

Results in key R&D areas in 2017

Company Development Strategy

- feasibility study to choose the optimal design for the Company's copper refining facilities (stage 2);
- operating procedures for a feasibility study on refining non-ferrous and precious metals.

Production

Mining:

- adjusted design documents at the mines;
- feasibility study on building an underground crushing section at Skalistaya mine;
- audit of mechanical earth models of Polar Division mines (stage 1);
- feasibility study on using tailings for backfilling on Talnakh mines and on providing Polar Division with limestone and cement.

Concentration:

- project on producing high-grade and low-grade concentrate at Kola MMC's concentrator and organising shipments of the high-grade concentrate to be accepted and processed at Nadezhda Metallurgical Plant of the Company's Polar Division;
- adjusted operating procedures for ore enrichment at the Bystrinskoye Field;
- adjusted operating procedures for simultaneous processing of disseminated and cuprous ore mixture at Stage 3 of the Talnakh Concentrator.

Smelting:

- adjusted operating procedures to design nickel production facilities at Kola MMC based on the chlorine leaching technology, which will improve the tank-house-2 capacity to 145 ktpa of cathode nickel;
- adjusted operating procedures to design continuous converting facilities at Nadezhda Metallurgical Plant;
- development of operating procedures to design the upgrade of copper production based on the new roast-leach-electrowin technology at Kola MMC;
- development of operating procedures and feasibility study for the process to neutralise sulphuric acid with natural limestone.

Environmental protection

- development of operating procedures and feasibility study to produce elemental sulphur;
- inventory of air emissions and development of draft limits for maximum permissible emission at Polar Division's core production facilities;
- comparison of the technology for producing sulphuric acid and neutralising it with natural limestone vs elemental sulphur production technology used at Nadezhda Metallurgical Plant.