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**TENEX Logistics:
From supporting activity to Global Provider of Transport Services**

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Abstract

There is practically main regular supplier and operator in Russia, who supplies uranium material all over the world under international trade contract - Joint Stock Company “Techsnabexport”, known as foreign trade company TENEX.

TENEX is a company of the Rosatom State Corporation that comprises transport and logistics, service and engineering subsidiary companies in Russia, and trading subsidiaries in Switzerland, UK, Japan, Republic of Korea and USA.

TENEX currently supplies uranium products to 30 companies in 16 countries worldwide with a practically 50-year experience.

The safe secure and sufficient transportation uranium material is effected by many factors within the transportation system and safety and security requirements and recommendations of IAEA and the Russian Federation. The decisions of problems of shipments, including international, administrative and state control for safety and security measures during internal and international shipments will be considered and represented.

Our products are:

- enriched uranium;
- uranium enrichment services;
- uranium conversion services;
- logistics and engineering services in nuclear fuel cycle.

This paper will represent logistics enhancement program of TENEX for the ways of shipment uranium products on the world transport and service market, which include:

- packaging purchase and service;
- diversification of the ways of shipment;
- operation through material accounts; foreign obligated feed processing;
- long term cooperation and alliance arrangements with western transportation companies;

The key issue of the submitted presentation is to share our experience in diversification of sea routes and the successful cooperation with Vostochny stevedoring company. The main idea is to show the possibility of transportation from Russian Far East sea port to Pacific Rim countries as well as the transit opportunities from West to East through the territory of Russian Federation.

TENEX: Key Areas of Activities

Export of Russian NFC facilities products:

- Uranium enrichment services
- Low enriched uranium product (EUP) in the form of uranium hexafluoride
- Low enriched uranium in the form uranium dioxide
- Uranium conversion services
- Enriched uranium for research reactors
- Other uranium materials (enriched uranium in the form of uranium oxide concentrate, etc.)

Market Infrastructure Development

- Shipment points diversification – Far East Route
- Optimization of the Material Accounts System at fuel fabricators and converters
- Development of Material Accounts System in Russia
- Transport Equipment Park establishing
- Packaging Handling Center establishing

Table 1. TENEX' Share of the World Market: 24% *

NORTH AMERICA	
USA, Mexico	41% **
EUROPE	
France, Germany, Spain, United Kingdom, Belgium, Sweden, Finland, Switzerland, Ukraine	33% **
ASIA, AFRICA, MIDDLE EAST	
Japan, South Africa, Republic of Korea, China, UAE	26% **

* as of 2015

** of the total volume of export

TENEX Global Presence

Customer base:

→ Europe (France, Germany, Spain, UK, Belgium, Sweden, Finland, Switzerland)

→ America (USA, Mexico)

→ South Africa, UAE

→ South Korea, Japan, China



TENAM Co.
(Washington, USA)



INTEREXCO GmbH
(Zug, Switzerland)

TRADEWILL Ltd.
(London, UK)



TENEX-Korea Co.
(Seoul, South Korea)

TENEX-Japan Co.
(Tokyo, Japan)



Logistics Development: Why Now?

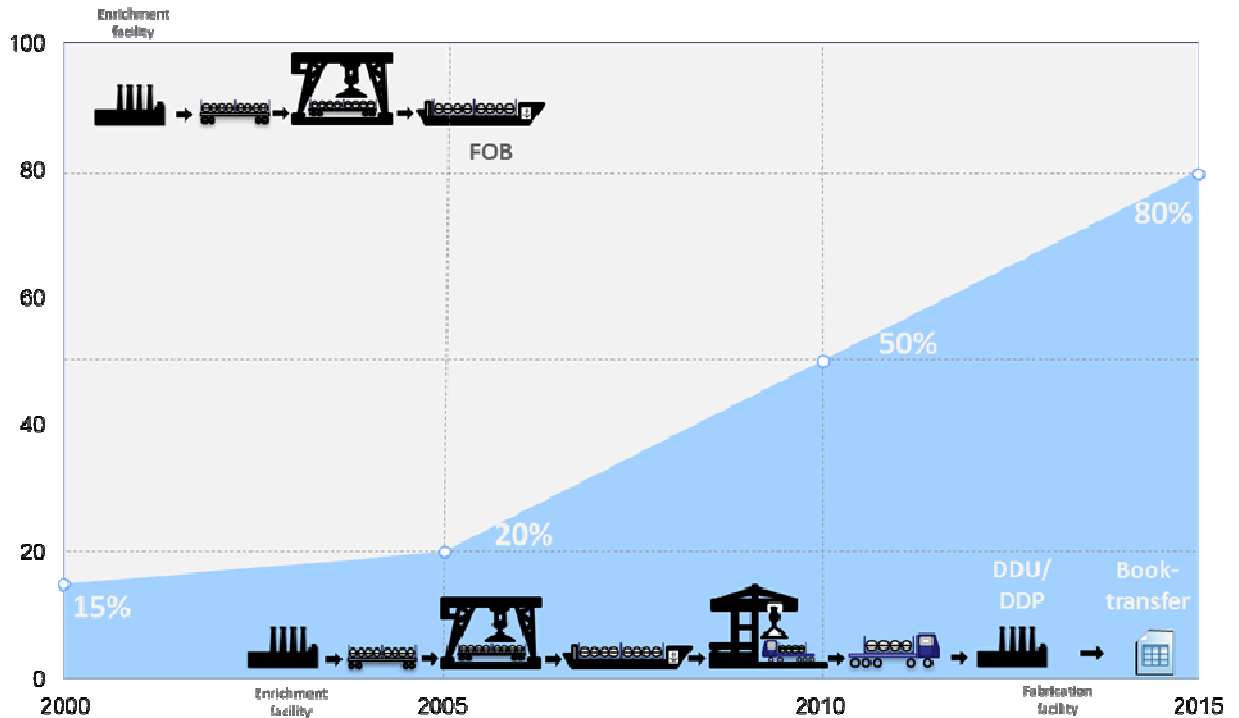
World NFC Market significantly changed since past decade – New Challenges for the Suppliers

World NFC Products Suppliers has to manage Logistics to be Competitive in the New Market Conditions

Global Back-End Market: New Possibilities in NFC Logistics.

Delivery Terms Modification – TENEX' Experience

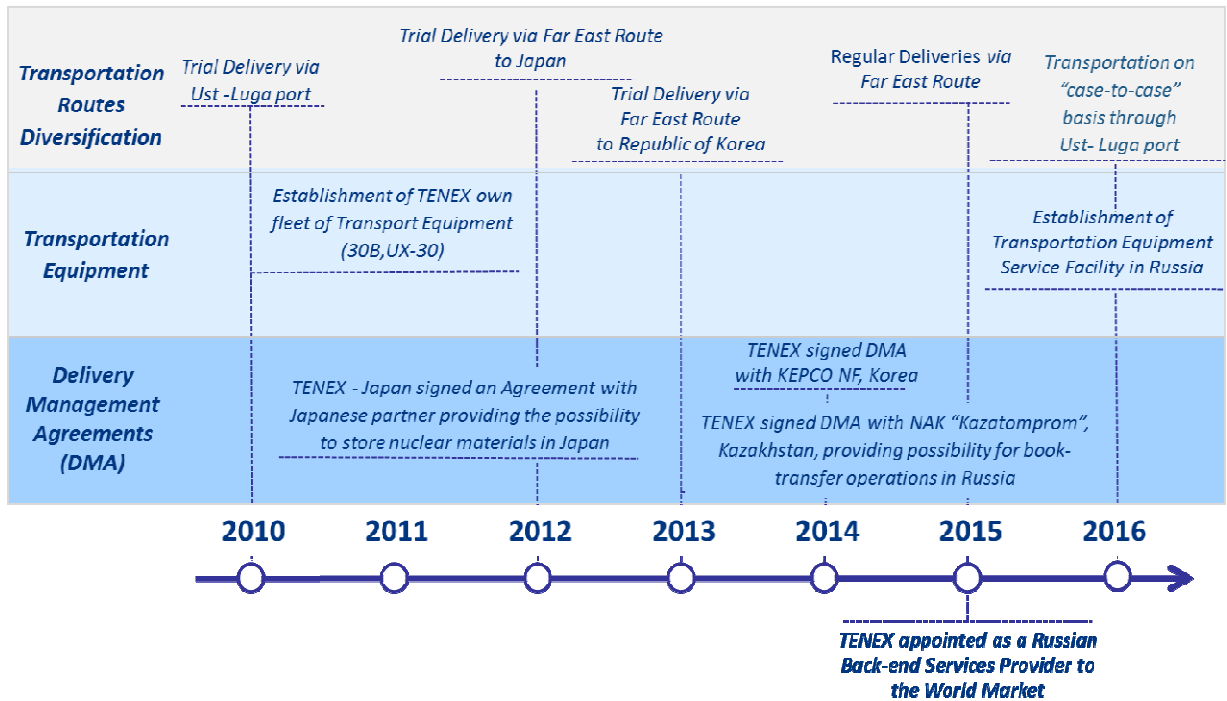
Figure 1. Delivery terms modification chart



Delivery terms modification factors:

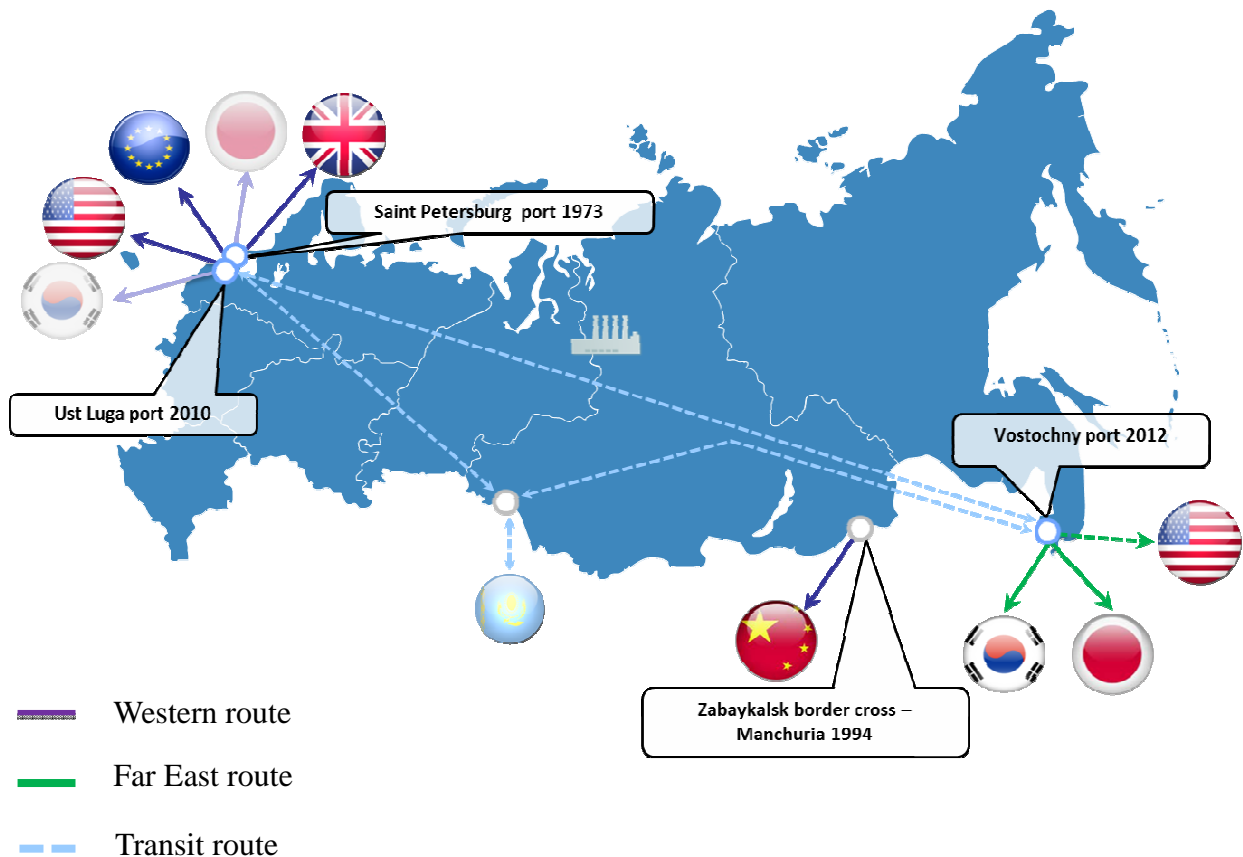
- Transportation Volumes Decrease
- Competitiveness Increase
- Customer Requirements Modification – Typical for all Logistic Services Market Participants

TENEX Logistics Development



Transportation Routes Diversification

Figure 2. TENEX Uranium Products Transportation Routes



Transport Equipment Service Facility

Transport Equipment Service Facility in Russia (opened in June 2016) provides:

- Full cycle of services for transport equipment for UF6:
 - Cylinder 30B and 48Y washing services
 - Cylinder recertification services
 - Pneumatic and/or hydraulic pressurization tests
 - Cylinder surface restoration
 - Valves inspection;
- Certificated staff (National Board certification)

Effects:

- Independence from logistics service suppliers – increase of logistics reliability
- TENEX Cylinder fleet service costs and time decrease
- Possibility to render transportation equipment services for domestic and foreign partners

Transport Equipment

Enriched UF6 (EUP)

30B Cylinders and protective overpacks.

Currently TENEX' Cylinders own fleet (for enriched uranium transportation) consists of 604 x 30B (with plans to increase 30B Cylinders amount up to 764 by 2017) and 344 x UX-30 overpacks.

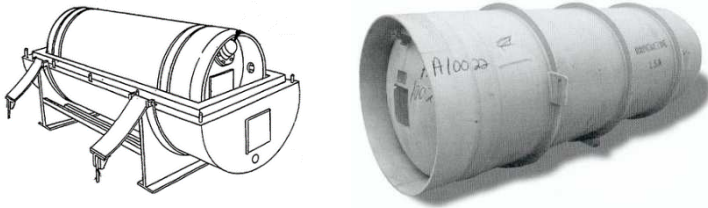
Natural UF6

48Y Cylinders.

Cylinders own fleet for natural uranium transportation plan to consist of 486 x 48Y cylinders.

Effects:

- ✓ Reliability of transportation
- ✓ Economics
- ✓ Independence from logistics services suppliers

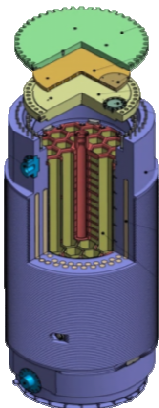


Establishment of own transportation Cylinders fleet includes design of equipment for three-level storage, spare parts and sample tubes stock

Spent Fuel

Spent Nuclear Fuel Storage and Transportation Casks:

- December 2015 - TENEX appointed as a Russian Back-end Services Provider to the World Market,
- Currently TENEX' studies the possibility of Russian design SNF casks promotion at world SNF storage and transportation market,
- Russian SNF cask solution shall accumulate best world practices while being economical.



Material Accounts System Development

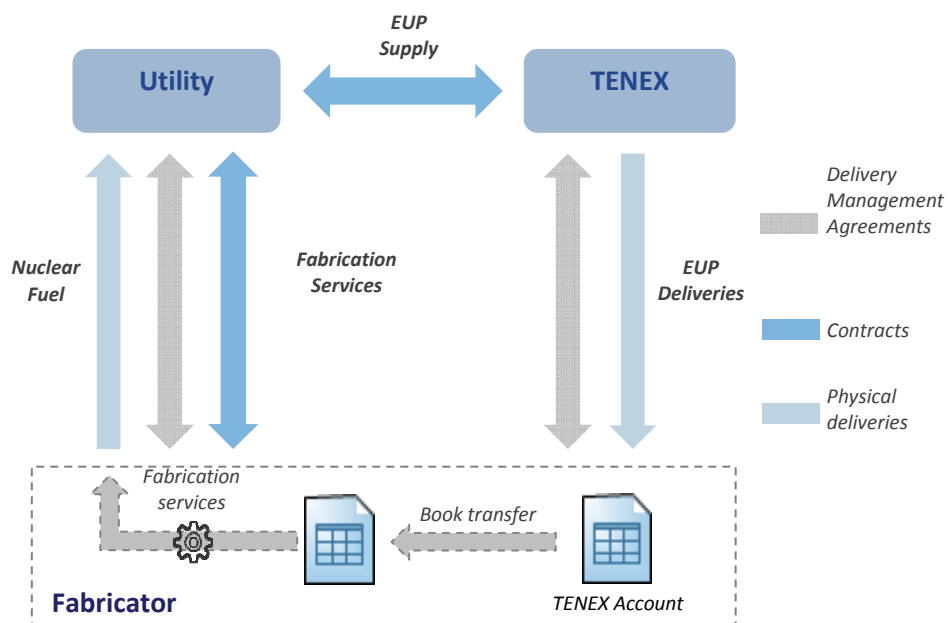
- Complex development of EUP deliveries through material accounts
- Development of material accounts system in Russia
- Establishment of EUP stock's and logistic chain optimization

Effects:

- Ensuring of compliance DMAs to the new requirements of customers and TENEX
- TENEX's DMA* portfolio increase
- Possibility to deliver "Standard Assays" EUP
- Decrease of transportation equipment turnover time

* DMA – Delivery Management Agreement

- ✓ TENEX has material accounts at NFC facilities all over the world (North America / Europe / Asia-Pacific Region),
- ✓ TENEX has experience on establishing of Material Account System at non-Russian Fabricators.



Further Logistics Development

