



GARO AM2500

Case Study

## GARO Delivers Efficiency Boost for Chlorine User

When one of the world's leading metals and mining companies seek to upgrade a key asset, they turn to GARO, the experts in supplying reliable, resource efficient solutions for low-pressure, wet chlorine applications.

Nornickel is one of the world's largest nickel and palladium producers. The company's core operations is focused on prospecting, exploration, mining, concentration, and processing of minerals, as well as the production of non-ferrous and precious metals. Nornickel's products are supplied globally to over 30 countries.

### Overview

#### CLIENT

Nornickel

#### LOCATION

Kola Peninsula, Kola MMC  
Russia

#### APPLICATION

Low Pressure, Wet Chlorine for  
Nickel Production

#### PRODUCTS

■ 3 GARO C 80 2.5 Ti Liquid Ring

Compressors

■ 7 GARO AM 2500 Ti Liquid Ring  
Compressors

#### CUSTOMER BENEFITS

- 50% Increase in Productivity
- 30% Decrease of Annual Maintenance Costs
- Reduction in Downtime



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Located on the Kola Peninsula, Kola MMC is one of Nornickel's largest assets and the leading industrial facility in the Murmansk region. With over 12,000 employees working on-site, Kola MMC contains a resource base of 1.1mt of copper, 2.3mt of nickel, and over 340mt of ore spread across five ore fields (Pechenga, Sputnik, Bystrinskoye, Tundrovoye, and Verkhneye). In addition to mining assets, Kola MMC plays home to smelting facilities in Zapolyarny, as well as refining and nickel electrolysis facilities located in Monchegorsk, with the goal of increasing production efficiency on the rated 120,000 tonne/year nickel plate output.

Key to the success of the project was an overhaul of the nickel production process, whereby nickel was produced by via electrolysis. To achieve this, the facility's existing equipment needed to be replaced with a stable of rotating, low pressure, wet chlorine systems. To carry out the upgrade, Nornickel contracted UK based ERG (Air Pollution Control), Ltd., an engineering services company, to provide three packages of equipment to enable the facility's anolyte degassing, chlorine cooling and compression, and emergency chlorine scrubbing processes.



## The Solution

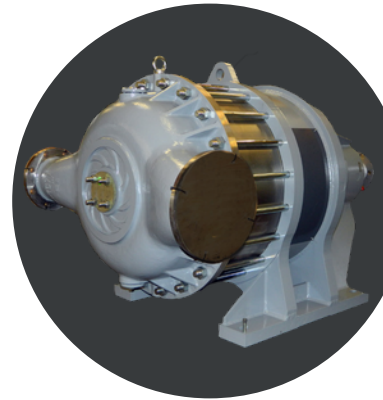
Aware of GARO's reputation for supplying reliable, resource efficient solutions for low-pressure (< 5 bar), wet chlorine applications, ERG felt that Garo's products would be an ideal fit for the planned upgrade project. Split across two projects, 'Cobalt' and 'Nickel Expansion', the team at ERG set out to design and deliver a set of systems built around GARO compressors that would offer stable and reliable performance while meeting Nornickel's requirements.



Designed, manufactured, tested, and delivered in 2012 the 'Cobalt' system consisted of three GARO C 80 2.5 Ti liquid ring compressors. The package was commissioned in 2014 during a planned maintenance shutdown.

The 'Nickel Expansion' project system consisted of 7 GARO AM 2500 Ti liquid ring compressors, with six units having been delivered in 2014, and the remaining unit in 2017. To comply with state GOST Standards, Nornickel opted to commission the Nickel Expansion project with the last supplied compressor available on-site, maintaining the seven GARO units provided with hot and cold spares.

Each compressor delivered was fully built out of titanium to minimize the risk of corrosion, and utilized GARO's innovative cone design to maximize efficiency by eliminating metal-on-metal contact, and reducing the clearance between static and rotating parts. In addition to the compressors units, each supplied package was delivered with an automated logic controller to help meet the customer's 0 - 100% operational turndown requirements, as well as custom optimized pipe routing to simplify installation and maintenance.



## The Result

The end result for Nornickel was clear, with the upgrades expected to drive a 50% improvement in production efficiency over the existing system at the Monchegorsk facility. In addition to the boost in productivity, Nornickel also expects an estimated 30% reduction in maintenance costs, as well as a reduction in downtime.

Having successfully delivered over 50 single stage compressors for low pressure, wet chlorine applications, GARO has cemented its reputation as a provider of innovative, reliable, high-quality solutions.

To find out more about Garo Compressors for Chlorine visit

[www.garocompressors.com](http://www.garocompressors.com)




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