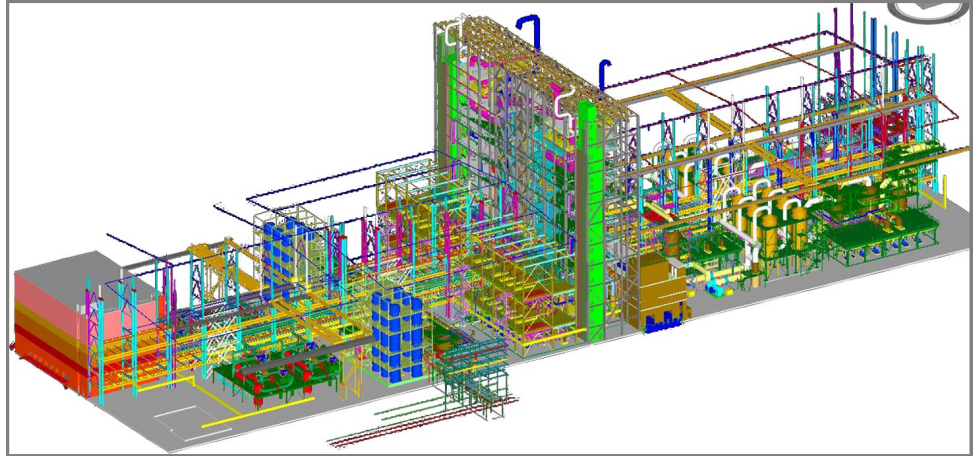


Clean Air for Siberia

ENERGY & ENVIRONMENT: *Pörner Group plans desulphurization plant for the nickel production of MMC Norilsk Nickel in Russia north of the Arctic Circle*

Pörner Ingenieurgesellschaft mbH managed the planning of a desulfurization plant for the nickel production of Norilsk Nickel in Russia. In December 2015, the project received approval from the authorities.

Norilsk Nickel operates a non-ferrous metal plant for the production of nickel from locally obtained ores near Norilsk / Siberia. The site will get a new production downstream exhaust desulfurization plant, which uses 95% or more of sulfur dioxide emissions, thereby producing 600,000 tons of sulfur per year. In doing this, the plant contributes largely to solving the environmental problem of the industrial region around Norilsk and contributes significantly to the environmental protection of the entire Arctic Circle.



3D view of the desulfurization plant consisting of 25 units

International project management

The engineering tasks of Pörner Group, that lasted more than three years, consisted of the overall coordination and management of the entire service package.

"Our service package involved the overall coordination as well as the FEED design, authority engineering under Russian law, including preparation of the necessary detailed plans, actual inventories, extensive geological, topographic and environmental investigations on site, a detailed Environmental Impact Assessment (EIA) with public participation, creating the dismantling plans for existing plants, planning of the new facilities within the site, as well as tendering for the techno-

logical equipment, and scheduling.

The project scope also included all necessary auxiliary systems (cooling towers, fire extinguishing system, water treatment, wastewater treatment, instrument air, nitrogen and electrical power generation plants) and the corresponding integrations into existing networks. Overall, the plant comprises of 25." explains project manager and managing director of the German Pörner branch in Grimma, Ing. Gerhard Bacher.

For the execution of this major project, an international project team has been formed under the leadership of Pörner Grimma, which consisted specialists of the Pörner subsidiaries in Vienna, Grimma,

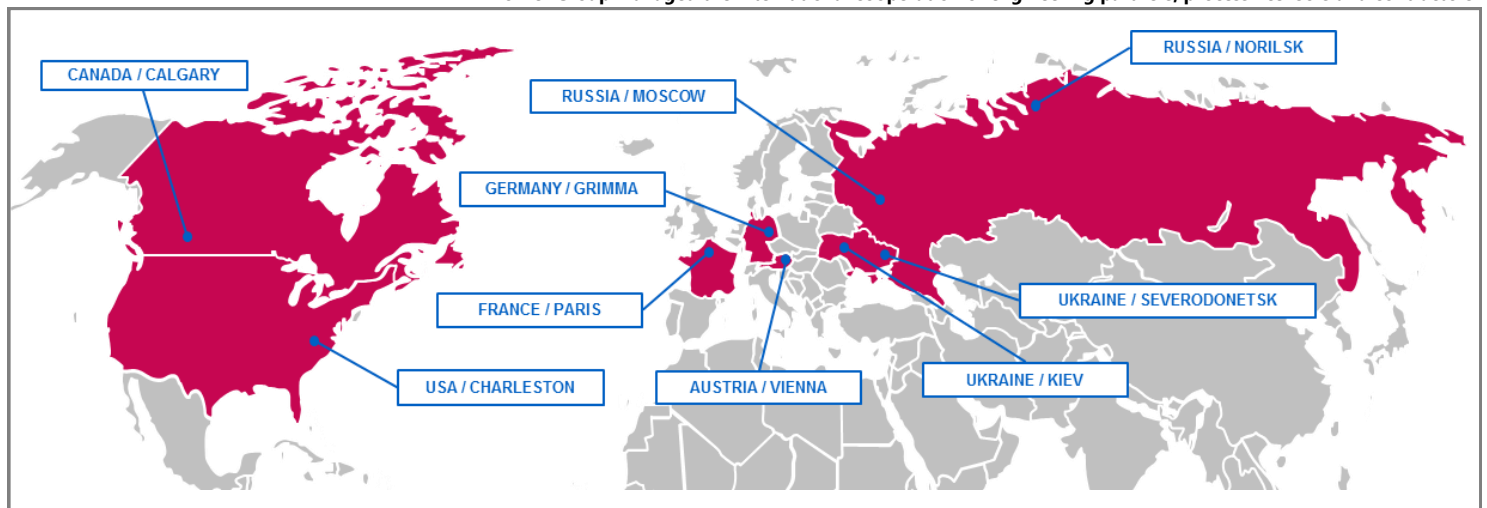
Kiev, Severodonetsk and Moscow.

A number of international partners took part in the project, including Russian partners for the implementation of local recordings, surveys, special planning and detail planning (authority permit applications according to Russian laws are already partially complete), which needed to be coordinated and led.

Project history: Medvedev and Monti focus, with Norilsk Nickel, on environmental protection

The efforts of the Norilsk Nickel company have been strongly supported, since the project started in 2011, by the Russian government and the local authorities. At

Pörner Group managed the international cooperation of engineering partners, process licensors and contractors





View of the industrial area of the Norilsk Nickel Mine

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that time, an international tender was launched with the aim to modernize the plants in Norilsk, for example, the introduction of European standards for strengthening of environmental protection.

Pörner Group has been involved with the general contractor Techint (Milan / Italy) as well as technology partners from Belgium and France for this project. At the end of a many month-long selection process in which a total of 27 international companies participated, the team made up of Pörner, Techint, DuPont and MECS Le Gaz Integral, came out on top. The total contract value (turnkey) for the, then advertised, two plant complexes- comprising of an exhaust gas purification plant for the nickel and the copper factory - amounted to a single-digit billion dollar amount.

The contract was signed in Moscow with the main contractor Techint and took place in the presence of Russian Prime Minister Dmitry Medvedev and the Italian Prime Minister Mario Monti. In the first phase, the consortium was commis-

sioned with the FEED-planning and the entire authority application.

Pörner takes over the planning

In 2014, Techint withdrew from Russia for business reasons. Thereafter, in summer of 2014, Norilsk Nickel entrusted the Pörner Group with the continuation of the FEED design and the authority engineering for the nickel plant.

The dimensions of the project and the efforts that have been made to cope with the tasks are exceptional: never before has such a highly technical mega-project under such difficult conditions been planned, with almost continuous permafrost, an average temperature of -10.2°C , minimum temperatures of -57°C , permafrost and transportation that is only possible via sea or flow path.

Peter Schlossnikel, managing partner of the Pörner Group, said: *"In close cooperation with the technology providers and local partners, we could ensure that all necessary documents were handed over*

on time to Norilsk Nickel for the preliminary test, in August 2015.

After the successful completion of this preliminary assessment was carried out in late September 2015, the official submission to the authorities could be done. We are extremely pleased that there was a positive approval by the authorities only two months later. Thus, a very important milestone had been successfully completed."

The plant concept

In the plant, the most modern technology is used, which provides for the pre-cleaning and concentration of sulfur-containing gases. In the downstream catalytic conversion, the gases are concentrated using the Claus principle to liquid, elemental and granulated sulfur, thus allowing for the transport and storage of the sulfur.

This technology chain won the customer over.



23. July 2012: Norilsk Nickel and Techint sign the Memorandum of Understanding in Moscow - in the presence of the Prime Minister of Russia, Dmitry Medvedev, and Prime Minister of Italy, Mario Monti



NORILSK NICKEL

MMC Norilsk Nickel

The Russian metal giant MMC Norilsk Nickel is the world's largest producer of nickel and palladium. The company ranks among the world's four largest producers of platinum and is in the top 10 largest copper producers

The company manages to claim 1.5% of Russia's gross domestic product. The operational business of MMC Norilsk Nickel is mainly in the Krasnoyarsk region in northern Russia, some 300 km north of the Arctic Circle, where the company is by far the largest employer.