Successful teamwork between the new owner of the Sasa mine – Russian company Romtrade – and Atlas Copco, is gradually transforming an outdated mining operation into a modern and productive business.

The Sasa mine is located about 150 km east of Skopje, the capital of Macedonia, in the Osogovo mountain region. In 2001, ore production was below 350,000 t per year. Today, production is up to 700,000 t/y and expanding to 850,000 t/y through the re-opening of an old mining area.

Sasa closed down six years ago and did not produce for four more years. But profitability is being restored at the Sasa mine, one of the most important base metal mines in the Balkans, following new investment in modern equipment and a programme of dedicated service and maintenance. M&C investigates.
with a combined lead/zinc grade of about nine percent, it was considered to be worth the effort to revitalize. Ore reserves are estimated to be more than 96 Mt, containing zinc, lead and silver.

**Old deposit in focus**

To expand ore production, the focus at Sasa is on an old mining area in the southern part of the deposit called Golema Reka. Here the mine hopes to add 150,000 t/y to the 700,000 t/y already being produced in the Svinja Reka part of the mine.

Golema Reka uses the cut-and-fill method and a 1.2 m-wide conveyor for ore transport to the surface while Svinja Reka uses room and pillar mining and sublevel caving with ore transport by rail or by the mine’s two Atlas Copco MT2000 trucks.

A number of adits driven into the mountain sides access both mining areas. In the future, Sasa plans to sink a 1,250 m shaft to access deeper parts of the orebody.

The main adit into Svinja Reka is at an elevation of 1,058 m, while the southern part of the deposit (Golema Reka) lies below that elevation. Within Svinja Reka the deposit extends for a vertical height of over 700 m, which uses gravity for the orepass transport of ore, de-watering, and air circulation within the mine.

**Financial support**

Atlas Copco started to support the mine on a small scale in the 1990s by providing the financing for some of the equipment. Atlas Copco is now supporting the re-opening of the mine by granting a credit facility, covering mining equipment, of about USD 4.5 million.

Financing has been provided by Atlas Copco Finance, Atlas Copco’s in-house finance company, and included a six-month period of grace in order for equipment to be in place and working before repayment of the credit began, thereby reducing the pressure on cash requirements during the start-up phase.

Since March 2006, Atlas Copco has delivered two MT2000 trucks, five Rocket Boomer 281 rigs (equipped with COP 1838 drifters), six Scooptram ST3.5 LHDs and a reconditioned ST2D. The ST3.5 vehicles are equipped with 1.7 m³ buckets as the ore is heavy and very abrasive.

Other equipment includes two reconditioned MT 413 trucks, five older Rocket Boomer 282 rigs (of which two have been converted into charging platforms by the Atlas Copco distributor in Macedonia, Universal, three Simba 157 drill rigs and a Boltec 232 bolting rig which installs Swellex roof anchors, Split Sets and Bulgarian-made TFA roof bolts.

Roof conditions present problems and a lot of timber sets still have to be used to back up the roofbolting. Many of the areas left after mining become cracked and fractured. As far as possible, development is restricted to small galleries with cross sections of only 25 m².

For exploration, Sasa has two Atlas Copco Craelius coring rigs – a Diamec 232...
and a Diamec U6 – for deep hole drilling down to 1,000 m. The latter will be a key machine in the geology department’s plan for a comprehensive ore reserve investigation. This will involve deep holes of 450–750 m.

Service – the driving force

An extensive service agreement has been a key driver on the journey back to profitability. The agreement covers spares, service, logistics, training and technical support and involves a total of 19 people. For rig maintenance, there are 13 technicians employed by Universal (Atlas Copco Central Europe’s local distributor). Additionally, there is an Atlas Copco manager onsite and five more technicians dedicated to the regrinding of Secoroc bits. The service team is co-ordinated by Atlas Copco CMT Central Europe – a division that has responsibility for 11 countries in the central European region.

Drilling in the lead and zinc ore, the bits achieve 50–60 m per regrind and 15 regrinds are carried out over the bits’ life. These are generally 45 mm bits, with 51 mm bits for fan drilling. The mine undertakes 60–65,000 m of 45 mm production drilling every month and is achieving bit life of more than 800 m.

There are four, well-equipped Atlas Copco containers at the mine – one for ROCKHOSE assembly, one for service work, one for spare part stocks and one for stocking Secoroc rock drilling tools.

The mine also uses ProMaint, an Atlas Copco tool for managing service agreements. With ProMaint, the emphasis is on achieving the highest availability, the lowest running cost per hour, spare parts on time and full information on maintenance indicators.

Information on maintenance indicators covers availability, utilization, Mean Time Between Failure (MTBF) and Mean Time To Repair (MTTR).

ProMaint’s functions include component management, record of task, projection of life of spares and components and spare parts planning. It also produces reports on rig availability and utilization levels.

Sasa mine has 22 rigs and loaders currently being managed by ProMaint and each month the mine’s management is informed of various aspects of utilization and availability.

Dmitry Kudryakov, General Director of the Sasa mine, says: “As with any mine, we have differing priorities, with production sometimes reluctant to let machines go out of service for the pre-planned maintenance. Nevertheless, the system is working well.

“Many of the Sasa engineers involved here do not have a lot of previous experience of maintenance planning, but they have shown a great willingness to learn and understand the value of high quality equipment care.”

Atlas Copco’s Martin Karlsson, Area Manager, Aftermarket, points out that the agreement states that availability of the Rocket Boomer rigs should be no lower than 82 percent and no lower than 75 percent for the LHDs. “Currently, all equipment is averaging more than 90 percent availability – that’s well above the minimum levels,” he says.

Footnote: The revitalization of Sasa Mine has also been positive from an environmental point of view. The new owner, Romtrade, is also taking measures to contain spillage from tailings that previously threatened to pollute local drinking water supplies and irrigation water for farmland.