

Chapter 2: Transporting oil and gas in Northwest Russia

For your information:

A **Continental shelf** is the flattened part of the underwater, outlying bedrock adjoining the mainland which is characterised by a common geological formation.

This chapter presents information on the existing system for transporting oil and gas in Northwest Russia. It provides a description of oil and gas transport routes from the fields in the Timan-Pechora province, which currently represents the main source of fossil fuels in Northwest Russia, as well as from several fields on the Arctic shelf. This chapter examines the various methods for transporting oil and gas: by pipeline, by rail in tank wagons, and by sea using tankers. Information is presented relating to the volume transported and the operating companies, and the routes of the transport. Furthermore, the manner in which coastal and harbour terminals operate is also described, including their locations, operating companies, and capacities of the terminals, amongst others. The principal oil transshipment operations in Northwest Russia are identified.

This chapter also provides a description of projects planned for extending and increasing the capacity of the oil and gas transport system in Northwest Russia, in accordance with the basic strategies for Russia's development for the period up to 2020. The following projects, which are planned to be implemented in the near future, are examined: the transportation of natural gas from the Shtockman field, as well as from the Bovanenkov and Kharasavey fields; the transportation of oil from the Prirazlom field; the Kharyaga-Indiga oil pipeline and the oil terminal in the port of Indiga; and the oil transshipment complex and oil reprocessing plant in the port of Lavna. Basic data is provided concerning the technical and ecological parameters of these projects. This chapter will neither analyze the environmental consequences of the transportation nor account for the consequences if an accident takes place in the Russian north. This information can be obtained in the chapters "Environmental risks when extracting and transporting oil and gas" and "The impact on nature when conducting oil and gas activity" of this report. We also recommend the chapter "Accidents and Incidents – causes and consequences". The information presented in the current chapter is accompanied by reference data, opinions from specialists, legal notes and illustrations.

For your information:

Russian production: The domestic market consumes approximately 2/3 of the gas extracted, while 1/3 is exported. Last year Russia exported 159,8 billion cubic meters of gas, of which 27,4 billion cubic meters went to former Soviet republics. Russia exported 233.147 million tons of oil, of which 18.711 million tons went to former Soviet republics.

2.1. State regulations and strategies

In accordance with **Russia's Energy Strategy for the Period up to 2020**, it is the Russian government's intention to increase the production volumes of gas (by up to 10%) and oil (by 3-6%) by commissioning new fields on the Continental shelf in East and West Siberia.¹ This, in turn, will lead to the need to increase transport capacities: the construction of port terminals and the development of main pipeline systems.

Russia's Energy Strategy for the Period up to 2020 represents the main document which strategically defines the process for developing the oil and gas complex in Russia. In its most recent version (from 2003), the priorities in terms of developing a fuel and energy complex are as follows: increase the export potential of the oil and gas complex, denationalise this complex, and employ rational resource management.

This entails ensuring identical benefits when opening up reserves which vary in terms of quality, stimulating development of reserves which are difficult to extract, and restricting the minimum and maximum levels of production.

In practice, the opposite developments are observed of those specified in the strategy. The activities of oil and gas companies are focused on oil extraction at minimal expense. The absence of economic stimulus and government regulation lead to selected extraction from the most productive reserves, a decrease in the

Here's a thought...

"Three energy strategies have been written during Russia's brief post-Soviet history. Declaring a commitment to basic values, such as energy self-sufficiency and security of the country, energy saving and a reduction in the negative impact on the environment, each new version of the strategy changes, along with the quantitative parameters, the principles of State policy. It may be that all three documents are combined into just one - not one of them has become a guide for authorities or for business ..."²

¹ "Neftegazovaya vertikal" - No. 18/2005 - "Energy strategies: blurred lines of reference"

² "Energy strategies: blurred lines of reference", "Neftegazovaya vertikal" - No. 18/2005

extraction ratio of oil and irretrievable losses of a portion of the oil reserves. The absence of a culture and a framework for rational nature management in Russia leads to an increase in pressure on the environment. This confirms the discrepancy between the priorities specified for development of the oil and gas industry in the strategy and the real politics of the government and the company. Monopolisation and state intervention in the oil and gas sector only reaffirms this tendency.

For your information:

Russia's Transport Strategy for the Period up to 2020: Transport strategy regulations form the basis for a common understanding of the modern role of transport and the prospects for its development by executive and legislative authorities. The strategy also provides guidelines for making decisions on the reform, financing, regulations and development of transport. This strategy was developed by the Ministry of Transport and adopted by the Government of Russia in 2005.

national maritime policy⁴, shows that in the north of the country, large-scale installations which guarantee the transport of petroleum by sea are either already established, or at various stages of planning and construction. These include for example:

For your information:

The Maritime Doctrine of the Russian Federation for the Period up to 2020 was ratified by Decree of the President of the Russian Federation NoPR-1387 of July 27, 2001 and expresses the main direction of national maritime politics, including in the country's regions.

The national maritime policy on the Arctic region is defined by the following factors: the particular importance of ensuring free access of the Russian Fleet to the Atlantic Ocean, the wealth of the exclusive economic zone and continental shelf of the Russian Federation, the decisive role of the Northern Fleet for state defence on the seas and the oceans, and the growing significance of the Northern Sea Route for the sustainable development of the Russian Federation.

The basis of national maritime policy consists of creating conditions for Russian Fleet activity in the Barents, White and other Arctic Seas, in the corridor of the Northern Sea Route, and in the northern portion of the Atlantic Ocean.

- tanker transport systems for ensuring the export of oil and petroleum products to international markets: the oil transshipment complex in the port of Lavna (Murmansk oblast), the terminal in the port of Indiga, the development of the Murmansk transport terminal, and so on.

Here's a thought...

According to the Chairman of the Committee of natural resources and environmental protection in Murmansk oblast, Nikolai Bichuk, the volume of oil transported in the region will grow to 20-50 million tonnes per annum by 2010.⁵

In addition, the Russian Government is planning to adopt a **General Plan for Developing Pipeline Transport** for the period up to 2020. According to this plan, the main strategic objective will be an increase in the capacity of the pipeline system.⁶ However, in practice, the low growth rate in reserves of oil and gas, and the implementation of the already existing large-scale oil and gas projects, raises doubt about the possibility of ensuring such abundant shipment capacity with necessary raw materials. This in turn raises the question about the rational expansion of conducting capacity in the pipeline system in the absence of clear prospects for real filling of oil pipes.

Russia's Transport Strategy for the Period up to 2020 decides and regulates the transport infrastructure of the country's oil and gas complex, the need to establish new export routes, the availability of a sufficient reserve for transit capacity and the possible expansion of pipeline transport.³

An analysis of regional directives adopted by **The Maritime Doctrine of the Russian Federation**, Russia's

- large-scale pipeline systems: the North Europe Gas Pipeline (NEGP) (Fig. 1. Route of the North Europe Gas Pipeline), the pipeline system from the Shtockman gas condensate field, the Kharyaga-Indiga oil pipeline, the Yamal-Centre gas pipeline (Fig. 2. Route of the Yamal-Centre gas pipeline) and so on;

For your information:

The North Europe Gas Pipeline (NEGP)

Length - 1200 km

Capacity - 55 billion cubic metres per annum

Area - the route goes overland as far as Vyborg, then along the bottom of the Baltic Sea to the coast of Germany. The NEGP traverses the territorial waters of Russia and Germany and also the exclusive economic zones of Finland, Sweden and Denmark.

Operator - the joint Russo-German company NEGPC, although the controlling interest lies with the state controlled company "Gazprom"

Raw materials base - the oil and gas fields from the southern regions of Russia. In the longer term, extraction from fields on the Yamal Peninsula, in the Bays of Obsk and Tazov, and the Shtockman field, are proposed for additional raw materials.

Timeframes for commissioning - stage one, 2010; stage two, 2013

Special features: the route taken by the NEGP passes along the bottom of the Baltic Sea, which is notable for its complex relief and blocked by chemical munitions and conventional ammunition dumped during the Second World War. This significantly raises the ecological risks when constructing and operating the gas pipeline.

³ "Russia's transport strategy for the period up to 2020", approved at the sitting of the State Council of the Russian Federation on 29 September 2003

⁴ S P. Alexeev, A.N Dobrovorskiy, S.V. Yaitenko "Regional integrated system for guaranteeing safe maritime activities"

⁵ <http://www.aviafond.ru/oil.php?day=2006-02-27&number=10>

⁶ www.rusenergy.ru

For your information:

The European Energy Charter was adopted by EU States in the Hague December 17, 1991. The purpose was to develop an efficient energy market throughout Europe. The parties which are signatories to the Charter must undertake activities to ensure co-ordination of their energy policies, collaboration and exchange of opinions. Access to energy resources and their development must be made easier for interested operator developers. Foreign investment must be stimulated and protected.

According to agreements between Russia and EU, European investors are to have the same access to the Russian energy market that Russian companies have to Europe's market, as well as the ability to export any gas and oil they produce in Russia. However, Federal Law No. 177 "regarding gas exports" assigns to Gazprom (or its wholly owned subsidiary) the exclusive right to export all forms of gas from all Russian fields. "This law sums up the controversy regarding ratification of the

Energy Charter and the transit protocol - There is no sense in it continuing", argues Oleg Zhilin, Vice-President of the Russian Gas Committee.^[1] Thus, "Russia will not waive Gazprom's monopoly to transport gas but will ensure that independent producers have access", declared V. Putin. These questions will further intensify the contradictions in the energy sphere between Russia and the EU. Russia has so far failed to ratify the charter. According to euobserver.com MEPS in the European Parliament's foreign affairs committee said in early September 2007 that the EU should only support Russian membership of the World Trade Organisation (WTO) if it adheres to the Energy Charter Treaty.

Comments by a legal expert:

Russia participates in the following international conventions regulating transportation of oil and gas:

- The 1954 International Convention on the Prevention of Pollution of the Sea by Oil. This convention entered into force in Russia on 03.12.1969.
- The 1969 International Convention on Civil Liability for Oil Pollution. This convention entered into force in Russia on 22.09.1975.
- The 1969 International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties. This convention entered into force in Russia on 06.05.1975.
- The 1992 Convention on the Transboundary Effects of Industrial Accidents. This convention entered into force in Russia on 19.04.2000.
- The Law of the Sea Convention, 1982. This convention entered into force in Russia on 11.04.1997.
- The 1992 Convention on Biological Diversity. This convention entered into force in Russia on 29.12.1993.
- The 1991 Convention on the Environmental Impact Assessment in a Transboundary Context (The Espoo Convention). This convention came into force 10.09.1997.
- International Convention for the Prevention of Pollution from Ships. (MARPOL 1973 AND 1978)

2.2. Existing transport systems in Northwest Russia

2.2.1 Transportation of gas

Here's a thought...

"No norms exist which determine the period of use of gas pipelines. We are hoping that the Vidyaevo-Volokhov gas pipeline will give 50 or 100 years of service, or even more!", declared A.S. Piotrovskiy, chief engineer for the project concerned with the integrated development of the Shtockman gas condensate field, during public hearings in Apatity, Murmansk oblast (19 September 2006).

Natural gas which is produced in Northwest Russia enters the main gas pipelines which join Russia's Unified Gas Supply System (UGSS). The UGSS is 155,000 km long. It houses 268 compressor stations and the total capacity of the gas pumping units is 44.8 million kilowatts. Russia's Unified Gas Supply System is the property of Gazprom.⁷

For your information:

Oil and gas pipelines are made of steel. They usually last for 20-40 years. The estimated lifetime and thickness of the pipelines depend upon the level of sulphur (H₂S) in the gas; the more sour the gas, the shorter the estimated lifetime for the pipe. Only pipes made of stainless steel do not corrode. However, these are very expensive. Natural gas may contain up to 28% sulphur, H₂S. This gas is highly toxic and is considered sour if the level exceeds 5,7 milligrams per cubic meter.

As of December 31, 2005, the average period of use of main pipelines is 22 years.⁸

In 2005, 31 independent producers had access to the gas transport system. The tariff for independent producers when transporting gas through the main gas pipelines owned by Gazprom is determined by the following Federal executive authorities in the Russian Federation:⁹ the Federal Tariff Service and the Department for State Regulation of Tariffs and Infrastructure Reform within the Ministry of Economic Development.

^[1] www.oilcapital.ru

⁷ www.gazprom.ru

⁸ www.gazprom.ru

⁹ www.gazprom.ru

For your information:

According to the results of geological survey work, three regions with commercial oil and gas in northwest Russia reserves have been singled out for exploration¹⁰

- **The Pechora Sea region - oil-bearing:** the Varandey, Dolgin, Medyn and large-scale Prirazlom oil fields; the Severo-Gulyaev and Peschanoozer oil and gas condensate fields; and the Pomor gas condensate field;
- **The central Barents Sea region - gas-bearing:** the Ludlov, Severo-Kil'din and Murmansk gas fields, as well as the Ledov and the Shtockman gas condensate fields;
- **The south Kara Sea region - gas-bearing:** The Leningrad gas and Rusanov gas condensate fields; and four gas fields in the Bays of Obsk and Tazov.

Three areas in the region have been singled out as having commercial gas reserves, (see information on this page). According to Gazprom, development of the fields in the Bays of Obsk and Tazov will begin around 2010. Gas production is expected to exceed 80 billion cubic metres per annum by 2021.¹¹ Gazprom's proposed scenario for developing the facilities envisages construction of installations for integrated gas preparation, after which the gas will be transported on to the Yamburg gas compressor station for supply to the existing main gas pipeline system.¹²

The shelf of the Kara oil and gas-bearing province has not been studied in detail. Consequently, there is no commercial production or transportation at the moment. However, Gazprom is planning to conduct a detailed field appraisal of the fields in the south Kara region and prepare them for development (fig. 3 Kara Sea)

Ultimate potential gas resources in the Barents Sea amount to 21.6 trillion cubic metres.¹³ However, there is no commercial production or transportation at the present time. In terms of development, the most promising field in the Barents Sea is the Shtockman gas condensate field. A description of the transport and technology system for implementing this project is presented in detail in section 2.4 "Planned systems for transporting oil and gas in Northwest Russia".

2.2.2 Transportation of oil

Here's a thought...

"7.9 million tons of oil and oil products were transported in 2005 through the ports of the White and Barents Seas, 9.3 million tons – in 2006. In 2010 – 21.4 million tons are planned to be transported" – says Vladimir Baharev, Head of the "Harmonic Development" foundation, speech at the opening of the Barents Training and Response Centre in Murmansk in 2007.

At present, bulk oil loads are mainly transported in the form of crude oil, or residual fuel oil, which is conveyed by rail and pipeline to ports on the White and Barents Seas. From these ports the oil is transferred to tankers for subsequent transportation by sea to the western market either directly, or through oil transshipment complexes in the Kola Gulf (Fig. 4

"Ways of transporting oil and gas in the north of Russia").

Transport by pipeline

Around 95% of the oil extracted in Russia is pumped through the main oil pipeline system of the "Transneft" company, a state company founded by the Government of the Russian Federation.¹⁴ Transneft has the capacity to transport approximately 545,000 tons of oil per day; this is about 60% of the total export of oil and gas in the country. The rest is transported by rail or ship¹⁵.

¹⁰ "The opening up of hydrocarbon resources on the shelves of the Arctic and Far Eastern Seas: the past, present and future" - Neftyanoe Khozyaistvo, 06/2005

¹¹ "Development of a gas transport system for removing gas from fields in the north", B.V. Budziliak, R.M. Ter-Sarkisov, E.V. Leontev - Gazovaya promyshlennost, 06/2004

¹² Results of the work conducted by Gazprom and preparation for development of gas resources in the waters of the Bays of Obsk and Tazov in the Kara Sea and the prospects for field development, B.A. Nikitin, V.S. Vovk, the "Gazprom" public company, A.Ya. Mandel', V.A. Kholodilov, the "Gazflot" limited liability company. RAO/CIS OFFSHORE 2005

¹³ Oil and gas resources in Russia's north-west region and the future prospects for its development, M.D. Belonin, O.M. Prishchepa (All-Union scientific research and geological exploration institute)

¹⁴ "The transportation of oil from the Russian sector of the Barents Region", A. Bambuliak, B. Frantzen - Svanhovd Environmental Centre

¹⁵ US Energy Information Agency

The main pipelines from west Siberia and the Timan-Pechora province (“Ukhta - Yaroslavl - Kirishi” and “Surgut - Yaroslavl - Polotsk”) supply oil to Yaroslavl, which is one of the principal centres in the transport network supplying oil to northern Russia. From Yaroslavl, oil and petroleum products are transported to Arkhangelsk, Murmansk and the port of Vitino by railway.

Here’s a thought...

Within ten years, the export capacity of “Transneft” will increase from the current level of almost 20 million tonnes per annum to 49 million tonnes. This will account for approximately 16% of the total planned capacity of the main oil pipeline system.¹⁶

In addition, oil is supplied to Primorsk along the existing system of main pipelines between “Ukhta - Yaroslavl – Kirishi.” From Primorsk, oil is transported by tanker on the Baltic Sea to countries in Western Europe. Oil is supplied to countries in Eastern Europe using the “Surgut - Yaroslavl - Polotsk” main pipeline system. (Fig. 5 Chart

showing the main oil pipelines operated by “Transneft”¹⁷)

Here’s a thought...

In Siberia, 1-2% of total oil production leaks out and pollutes the environment due to out-dated technology, pipeline ruptures, etc., but in the North Sea only 0.001 % of oil is lost.¹⁸

Fig. Chart showing the main oil pipelines operated by “Transneft”

Transport by railway

Oil destined to be exported from the region is transported to Arkhangelsk, Murmansk and the port of Vitino (Gulf of Kandalaksha) and Kandalaksha by the northern railway which intersects the oil pipelines discussed above.

For your information:

Russia’s northern railway runs north, north-east along the territory of the Yamalo-Nenetsky Autonomous District, Komi Republic, Arkhangelsk, Vologod, Kostrom, Ivanov and Yaroslavl oblasts. The working length of the route is 8508 km.¹⁹

¹⁶ www.rusenergy.ru

¹⁷ www.transneft.ru

¹⁸ Russian anonymous researcher in an interview in the article *Environmental Perceptions in northwest-Russia Internasjonal politick* 65 (1) 2007:

7-22

¹⁹ “The transportation of oil from the Russian sector of the Barents Region”, A. Bambuliak, B. Frantzen - Svanhovd Environmental Centre

Oil which is extracted from fields in the Timan-Pechora oil and gas-bearing province is supplied via a branch of the “Usa - Ukhta” pipeline system to the oil transshipment railway terminal at Privodino station, in the Kotlassk region of Arkhangelsk oblast. Here, raw materials are transferred to tank wagons and dispatched to Rosneft’s sea terminal in Arkhangelsk. (Fig. 6: Absorption plant for recovering light hydrocarbon fraction, “Rosneft-Arkhangelsknefteprodukt” oil company in Privodino)

**For your information:
Railway freight handling terminal at Privodino station:²¹**

Region - Arkhangelsk oblast
In operation since- 2004
Cost - 2.3 billion roubles
Capacity - in excess of 4 million tonnes of oil per annum
Special features: the terminal is equipped with a modern environmental cleaning system: reservoirs with double side walls and a double bottom.

In accordance with the development plan for the Arkhangelsk terminal up to 2008, the “Rosneft-Arkhangelsknefteprodukt”

company plans to increase freight turnover involving petroleum products up to 10,200,000 tonnes per annum. This increase will occur gradually: The volume of petroleum products transported is expected to reach 7 million tonnes per annum in 2006, with a planned increase to 8.5 million tonnes per annum envisaged for the second stage (by 2007). By 2008, freight transport will increase to 10,200,000 tonnes of petroleum products per annum.²²

Through Murmansk, the volumes of oil transported for export exceed 10 million tonnes per annum. A further increase in these volumes is proposed since the capacity to convey 20 million tonnes of oil per annum has already been established on the Kola Peninsula.²³

Petroleum products are supplied to the port of Vitino by railway tank wagons from the oil reprocessing plants in the towns of Yaroslavl (“Yaroslavnefteorgsintez”), Nizhny Novgorod (“Nizhnegorodskiy organicheskiy sintez”), Nizhnekamsk (“Nizhnekamskiy oil refining plant”), Perm (“Permnefteorgsintez”), Ufa (“Bashneftekhimzavody”), and Samara (the oil refining plant in Samara). (Fig. 7 The port of Vitino). Crude oil obtained from fields in Timan-Pechora province, which arrives by train from the town of Ukhta, is also transhipped in the sea port of Vitino.²⁴

Transport by sea

Oil is exported by tankers from Arkhangelsk and Murmansk, and the ports of Varandey (Pechora Sea) and Vitino (White Sea).

Here’s a thought....

More than a quarter of the oil and gas supplied to the EU comes from Russia. Russia is a major supplier of raw energy materials and therefore a main market for European services and production. “Russia is as much dependent on the EU as the EU is on Russia”, according to the Danish liberal, Anne Jensen. She suggests that the prospects of Russia joining the WTO will entice the country to sign the Energy Charter.²⁵

Oil extracted by the companies “Arcticneft” and “Arcticmorneftegazrazvedka” from fields on the Kolguev Island in the Barents Sea is either exported directly by tanker or through the coastal transshipment complex in the Kola Gulf. (Fig. 8 the Kolguev Island)

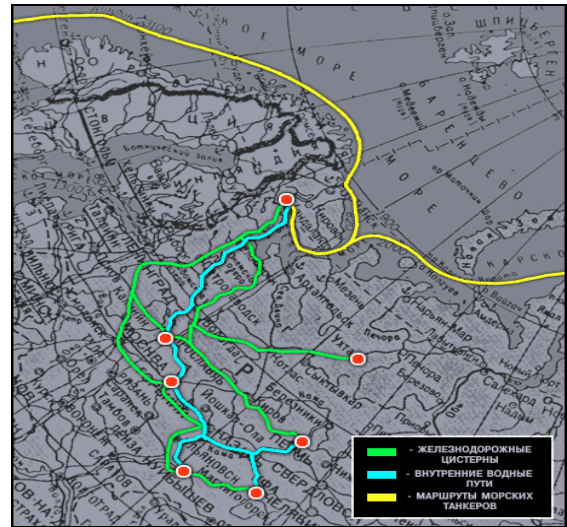


Fig. Chart showing shipments and freight transport through the sea port of Vitino (Gulf of Kandalaksha)²⁰

²⁰ www.vitino.ru

²¹ www.oilcapital.ru

²² www.oilru.com

²³ “Large volumes of oil - an easy path”, Yu. Banko - “Murmanskiy Vestnik”, 2 September 2006

²⁴ www.vitino.ru

²⁵ www.europarl.europa.eu

Oil from the northern fields in the Nenetsky Autonomous District reaches the oil storage tank of the “Naryanmarneftegaz” limited liability company via a system of local pipelines. This storage tank is linked to the bulk oil terminal in Varandey, from where oil and gas are dispatched for export by tanker through the coastal transshipment complex in the Kola Gulf (See Table “Offshore and coastal terminals”).

From the fields in the Bay of Obsk, oil is supplied by river tanker to the “Severomorsk” tanker holding lagoon in the Kara Sea (displacement - 39,000 tonnes) which belongs to the “Joint shipbuilding company” based in Murmansk (Fig. 9 The “Severomorsk” tanker). In addition oil is exported using shuttle tankers escorted by an ice breaker.²⁶

For your information:
The Varandey bulk oil terminal
Location - Pechora Sea
In operation since - 2000
Capacity - 1,500,000 tonnes
Operators - “Lukoil”, “Murmansk Shipping Company”
Service responsible for eradicating hazardous oil spills - “Murmansk basin emergency rescue service”

Table 1. Oil transshipment operations in Northwest Russia²⁷

Oil transshipment operations		Volumes (thousands of tonnes per annum)	
Location and route	Characteristics	2005	2010
Murmansk	Transshipment of oil from railways	2000	6000
Varandey terminal	Loading of oil to tankers through sea pipelines and terminals	2500	12000
Pechora Sea - Kola Peninsula	Transporting oil by tanker	2500	14700
Arkhangelsk	loading of oil and diesel fuel on to tankers from the offshore terminal	3200	6000
The port of Vitino	Unloading of oil and gas condensate from the offshore terminal	3500	6000
White Sea - Kola Peninsula	Transporting oil by tanker	6700	12000
Kola Peninsula	Unloading of oil to export tankers	9200	26700
Bay of Obsk - “Severomorsk” tanker holding lagoon	Transporting oil by tanker	350	No data
Kolguev Island - Kola Gulf	Transporting oil by tanker	100	No data

Here’s a thought....

The commander of the headquarters of Norway’s national armed forces, Lieutenant-General Torsten Schiaker, has expressed Norway’s serious misgivings about the increased number of shipments of petroleum products by sea through ports located in northern Russia. The General stresses: “The growth in the number of tankers moving along the coast of Norway makes the probability of an environmental catastrophe similar to the accident involving the Prestige a very real danger.”²⁸

For your information:

In March 2006, Norway and Russia signed a bilateral agreement on mutual understanding and cooperation in safety at sea. The agreement proposes the establishment of a common system for monitoring and surveillance of oil transportation in the north, Barents VTMISS. (The Barents Vessel Traffic Management and Informational System). The Barents VTMISS is based on data exchange about automatic

²⁶ www.b-port.com

²⁷ “The shelf does not need oil spills” - “Neftegazovaya vertikal” journal, January 2006

²⁸ <http://www.flb.ru/info/38564.html>

identification of ship (AIS-data), and will give Norway and Russia better information about vessels in the area. The traffic centrals in Vardø and Murmansk will be central in this cooperation.

The main transport routes pass along the coast of Norway in the provinces of Vestlandet, Trøndelag, Nordland, Tromsø and Finnmark.²⁹ (Fig. 10 Transportation along the Norwegian coast). The volumes of oil transported from the Russian sector of the Barents region along the Norwegian coast were insignificant for a long time. Starting in 2002, however, there was a dramatic increase in goods traffic: In 2002, 4 million tonnes of Russian oil was supplied along the Norwegian coast to the western market; in 2003, 8 million tonnes; in 2004, 12 million tonnes; and 15 million tonnes in 2005. In 2006 there was a slight decline; only 12 million tons were transported along the Norwegian coast. The estimates for 2007 are 12-14 million tons of oil. However, in accordance with preliminary forecasts, the volume of Russian oil exported by sea in this region can increase substantially in the near future.³⁰ Akvaplan-niva, a Norwegian research and consultancy centre believes that Russian oil transport along the Norwegian coast will reach 30-50 million tons by 2012.

The majority of bulk oil loads is transported to Rotterdam. The remainder goes to Germany, the Netherlands, Belgium, Great Britain, France and the USA.³¹

Here's a thought....

"...by as early as 2010, Russia will have the capacity to export up to 150 million tonnes of oil by the northern route".³²

For your information:

AIS – The Automatic Identification System provides safety along the Norwegian coast. The AIS network gives continual information about the position, course, and speed of all ships along the Norwegian coast. Information about nationality and destination is also available.

Offshore and coastal terminals (Fig. 11 “General map showing the distribution of oil transshipment terminals and transport routes in Northwest Russia”)

Table 2. Offshore and coastal terminals of the Northwest Russia

No.	Name	Location	Year of start up	Operator	Transportation	Capacity, thousands of tonnes	Service responsible for eradicating hazardous oil spills
Existing terminals							
1	Varandey	Pechora Sea	2000	“Murmansk Shipping Company”, “Lukoil”	Timan-Pechora province (pipeline system) - Varandey - Kola Gulf - export	5 400	Murmansk basin emergency rescue service
2	Kolguev	Pechora Sea	1985	The “Arcticneft” private company	The Peschanoozer oil and gas condensate field (pipeline system) - Kolguev - (Kola Gulf) - export	200	Murmansk basin emergency rescue service
3	Bulk plant in the Murmansk sea fishing port	Murmansk, Kola Gulf	2004	“Murmansk sea fishing port” (a Federal State unitary enterprise)	By rail - Murmansk bulk plant - transshipment distribution complex 1 - export	2 000	The bulk plant’s special subdivision
4	Port oil transshipment complex at the 35 th [ship repairing] plant	Murmansk, Kola Gulf	2004	“Tangra Oil”	By rail - Port oil transshipment complex - transshipment distribution complex 1 - export	3 600	The “Gidrotekhservis” limited liability company
5	Transshipment distribution	Kola Gulf	2002	“Murmansk Shipping Company”	The terminals in Varandey and Vitino,	4 300	Murmansk

²⁹ “The black gull - an emblem of ruin”, Elena Domcheva - *Rossiskaya Gazeta*, 31 March 2006

³⁰ “Co-operation: experience plus technology”, I. Polyakova - the information-based and analytical journal “Transport Rossii” - No. 3, 19 October 2006 - <http://www.transportrussia.ru/2006-10-19/ecologia/razlivnefti.html?PHPSESSID=b7dc48ceb58a0112336476530b54e5dc>

³¹ “The transportation of oil from the Russian sector of the Barents Region”, A. Bambuliak, B. Frantzen - *Svanhovd Environmental Centre*

³² “The transportation of oil from the Russian sector of the Barents Region”, A. Bambuliak, B. Frantzen - *Svanhovd Environmental Centre*

	complex 1				“Murmansk sea fishing port”, “35 th ship repairing plant” - transshipment distribution complex 1 - export		basin emergency rescue service
6	Transshipment distribution complex 2	Kola Gulf	2003	The “White Sea service” limited liability company	Activities have been suspended for the time being		
7	Transshipment distribution complex 3	Kola Gulf	2004	The “Belokamenka” limited liability company	Timan-Pechora province - Arkhangelsk, Bay of Obsk - transshipment distribution complex 3 - export	5 900	Murmansk basin emergency rescue service
8	Tanker holding lagoon in Mokhnatkina Pakhta	Kola Gulf	2005	The “Kommandit-servis” limited liability company	By rail - Mokhnatkina Pakhta - export	2 500	
10	Onezhsk Bay	White Sea	2003	The “Volgotanker” public company	Through the White Sea-Baltic Canal Activities have been suspended for the time being		The “Morskaya Liga” private company
11	“Vitino”	White Sea	1993	The “Vitino sea port” private company	Timan-Pechora province (pipeline system) - Moscow, Yaroslavl (railway) - Vitino - (Kola Gulf) - export	8 000	The special subdivision of the “Vitino sea port” private company

* This table has been compiled using data from the report drawn up by the Svanhovd Environmental Centre entitled “The transportation of oil from the Russian sector of the Barents Region”, A. Bambuliak, B. Frantzen (2005/ 2007). (Fig. 12 “Belokamenka”)

At the present time, reconstruction work is being carried out on the second stage of the Arkhangelsk oil terminal. The capacity of the terminal will increase from 4.2 million tonnes, to 10 million tonnes. The “Rosneft” oil company is building its tanker fleet comprising three tankers, each having a dead weight of 30 tonnes.

The “Lukoil” oil company is at present building a tationary, ice-resistant, offshore shipping terminal, with an output of 12 million tonnes of oil per annum, which will be situated in the Pechora Sea, 20 km from shore in the vicinity of the Varandey settlement. There are plans to build three tankers, with dead weights of 70 thousand tonnes each in order to export oil shipped from this terminal.³³

2.3 Navigation

In accordance with Federal Law No. 155 “regarding internal sea waters, territorial waters and the adjacent area of the Russian Federation” (dated 31.07.1998), waters in Russian ports, gulfs, bays, inlets and estuaries, the shores of which fully belong to the Russian Federation, constitute internal maritime waters.

Here’s a thought...

In the opinion of a high-ranking civil servant, intensive shipping by Russia “represents a serious, potential threat to the ecology of the Barents Sea”, inasmuch as an accident involving any water craft “may cause unforeseen and devastating consequences in the region”.³⁴

Here’s a thought...

“Tanker transport of oil and petroleum products occurs at a distance of 50-100 km from the coast along the Kola Peninsula, and 10-30 km from the coast in the Kola and Kandalaksha Gulfs” announced Vladimir Baharev, leader of the “Harmonic Development” foundation in his presentation at the opening of the Barents Training and Response Centre in Murmansk in 2007.

Here’s a thought...

The Norwegian Government enforces strict rules concerning oil and gas activities in the Norwegian sector of the Barents Sea along the coast. All oil

³³ “Large volumes of oil - an easy path”, Yu. Banko - “Murmanskiy Vestnik”, 2 September 2006

The territorial waters of the Russian Federation are designated as a 12 nautical mile wide zone adjacent to dry land, or to internal maritime waters. While recognising the rights of foreign vessels to pass peacefully through its territorial waters, the sovereignty of the Russian Federation extends to territorial waters, including the seabed and its subsoil, and the adjacent airspace.

and gas activity, including the transport of hydrocarbons, is prohibited within a 35 km zone from the shore. Activities associated with development and exploitation of new oil and gas fields are prohibited within a 50 km zone from the shore. Drilling between March 1 and August 31 is prohibited within an area of 65 km (Fig. 13 Map of limitations regarding oil and gas activities in Norway).

2.3.1 Areas closed to navigation

To ensure the safety of shipping, the protection of Russian Federation State interests, or the protection of the environment in internal maritime or territorial waters, areas can be designated closed, or temporarily perilous, to navigation. Activities such as shipping, dropping anchor, catching marine mammals, fishing,

Here's a thought...

For the purpose of strengthening navigational safety and facilitating the cleaning up of oil spills, certain navigable routes along the Norwegian coast will be introduced in 2007. In December 2006, Norway received approval from the International Maritime Organisation to establish sea routes outside Norwegian territorial waters between Vardø and Røst. A double-lane sea corridor for passing tankers will be created 30-50 nautical miles from the Norwegian coastline.³⁵

underwater operations, dredging, etc. can be prohibited in their entirety, or restricted on a temporary basis. Decisions regarding the establishment of closed maritime areas, and their subsequent opening, as well as rules relating to such areas, are made by the Government of the Russian Federation in the form of declarations from the relevant Federal executive authorities.

2.3.2 State regulation

For your information:

The International Maritime Organisation (IMO) is a specialised institution under the UN regulating safety at sea and marine conservation. At present, there are 166 member countries, including Russia. The legislative activities of the IMO are part of the normative and legal regulation of maritime transport across the globe, including in Russia.³⁶

In accordance with the “Commercial Navigation Code of the Russian Federation” (Federal Law No. 81 dated 30.04.1999), State regulation and supervision in the sphere of commercial navigation is carried out by the Russian Ministry of Transport.

Responsibility for sea routes when it comes to navigation and hydrography, is carried out by the Ministry of Defence. An exception from this is regulating the northern sea routes where the responsibility lays with the Ministry of Transport.

By Order of the Ministry of Transport of the Russian Federation “regarding approval of the provisions concerning the classification of vessels and stationary offshore platforms” (no. 160 dated 09.07.2003, amended on 29.12.2003), the Russian Maritime Registry of Shipping, a Federal State institution, handles the classification of vessels and stationary offshore platforms. The objection is to ensure safe navigation, protect human life at sea, safe transport of freight loads and environmental safety. This classification includes drafting and publication of rules, examination and co-ordination of technical documentation, and certification of manufactured articles, vessel construction and offshore stationary platforms by class.

In the event of failure to comply with the rules above, the technical inspection and vessel classification authorities are entitled to prohibit the operation of vessels, vessel machinery, and other vessel components and to withdraw operation licenses previously issued. A vessel may only operate after it has been established that it will satisfy the requirements regarding safe navigation.

For your information:

Russia has still not ratified the 1990 International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC Convention) drawn up by the International Maritime Organisation.

³⁴ <http://www.flb.ru/info/38564.html>

³⁵ www.barentsobserver.com - “New rules for navigation in the Barents Sea - not including supertankers”, 16/01/2007

³⁶ <http://www.transporthussia.ru/2006-08-10/sea/namore.html>

2.3.3 Safety at sea: the tanker fleet

In December 2003, amendments to Appendix 1 of the MARPOL 73/78 Convention were adopted at the 50th emergency session of the Marine Environment Protection Committee. In essence, these amendments contain new timeframes for taking single-hull vessels out of service, and ban transportation of heavy grades of fuel on these vessels.

Following the accident involving the tanker “Prestige” off the coast of Spain in 2002, the European Union recommended that its Member States prohibit navigation of so-called single-hull tankers in their territorial waters in order to prevent the leakage of oil and petroleum products in the event of an accident.

As of October 22, 2003, ports in EU Member States were closed to single-hull tankers carrying residual fuel oil and heavy grades of oil. A European Commission resolution established that all single-hull tankers more than 23 years old had to be taken out of service by 2005,

Here’s a thought...

"In Russia during the next decade or so, for economic reasons, bigger ships may be used, which may not be of the same modern standard as current, smaller ships," says Bjorn Eric Krosness, chief engineer for the Norwegian Coastal Administration.³⁸

while all remaining single-hull vessels would lose their right to call at ports in EU countries starting from 2010.⁴⁰

As of April 5, 2005, all types of heavy fuel must be

carried exclusively in vessels with double hulls (single-hull vessels may only be authorised on condition that their displacement is less than 5,000 tonnes). Beginning in April 2008, it will no longer be possible to ship heavy types of fuel in single-hull vessels at all. Furthermore, all single-hull tankers more than 15 years old will be required to pass an international inspection. Depending on inspection results, authorities in the member countries of the International Maritime Organisation (including Russia) will have the right to refuse passage for “unreliable tankers” through their territorial waters.⁴¹

The Norwegian Coastal Administration reports that the Russian tankers currently operating along the Norwegian coast have a good standard. On average this tanker fleet is only 3-5 years old. The tankers operating in the internal waters of the Arctic shelf region, however, are much older and of more dubious standard.

For your information:

The 1973 International Convention for the Prevention of Pollution from Ships, amended by the 1978 protocol (MARPOL - 73/78), is the most important agreement concerned with the prevention of pollution at sea ever adopted by the IMO.

Here’s a thought...

“Good cooperation with Russia may be the most important factor contributing to maritime safety in the Barents Sea. This should facilitate attainment of common environmental standards in the Barents Sea. An open dialogue between our countries with extensive exchange of information and knowledge is essential for this cooperation” – Mrs. Helga Pedersen, Minister of Norwegian Ministry of Fisheries and Coastal Affairs.³⁷

Here’s a thought...

To build a vessel with a double hull is usually 30-50% more expensive than to build one with a single hull. An icebreaking cargo vessel is three times as expensive as a normal cargo vessel. Insurance is an important factor when vessels are operating in Arctic waters. Analysts believe that insurance companies will cover the risk inherent in navigation in ice-covered areas. However, how expensive insurance policies will be is an unanswered question. There is still little experience related to this issue.³⁹

Here’s a thought...

“The number of tankers with single hulls has increased markedly. The biggest danger in shipping and storing oil is posed by small and medium-sized Russian oil producers”, says Tatyana Serikh, an oil and gas specialist at the World Wide Fund for Nature (WWF). According to Serikh, oil en route to the main oil port of Murmansk is either transported through temporary moorings and ports on the coast of the White Sea, or via tankers with single hulls, which increases the risk of leaks.⁴²

2.3.4 Safety at sea: Co-operation between oil companies and the military

Gazprom and the Russian navy, the Northern Fleet, signed a memorandum on joint cooperation and action in the Russian north in 2002. Gazprom and the Northern Fleet are supposed to cooperate when executing projects concerned with construction of facilities for converting and transporting oil and gas. Cooperation is also

³⁷ Speech at the Haugesundkonferansen 2006

³⁸ <http://www.inosmi.ru/print/229975.html>

³⁹ www.ocean-futures.no

⁴⁰ <http://www.moles.ee/business/03/Nov/19/04.php>

⁴¹ http://www.neftevedomosti.ru/press.asp?material_id=297&issue_id=49

⁴² <http://www.inosmi.ru/print/229975.html>

proposed for developing a transport infrastructure. According to the agreement, the Northern Fleet will also participate in designing and building infrastructure facilities for the Shtockman gas condensate field, and the plant in Vidjaevo for producing liquefied natural gas, and construction work on the North Europe Gas Pipeline (NEGP). (Fig. 14 The “Admiral Kuznetsov”).

This memorandum also designates: use of the naval auxiliary, shipbuilding and ship repair factories, and navy territory, installations and offshore infrastructures for ensuring that Gazprom carries out its activities; the establishment of an integrated security system for production facilities and the transportation of oil and gas by sea, including provision of an emergency rescue system; and the development of a joint transport provision plan, which includes transport by sea, air and other forms.

Here’s a thought...

“Our vast experience, unique technologies and the technical possibilities open to us increase reliability and safety as regards the construction and operation of marine oil and gas installations”, according to Vladimir Masorin, Commander-in-Chief of the Russian navy.⁴³

Here’s a thought....

“Look at the waters in the Kola Gulf which are inundated with petroleum products around the areas controlled by the Northern Fleet and at Severomorsk following a general clean-up on ships and vessels belonging to the Northern Fleet. In addition, in under a year, the heavy aircraft carrier “Admiral Kuznetsov” is on everyone’s lips as “bitter fuel oil tears” flow from all of its orifices, and not just into our waters, but into those of our neighbours. And if the military was to take some hand or other in oil production, one can only guess what would come of this. I believe that everyone must take care of his own affairs”, declared Andrey Merzenkov, deputy head of the Arctic Specialised Marine Inspectorate within Russia’s Ministry of Natural Resources.⁴⁴

2.4. Future plans for oil and gas transport in Northwest Russia

In accordance with Russia’s Energy Strategy for the Period up to 2020, the following main routes have been specified for developing the oil transport system:⁴⁵

- The North Baltic route - construction of the second stage of the Baltic pipeline system with an increase in capacity of up to 62 million tonnes of oil per annum and the creation of a new pipeline system for exporting oil using the transshipment complex on the Kola Peninsula (up to 120 million tonnes of oil per annum); (Fig. 15 Diagram of the Baltic pipeline system);
- The Caspian-Black Sea-Mediterranean Sea route - development of the oil transit routes of the Caspian Sea countries of the CIS by increasing the throughput of the Atyrau - Samara pipeline up to 25 - 30 million tonnes of oil per annum and the bulk oil sea terminals in Novorossisk and Tuapse up to 59 million tonnes of oil per annum;
- The Central European route - connecting the “Druzhba” and “Adria” pipeline systems with the aim of increasing oil exports from Russia and CIS countries through the oil transshipment terminal in the port of Omishal (Croatia). Amalgamating the pipeline systems of central and eastern Europe into a “single system”; (Fig. 16 Diagram of the “Druzhba” and “Adria” pipelines);
- The East Siberian route - establishment of the Angarsk - Nakhodka oil pipeline system (with a capacity of up to 80 million tonnes per annum) with a branch line running to China (Datsin); (Fig.17 Diagram of the Eastern Siberia - Pacific Ocean pipeline); and
- The Far Eastern route - establishment of a transport infrastructure within the framework of the “Sakhalin-1” and “Sakhalin-2” projects, taking into account the prospects for developing oil and gas resources in the area around the Sakhalin Island (Fig. 18 The “Sakhalin” projects).

This section will discuss prospective projects for transporting oil and gas to Northwest Russia. These projects include the transportation of natural gas from the Shtockman, Bovanenkov and Kharasav fields, oil shipments from the Prirazlom field, the Kharyaga-Indiga oil pipeline and the oil terminal in the port of Indiga, as well as the oil transshipment complex and oil reprocessing plant in the port of Lavna.

Numerous plans have been made regarding transport of oil and gas in Northwest Russia. Some of them are on hold, others, like the Murmansk pipeline, have been abandoned. We cannot describe all the projects here in this paper, but have chosen to focus on projects already at the development stage with concrete future plans.

⁴³ www.bellona.ru

⁴⁴ www.bellona.ru

⁴⁵ Russia’s energy strategy for the period up to 2020. Affirmed by an Order from the Government of the Russian Federation dated 28 August 2003

These are key projects within the framework of expanding the system for transporting oil and gas in Northwest Russia.

2.4.1 Transport of natural gas from the Shtockman field

The Shtockman offshore field is located at a distance of 650 km from the coast of the Kola Peninsula. According to the plans presented by Gazprom, natural gas will be transported from the proposed sub sea production complex to the coast through an underwater gas pipeline which will extend 580 km. The gas will be condensed at a specialised plant located in Vidyaevo or Teriberka, where the construction of a liquefied natural gas reservoir, shipping terminal, port structures and installations for preparing gas for overland transport and systems for servicing the production complex are also planned. (Fig. 19 Location of the natural gas liquefaction plant in Vidyaevo)

Shtockman gas condensate field

Location - Barents Sea (650 km from Murmansk)
Reserves - 3.66 trillion cubic metres
Company - the “Gazprom” state company
Market - USA, Europe
Investment –stage one: \$12 - 14 billion
Special features: Construction includes: Offshore sub sea production complex, gas pipeline Shtokman - Vidyaevo, the natural gas liquefaction plant, the main Vidyaevo-Volokhov pipeline (Fig. 20 Location of the Shtockman gas condensate field)



Fig. The route of the overland Vidyaevo-Volokhov gas pipeline in the Murmansk oblast.⁴⁶

There are plans to transport natural gas from the Shtockman gas condensate field to consumers both by sea and by land. These plans include establishing an overland gas pipeline between Vidyaevo in Murmansk oblast, and Volokhov in Leningrad Oblast. The gas pipeline will be 1335 km long and supply gas to a single main gas pipeline system. In the future, it will fill the North European Gas Pipeline. The Vidyaevo-Volkhov pipeline will pass through the territories of the Murmansk oblast (441 km), the Republic of Karelia (689 km) and the Leningrad oblast (205 km). The proposed gasification of the regions designated above is respectively 4.4 billion cubic metres, 2.42 billion cubic metres and 0.3 billion cubic metres by linking to gas pipeline branches. Construction of compressor stations is envisaged to maintain steady pressure in gas pipeline and ensure gas supply.

The gas pipeline will be laid underground. The route of the pipeline is divided up using linear valves into sections of no more than 30 km. The depth of the pipeline’s foundation underground is 0.6 - 1 m. The laying of the gas pipeline through water barriers is envisaged using the trench method, i.e. excavating the trench (ditch) at right angles to the bed of each river, laying the pipe and filling in the trench⁴⁷.

Here’s a thought...

“The Shtockman deposit is situated in a geological area in danger of earthquakes. Atlantic earthquakes in this region occur approximately every 20 years. This can cause severe damage to installations and pipelines, not to mention the environmental consequences such an accident might produce” – *anonymous Russian researcher from the Ecology and Resource Institute in St. Petersburg in an interview in International Politics.*⁴⁸

Thawing permafrost and landslides will pose great challenges to the construction of the Vidyaevo-Volkhov

⁴⁶ www.barentsobserver.com

⁴⁷ *Opening of the Shtockman Gas Condensate Field Volume 13. Materials of the preliminary evaluation of environmental consequences. Part 4. Gas pipeline transport. Murmansk oblast. Book 2. Evaluation of environmental consequences. 2006.*

⁴⁸ *Russian researcher from the Ecology and Resource Institute in St. Petersburg in an interview in International Politics nr. 1-2007*

In the event of an accident on a particular section of the gas pipeline, this section will be closed off from the rest of the pipe by linear valves, after which the gas can be blown off into the atmosphere through blow-off pipes located at the various ends of the discharged section. The discharged gas may also ignite. The sanitary protection zone in relation to the gas pipeline is 350 m and 700 m in relation to the compressor stations.⁴⁹

pipeline. Due to climate change, permafrost is expected to thaw in the area, and make the ground unstable. This will increase the risk of leaks and create environmental consequences.

According to the current plans the liquefied gas will also be transported by sea. From LNG plant, the natural gas will be transported by gas carrier (with displacements of up to 153,000 m³ and lengths in excess of 200 m) to the USA and European States, with Europe given priority. To transport the liquefied natural gas by sea, 38 gas carriers with tank volumes of 153,500 m³ and 215,000 m³ are proposed.⁵⁰

Here's a thought...

Bellona's position with regard to the Vidyaevo-Volkhov gas pipeline construction project:⁵¹

- Information and public access to construction facilities that ensure public inspection are imperative during construction and operation of the gas pipeline.
- Bridge pipeline transitions must be organised across rivers in Murmansk oblast to minimise the disruption of the ecosystem basins and the irreparable damage to fish stocks which can result from the trench method used in the construction of gas pipeline transitions over large and small rivers.
- Consideration must be given to the proximity of the gas pipeline to hazardous commercial installations (such as the Kola Nuclear Power Plant and mining enterprises), the environmental risks must be calculated and the route of the gas pipeline changed if necessary.
- Data evaluating the impact of the gas pipeline on the environment must include a section devoted to closing down the pipeline
- A municipal entity should work out a programme for utilising incoming natural gas for the needs of the population and make provision for the compulsory fuel-switching of boiler rooms and central heating and power plants to natural gas. This will reduce the region's dependence on imported fuel and nuclear power. In particular, it will make it possible to abandon plans for construction of a second nuclear power plant and continued extensions on the period of utilisation of the first nuclear power plant.
- The gas should be cleansed in order to reduce CO₂ emissions.

2.4.2 Transport of oil from the Prirazlomnoye field

The transportation from the Prirazlomnoye field includes the following infrastructure facilities: an offshore ice-resistant stationary platform (the Federal State unitary enterprise "Sevmashpredpriyatie"), transport and technology facilities for ensuring operation in

Murmansk, Severodvinsk and Varandey.



Fig. The shipment of oil from the Prirazlomnoye field in the Pechora Sea.⁵²

Prirazlomnoye oil field

Location - Pechora Sea

Start of transportation - 2008

Capacity - 6.5 million tonnes per annum

Company - The "Sevmorneftegaz" private company (development license)

Special features: There is a proposal to inject the waste from drilling into a specially bored absorption well.

The following transport plan is proposed: oil extracted from the site will be collected in platform oil storage tanks (volume - 110,000 m³), before being transported to the coastal transshipment complex ("Belokamenka") in the Kola Gulf using ice-strengthened shuttle tankers (dead weights of 70,000 tonnes). There are also plans to ship the oil and petroleum products for export by line tankers with dead weights between 120,000 and 170,000 tonnes.⁵³

⁴⁹ Opening of the Shtockman Gas Condensate Field Volume 13. Materials of the preliminary evaluation of environmental consequences. Part 4. Gas pipeline transport. Murmansk oblast. Book 2. Evaluation of environmental consequences. 2006.

⁵⁰ "GAZPROM": DECLARATION OF INTENT, the "Moskovskiy Komsomolets-Zapolyar'e" newspaper, issue number 27 dated 5 July 2006

⁵¹ www.bellona.ru

⁵² www.b-port.com

⁵³ "Sevmorneftegaz is mastering the Arctic", Shchipov B. - "Russia's oil" - "Developing the Russian shelf"

2.4.3 The Kharyaga-Indiga oil pipeline and the oil terminal in the port of Indiga

The Kharyaga-Indiga oil pipeline provides transport of oil extracted from fields in the Timan-Pechora oil and gas-bearing province to countries in the West through the Baltic pipeline system.⁵⁴

This pipeline, which is about 400 km long, traverses the Nenetsky Autonomous District from the south-east in a north-westerly direction. Oil will be heated up at the intermediate and end points during transport to the offshore terminal. This terminal is comprised of the bulk plant, underwater oil pipelines, offshore structures and a portable mooring structure allowing tankers with dead weights of up to 150,000 tonnes to be serviced. Oil received at the terminal by pipeline is transported further by tanker to consumers in the USA and Europe via the offshore transshipment complex.⁵⁵

The oil pipeline route winds through permafrost and swamp areas. It traverses 14 rivers including the largest arterial waterway in northern Europe - the Pechora River. Depending on geological conditions and relief characteristics, the pipeline will be laid both underground and above ground.

In the area of the Indiga settlement, the construction of an oil terminal and reservoir park with a total capacity of 562,000 m³ is proposed. At present, two other options exists for locating the terminal: Cape Bolshoy Rumyanichniy and Cape Svyatoy Nos.⁵⁶



Fig. Route of the Kharyaga-Indiga oil pipeline.⁵⁷

Kharyaga-Indiga oil pipeline

Start of construction - 2008
 Region - Nenetsky Autonomous District
 Company - "Transneft"
 Raw materials base - Timan-Pechora province
 Length - 450 km
 Yield - 12 million tonnes per annum
 Main markets - Europe, USA

Here's a thought...

Permafrost is soil with a temperature of or below 0 degrees for two or more years. The extent of permafrost varies as the climate changes. Construction on permafrost is complicated due to the melting and subsequent sinking of permafrost caused by the heat irradiated from buildings and pipelines. The Trans-Alaska Pipeline System in the United States uses insulated heat pipes to keep the pipeline from sinking into the permafrost.

The indigenous people in this area protest against the second option, because of ancient coastal region sanctuaries located here. "Transneft", in turn, is trying to vindicate the Svyatoy Nos option, referring to more favourable factors such as better harbour condition and the absence of fish spawning grounds. Furthermore, the Svyatoy Nos option makes crossing the Indiga River unnecessary and reduces the length of the route, thereby significantly lowering the project's cost.⁵⁸

Oil transshipment complex in the port of Lavna (first stage)

Commissioning - 2008
 Region - Murmansk oblast
 Company - the Sintez corporation (a private company)
 Capacity - 10-12 million tonnes per annum

⁵⁴ "In the wild north ... the need for the Kharyaga-Indiga oil pipeline only came about with the development of the undistributed Timan-Pechora subsoil fund" - OIL AND CAPITAL No. 6/2006

⁵⁵ "In the wild north ... the need for the Kharyaga-Indiga oil pipeline only came about with the development of the undistributed Timan-Pechora subsoil fund" - OIL AND CAPITAL No. 6/2006

⁵⁶ "In the wild north ... the need for the Kharyaga-Indiga oil pipeline only came about with the development of the undistributed Timan-Pechora subsoil fund" - OIL AND CAPITAL No. 6/2006

⁵⁷ "In the wild north ... the need for the Kharyaga-Indiga oil pipeline only came about with the development of the undistributed Timan-Pechora subsoil fund" - OIL AND CAPITAL No. 6/2006

⁵⁸ "In the wild north ... the need for the Kharyaga-Indiga oil pipeline only came about with the development of the undistributed Timan-Pechora subsoil fund" - OIL AND CAPITAL No. 6/2006

2.4.4. The oil transshipment complex and oil reprocessing plant in the port of Lavna

Construction of transshipment complex in the port of Lavna is planned within the framework of developing the Murmansk transport terminal (Fig. 21 Lavna). The territory of Lavna's integrated production base and the area of the transshipment base in Prichalniy will accommodate the platform supply base for the Medynsko-Varandey licensed area when it is developed (the "Arcticshelfneftegaz" private company).⁵⁹

Construction of an oil reprocessing plant is also planned at the mouth of the Lavna River in the Murmansk oblast, on the west coast of the Kola Gulf. The Moscow-based company "Sintez" participates in the project. Its subsidiary, "Arcticshelfneftegaz", owns the license to produce oil. However, the oil located on the shelf of the Pechora Sea, where reserves are estimated at 100-200 million tonnes, has a complex structure and the company is of the opinion that it would not be viable to export it in its raw form. Therefore, there is an orientation towards oil reprocessing.⁶⁰

Oil reprocessing plant in the port of Lavna (first stage)

Region - Murmansk oblast

Company - the Sintez corporation (a private company)

Raw materials base - oil on the shelf of the Pechora Sea

Capacity - 6 million tonnes per annum

Total investment - 24 billion roubles

Special features - the planned end products are directly distilled benzene, benzene of brands AI-92 and AI-95, diesel fuel, residual fuel oil and liquefied gas.

Directly distilled benzene and residual fuel oil will be exported, while the remainder is destined for the Russian market.

will occur through the Bay of Obsk to the Yamburg compressor station within the "Yamburg-Centre" main gas pipeline. In the future, gas from the Kruzenshtern field will also be transported via this route. Apart from gas in the fields already mentioned, oil and gas from fields in the Tambey group will be pumped along the second Bovanenkov-Baidaratsk branch line. Other options for transporting gas are also being examined by Gazprom.

In addition, pipelines from the Bovanenkov and Kharasav fields will be laid to join Borkuta-Ukhta-Mikun. To transport stable condensate amounting to 1.88 million tonnes per annum, a provision is made for laying a pipeline from Bovanenkov gas condensate field to the underground Kharasav gas condensate field reservoir, and for the possibility of shipping it to consumers by rail as well as by sea.⁶¹

2.4.6 Oil complex in the Pechenga Bay in the Murmansk oblast



Fig. Pechenga Bay in Murmansk oblast
Timan-Pechora province will also serve as a raw materials base.

The "Severnaya Neft" company is planning to build the "Northern Sea Port" oil complex and dry cargo port in Pechenga Bay. There are two potential areas where construction could take place – around Trifonov and north-west Linokhamar (see to the site plan diagram).

The intention is to transport oil from the Timan-Pechora province, through the terminal in Pechenga, and from the Arctic shelf fields in the future. The transport will utilise low dead weight sea tankers that reload in port on to larger tankers and export to the North American market.

Furthermore, there is also a proposal to transport oil and petroleum products in railway tank cars for short-term storage and loading on to ships. In this instance, the oil and gas fields in the

For your information:

Oil complex and dry cargo port
"Northern Sea Port"⁶²

Region - Murmansk oblast

Start of initial petroleum product transshipments - 2009

Operating at full capacity - 2015

Cost - USD 2 billion

Company - The "SEVNEFT" limited liability oil company

Capacity:

⁵⁹ www.murman.ru

⁶⁰ www.b-port.com

⁶¹ <http://www.infoil.ru/news/print/4278>

The oil and petroleum product reprocessing capability of the terminal is calculated at 30 million tonnes of oil and petroleum products per annum. The terminal is also able to receive 120 railway tank cars and up to 4 tankers with dead weights of 150,000 tonnes and above simultaneously.

oil terminal - 30 million tonnes per annum
 bulk cargo terminal - 25 million tonnes per annum (coal, ore)
 general container load terminal - 7 million tonnes per annum
 terminal for reloading timber and other loads - 3 million tonnes per annum
Particular feature: proximity to the Ainov Islands (Kandalaksha State Nature Reserve).

The “Northern Sea Port” oil complex and dry cargo port is situated not far from water-conservation areas of the Barents Sea, regulated under a special management regime which entirely forbids emissions to the coastal waters.

Table 3. Possible emergency situations: type, probability and scale, as presented by Gazprom ⁶³

No.	Operations	Possible events	Anticipated frequency	Quantity of spilt petroleum products
1	Petroleum product shipment	Rupture in the moorings, resulting in the hose overloading	Once every 5 years	20 ± 3 litres (with the pumps switched off), 0.1 tonnes (with the pumps switched on)
		Failure of the hose seals	Once every 2 years	10 litres
		Hose rupture	Once every 100 years	1-2 tonnes
		Pipeline leak	Once every 1000 years	500 - 1000 tonnes
2	Mooring and attaching to/disengaging from a Single Mooring Point	Interference with the floating hoses	Once every 20 years	7 tonnes
3	Tanker arrival	Collision with a vessel	Once every 20 years	0

Here’s a thought...

Although there are no exact statistics on pipeline ruptures (since oil producing companies intentionally understate data on number of accidents), according to expert evaluation, 50-60 thousand pipeline ruptures there occurred annually in Russia from 2000-2004, including approximately 300 accidents with emissions over 10,000 tons of oil.⁶⁴

⁶² Declaration regarding the intention to build the “Northern Sea Port” oil complex and dry cargo port in Pechenga Bay in Murmansk oblast

⁶³ Technical description of the “Northern” port investment project

⁶⁴ Yablokov, A.V. *Russia: Health of Nature and People*. - Moscow, 2007.

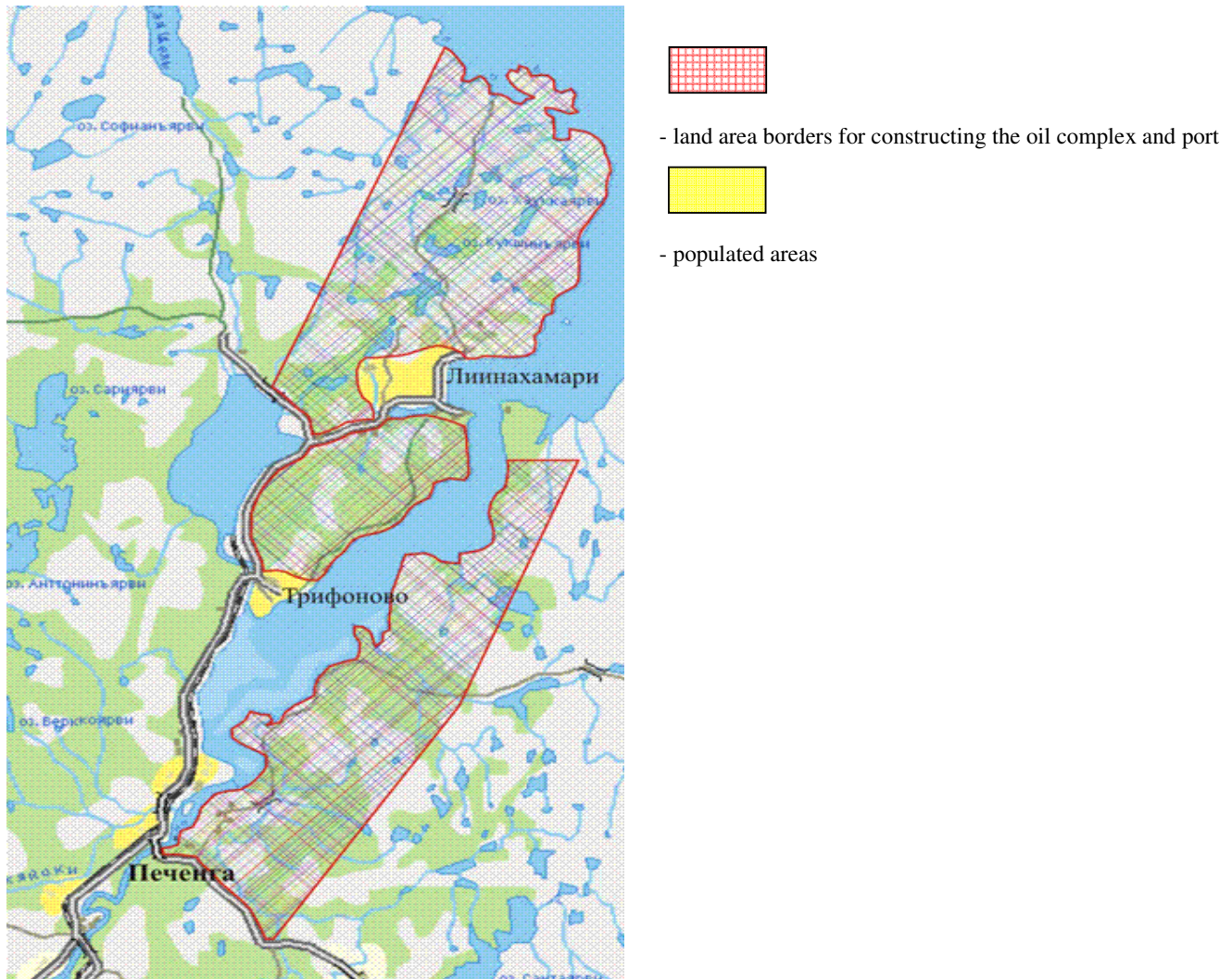


Fig. Site plan relating to the Declaration regarding the intention to build the “Northern Sea Port” oil complex and dry cargo port in Pechenga Bay in Murmansk oblast

Conclusions

1. Surveyed oil and gas reserves in Northwest Russia do not indicate a significant and prolonged increase in the level of production in the long run and, accordingly, do not substantiate the need to establish surplus export capacities.
2. The current system for transporting oil and gas in Northwest Russia is largely based on the transshipment of oil from fields in the Timan-Pechora province, primarily using tankers of various dead weights and offshore and coastal terminals. Regional operating companies specialising in transporting loads by sea, including bulk oil loads, primarily use tankers for shipping. Supplies of oil transported by tanker are directed for export to Europe and the USA.
3. In addition, significant volumes of oil from fields in the Timan-Pechora province are transported by a system of pipelines belonging to the State company “Transneft”. Existing pipelines in Northwest Russia are located a sufficient distance from marine ports such as Murmansk, Arkhangelsk and Vitino and, consequently, oil and petroleum products are transported from there by rail in tank wagons. Oil is also bound for export to Europe and the USA.
4. A network of offshore and coastal terminals for executing oil transshipment operations has been developed in Northwest Russia. At present, there are 11 terminals and 9 of them are in exploitation. They include offshore transshipment complexes such as the “Belokamenka” tanker holding lagoon and coastal terminals in the ports of Murmansk, Arkhangelsk, Vitino and others. In the event of an oil spill, each terminal either has

its own service for clearing up the aftermath, or has entered into an agreement with the Murmansk basin emergency rescue service.

5. At present, there are no clearly defined routes for tankers carrying bulk oil loads. The designation of detailed routes at sufficient distances from the coastline would reduce the probability of shipping accidents as the amount of traffic in the Arctic shelf seas continually increases, and most importantly, would minimise the damage to the environment in the event of an oil spill. Clearly defined routes would also make it easier to monitor ship traffic.
6. In Northwest Russia, development of the system for transporting energy carriers has followed two main trends: the transport of oil and gas by sea - an increase in the volumes of oil carried by sea tanker, the construction of new terminals and an increase in the capacity of existing ones; and the transport of oil by pipeline - the construction of new sea and land-based pipelines. These projects are already at the development stage and their execution is planned in the near future.
7. An increase in the volume of oil and gas transported in Northwest Russia requires the improvement of measures aimed at preventing and eliminating oil spills, as well as the establishment of an effective ecological monitoring system. Increased oil and gas activity increases the risk of accidents and the vulnerable environmental conditions of the north has to be taken into account.