deugro

Tobolsk Project

Petrochemical

Case Study: Tobolsk Project

In direct cooperation, deugro Hanau and deugro Moscow executed deliveries of equipment for two major engineering, procurement and construction companies (EPCs) from Germany and France during the 2016, 2017 and 2018 shipping periods. The equipment was shipped to the biggest integrated complex for the production of polymers in Russia, located in Tobolsk.

This petrochemical complex is Russia's first world-scale manufacturing facility. It includes a steam cracker for the production of ethylene, propylene and butane-butylene fraction (BBF), as well as polyethylene units and a polypropylene unit. The products manufactured are designated for the textile and packaging industries and will also go towards the production of car body parts and consumer goods.

This case study describes how deugro provided top-class logistical solutions for both EPCs to deliver all the cargo on time and within budget.

Remote location of Tobolsk, Russia

Tobolsk is a town in Tyumen Oblast, Russia, located at the confluence of the Tobol and Irtysh Rivers, one of the most remote areas in Russia. It is a large industrial center in the field of gas chemistry, located in Western Siberia. The temperatures in winter fall to as low as minus 40 degrees Celsius and, when combined with icy winds, make working conditions extreme for all involved. In summer, the soil turns wet, which creates obstacles for any work on the ground.

Due to the intense weather conditions, deliveries are very difficult to perform. Heavy plant equipment can only be delivered via the Tobolsk waterways within a short navigational period of approximately 45 days between July and August. A delay of just a few days could result in the delivery being postponed to the next summer. To counteract the weather conditions, deliveries have to be meticulously planned, considering the construction schedule, delivery sequences, cargo readiness, opening of the navigational periods and, of course, the mobilization of the equipment such as barges and tugs.

Cargo Highlight
Two splitter units weighing 920 MT each, 106 m long

Total Volume
261,000 FRT shipped for two contracts

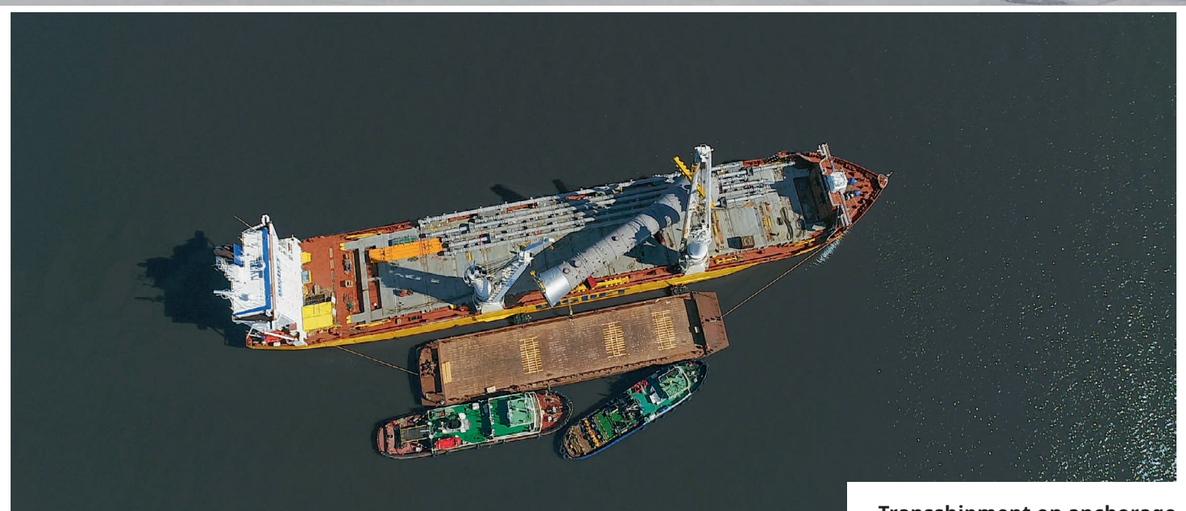
Complex Transshipment Operations
On anchorage

Full Charter
~30,000 FRT carried in one single voyage

Tight Schedule
Matching short navigational time frames

Remote Ports Involved
Without landside infrastructure

Experience the complete transportation and watch the project videos on YouTube: deugro group – Tobolsk



Transshipment on anchorage onto barge at Novy Port

Project execution

deugro was awarded two contracts from major EPCs for delivering equipment to the massive petrochemical complex in Tobolsk, Russia. Both scopes were successfully executed by the centralized project control tower in Hanau (near Frankfurt), Germany alongside deugro Moscow (onshore coordination office) for all local Russian coordination.

Transshipment of C3 splitter onto barges in the remote area of Kirkenes, Norway

Water wash column lifted in Ulsan New Port, South Korea

Project Data
Ethylene Cracker Plant

- Client: German EPC
- Cargo: Heavy lift and oversized equipment
- Cargo highlight: 2 C3 splitter units (106 x 8.5 x 9 m / 920 MT each)
- Navigational period: 2016 to 2017
- Total volume: 131,000 FRT

Ethylene cracker plant

Because of the short navigational time frame, the scope was divided into two movements of approximately 63,000 FRT in 2016 and 68,000 FRT in 2017. The scope included only heavy and oversized cargo that could not be transported by road, including extremely heavy items with lengths of up to 106 meters and weights of up to 920 metric tons per unit.

First phase in 2016
The cargo was delivered to Tobolsk with six full-charter ocean vessels from various loading ports in the Far East and Europe to the Port of Sabetta. This port is located far away from the normal shipping routes in the North Arctic of Russia. After arriving at Sabetta, all cargo was directly discharged onto waiting barges. These barges had been purposely mobilized from the Russian hinterland and Europe to receive the equipment for onwards transportation via the Ob/Irtysh River system to the purpose-built jetty at the Tobolsk job site.

A total of 11 barge voyages were necessary to deliver all the material on the approximately 1,500 kilometer river voyage. Each transport took about 10 to 14 days.

Only one vessel was not discharged at Sabetta, but instead deugro chose the remote Port of Kirkenes in Norway for the transshipment onto barges. These four barges (with a unit weight of 1,250 metric tons each) were mobilized from Rotterdam by a self-geared heavy lift vessel with open hatch sailing.

Second phase in 2017
Within the second navigational period, deugro delivered another 68,000 FRT to Tobolsk, this time with seven full-charter vessels from various loading ports in the Far East and Europe. As the previous transshipment operations at Sabetta had proven to work well, it was decided to transship all items to the Port of Sabetta again.

To allow the highest flexibility in terms of delivery sequence due to changes in construction, it was mutually decided with the client to set up a customs bonded area at the Port of Antwerp. All materials from the various loading ports in the Far East were shipped prior to the navigational period into Antwerp for consolidation. This allowed our client to pick and choose on short notice the items required on the site, since the transit time from Antwerp to Sabetta is only about seven days.

Highlights
The first shipment already marked a highlight: A full charter of MV *Happy Sky* carrying approximately 30,000 FRT in one single voyage. The reason for choosing this sophisticated, state-of-the-art heavy lift vessel, which is equipped with two x 900 SWL cranes, was due the weight and complexity of the cargo originating from Ulsan, South Korea.

During 2017, a record number of 25 barge trips were shuttling on the Ob/Irtysh River between Sabetta and the Tobolsk jetty. Although the freight volume for 2017 was similar to the volume shipped in 2016, the quantity of items nearly doubled. In addition, the cargo was sourced from more vendors and loading ports.

Discharge of overdimensional cargo on anchorage at Novy Port

Polyethylene processing plant

This contract included not only heavy lift and oversized cargo, but also general cargo, full container loads, trucking and multimodal movements from origins around the world to the Tobolsk job site in Russia. Among the most difficult tasks for the project team at deugro Hanau was the dispatch of more than 1,500 truckloads from free carrier (FCA) vendor premises all over Europe and Asia to the final job site.

Parallel to the ongoing general cargo shipments shipped by rail and truck, the navigational period in summer 2017 was also used to deliver the heavy and oversized plant equipment via the Northern Sea Route. To avoid the congestion at the Port of Sabetta, it was decided to conduct the transshipment operation (on anchorage) in the arctic area of Novy Port.

In total, deugro chartered three ocean-going vessels for this scope, with all of these discharged at Novy Port onto a total of 13 barges for the onward journey via the Ob/ Irtysh River system to the Tobolsk jetty.

Highlight
The remote Novy Port is located approximately 300 nautical miles south of Sabetta within the Gulf of Ob and does not have any landside infrastructure. All cargo needed to be discharged on anchorage while facing the harsh local weather and hostile environment.

Reactor alongside Ortona Port, Italy

Project Data
Polyethylene Processing Plant

- Client: French EPC
- Cargo: All equipment relating to a polyethylene plant
- Cargo highlight: 2 polymerization reactors, 340 MT each
- Navigational period: 2017, with general cargo shipped in 2016, 2017 and 2018
- Total volume: 130,000 FRT over all transportation modes

Side Story: Northern Sea Route (NSR)

The Northern Sea Route (NSR), also known as the Northeast Passage, is a trade route through the Arctic connecting the Atlantic and Pacific Oceans. This arctic shipping lane offers various advantages over the traditional routing via the Suez Canal. Vessels plying this route can benefit from faster transit as well as less fuel consumption and CO2 emissions, and they can avoid the High Risk Areas (HRAs) of the Coast of Somalia and the Gulf of Aden.

The NSR played an important role in the successful execution of the Tobolsk Project. Some of the long-lead items sourced in Asia were urgently required at the site due to the client's ambitious construction schedule. A timely arrival could only be achieved by sailing through the NSR—cutting the vessel's journey by almost 7,000 nautical miles and around 25 days.

deugro only considered suitable ice-classed vessels to carry the critical components for the ethylene cracker and the polyethylene processing plants from the various loading ports in the Far East to the discharge Port of Sabetta and Novy Port, located off the Siberian Coast in Russia, via the NSR.

Sailing the NSR requires special know-how and experience with local authorities and permission from the Northern Sea Route Administration (NSRA) in advance. Detailed planning and on-time scheduling is of utmost importance, since vessels usually sail the NSR in a convoy accompanied by ice-breaking vessels. After passing the Bering Strait and sailing through the Chukchi Sea, the vessels wait at the Port of Pevek, located in the East Siberian Sea, for the assisting ice-breaking vessels and other merchant vessels to arrive in order to jointly proceed as a convoy through the NSR.

Over 30 vessels chartered by deugro successfully sailed through the NSR between 2015 and 2017 for the various projects handled by deugro in the Arctic Region.

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