (see table 6), aimed at retention and expansion of the Company’s presence in nuclear fuel markets and potential expansion into new markets.

The Fuel Company boasts a number of properties indicative of its long-term sustainability in conditions of increasing competition on the international market of FE NFC products and services.
The leadership position of the Fuel Company

What countries are more attractive for TVEL Fuel Company from the perspective of long-term cooperation?

We believe these are China and India. China is the most dynamically growing economy; it has very ambitious plans to develop domestic nuclear power industry, and it is the largest market. At the moment, the Middle Kingdom operates a total of around 30 commercial reactors; this number is expected to increase to 50 by 2020, and by 2030 the country will have more than 100 power units. Notably, neither the Fukushima disaster, nor the global economic crisis could shake China’s resolve, and the country managed to maintain the nuclear power industry growth rate.

Currently TVEL Fuel Company has contracts for the supply of nuclear fuel and zirconium-based components for units 1–4 of the Tianwan Nuclear Power Plant.

In addition, we have transferred to a Chinese company the technology of producing fuel for UTVS and TVS-2M VVER reactors, and have supplied China with fuel for its CEFR, China’s Experimental Fast Reactor. We can see a colossal cooperation potential, a cooperation that may well reach beyond our internal markets and continue to the markets of third countries. The scope is vast; the two countries have enjoyed friendly relations, this is to say, the environment is quite favourable.

Most of the above equally applies to our potential cooperation with India. At the moment, TVEL Fuel Company supplies fuel for the Kudankulam Nuclear Power Plant, as well as enriched pellets and natural enriched pellets. The level of cooperation and trust between the two countries is so high that it is beyond any doubt that the cooperation will continue on a mutually beneficial basis.

Have the political sanctions affected the international cooperation of TVEL Fuel Company?

We should bear in mind that there have been no direct sanctions against the Russian nuclear power industry. On the one hand, it is a blessing. On the other hand, it is a curse. The positive aspect is that we do not have to act under any restrictions. Meanwhile, certain implicit restrictions may be applied to our products, and these are extremely hard to predict. This is to say, we do not always know the game that is played on the foreign markets.

It is especially true for Europe, with its different quantitative restrictions on Russian products and services.

In the recent two years, the European Union has introduced new requirements to the operators, demanding the diversification of the imported sources of nuclear fuel.

We respect any decision of our partners, if such decisions are honest and transparent, and if they contribute to the development of global nuclear power industry. Nuclear power industry is a delicate matter, safety should be the priority, and this is clearly no place for politics.

We regard the current political situation in the world primarily as a window of opportunity. For a year now, to meet the new European requirements on diversification, we have actively cooperated with our partners in Europe on creating nuclear fuel reserves. We have already signed the first contracts, and we intend to continue our efforts.

We have no fear of healthy competition in the global nuclear fuel market, and we have won many contracts in fair contest, solely due to our technological and commercial advantages. We have worked hard to create new modifications of nuclear fuel and have managed to preserve these advantages. Importantly, all the new nuclear fuel modifications must receive reference in Russia before they are supplied to our foreign partners.

We have most ambitious goals and objectives in terms of increasing our presence on foreign NFC markets in the mid-term. We realize that the VVER markets alone will not be enough for us to carry our plans to fulfillment. Therefore, our growth drivers will be the promotion and commercialization of our TVS-KVADRAT fuel and expanding our cooperation in Southeast Asia.

Last year we made great progress with our TVS-KVADRAT fuel for reactors of Western design that has already been used in real life. The new fuel uses all the best technology solutions that we developed for our TVS VVER reactors.
Agreements and contracts signed in 2015

1. Increased number of nuclear power plant operations in different parts of the world that have expressed their interest in the qualification of the Russian-made TVS-KVADRAT fuel intended for use in PWRs of Western design.

2. Memoranda of understanding signed with nuclear agencies of Argentina and Indonesia providing for the development of cooperation with the two countries in the field of nuclear fuel cycle.

3. Increased cooperation with foreign partners on the promotion of fuel and its components in a number of countries that use research reactors of Western design.

List and characteristic of international alliances and projects with foreign partners, as well as the key results in the reporting year

<table>
<thead>
<tr>
<th>Project</th>
<th>2015 results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperation with AREVA</td>
<td>TVEL JSC continues its cooperation with AREVA concerning production by MSZ PJSC of nuclear fuel and components from reprocessed uranium using AREVA technologies for European NPPs with PWR and BWR reactors. During the operation of FA made by MSZ PJSC under the contract with AREVA NP, no loss of containment has ever been registered.</td>
</tr>
<tr>
<td>TVS-KVADRAT Project</td>
<td>Continued cooperation with foreign partners on TVS-KVADRAT fuel promotion to nuclear fuel markets for research reactors of Western design. Continuation of pilot operation of TVS-KVADRAT in Swedish PWR reactor. A number of NPP operators with PWR reactors throughout the world show active interest in qualification of the Russian fuel.</td>
</tr>
<tr>
<td>Center for Technology Services ALVEL a.s. JSC Joint Venture</td>
<td>Continued successful accomplishment of the Russian-Czech Joint Project “Center for Technology Services”. Key operation areas: – experimental and analytical research under contract with VNIINM JSC; – coordination and administration of Move to Zero Fuel Failure project; – promotion of general purpose industrial products.</td>
</tr>
<tr>
<td>Uranium Enrichment Center Project</td>
<td>Successful implementation of joint Russian-Kazakhstan project on Uranium Enrichment Center establishment.</td>
</tr>
<tr>
<td>UKRTVS Joint Venture CJSC</td>
<td>Development of bilateral cooperation in nuclear fuel fabrication. TVSA and components were used to fabricate FA for the Ukrainian NPP.</td>
</tr>
<tr>
<td>Project “Fabrication Plant in Ukraine”</td>
<td>Within the year 2015 the project of nuclear fuel production set up in the Ukraine was frozen. No practical measures were put into effect due to lack of finances of Ukrainian partner. Nevertheless, TVEL JSC considers that the project is in the best strategic interests of both Company and the Ukrainian party, and is prepared to continue the project fulfillment on the previously agreed terms.</td>
</tr>
</tbody>
</table>

Poland

Contracts signed for the supply of TVS and zirconium-based components for the “Maria” research reactor.

Bulgaria

One reload of TYSVA-12 new generation fuel was supplied for the Kozloduy NPP. The loading was scheduled for 2016.

India

Contract signed for the delivery of fuel pellets for the Tarapur Atomic Power Station that operates BWR reactors.

Iran

Contract signed for the export of enriched uranium product (EUP) from Iran in exchange for supplies of natural uranium from Russia.

Czech Republic

Contract signed for the supply of fuel for the Temelník and Dukovany NPPs.

Ukraine

Program for the supply of nuclear fuel for Ukraine’s nuclear power stations implemented in full despite the high risks of delayed payment for TVS fuel by NNGC Energoatom.

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