

Technology and services: the innovation push

Companies need to invest some time and money to think outside the box

Faced by challenging economic scenarios, companies have a dilemma to solve: they can do things the same way that they have been done for years, lower some targets, and try to decrease costs in the hope that the storm will pass soon. Or, they reflect and strategize about how to be efficient and profitable even if the storm becomes permanent.

The second option requires more time, creativity and, initially, money in most instances, but it is the long-term results that will prove the adequacy of this strategy. For miners who look at a 20, 30 or 50-year horizon, constantly rethinking processes will certainly pay off.

“Miners need to ask themselves: what I can do that will increase my bottom line, without compromising the future of the operation? Can some capital costs for infrastructure be deferred? Can we modify the schedule to defer waste and bring high grade forward? Can we decrease the dilu-

tion of the ore? Is the mine optimized for the prevailing commodity prices?,” explains Paul Murphy, Lima Manager at Mining Plus, an Australian engineering consultancy.

The research and development (R&D) support that providers can bring to the industry is invaluable. Certimin, a large laboratory, has created a new position exclusively dedicated to new technologies. After investing in a mini flotation pilot plant last year, which is already working on several projects for an important base metals producer in the country, the company is introducing aerophotogrammetry services with drones that add to its previous offer in geochemical, metallurgical and environmental analysis.

“Aero-photogrammetry offers multiple applications: we obtain very valuable data to measure the pit and the progress on mineral extraction, to carry out volumetric control, to manage inventory and planning for stockpiles and waste rock dumps, to detect acid concentrations in leaching

pads, to monitor tailings dams and handle geomechanical aspects, among others in the engineering, control and safety areas,” explains Luz Blancas, commercial manager of Certimin.

Álvaro Salazar, general manager of Certimin, assures that “innovation is a fundamental value. In a time where the priority is reducing costs, we are tackling this problem by boosting productivity through new technologies. Analytical services have become a commodity, so we need to differentiate ourselves in other areas. We cannot just start a price war, because that would not be sustainable”.

Exsa, a blasting solutions company, is also reaping the fruits of its R&D activities by introducing a new explosive technology to the market this year, called Quantex. It uses high-density ammonium nitrate, which is easier to source if compared to the traditional, porous ammonium nitrate. Gustavo Gómez Sánchez, commercial manager of Exsa, gives more details: “The main use of this technology is rock fragmentation in surface mining. The product offers cost savings of 15% to 20% and further significant savings on the operational aspects, as well as up to an 18% reduction in greenhouse emissions. In Peru, both Southern Copper, in Toquepala and Cuajone, and Newmont, in Yanacocha, are already using this product.” Exsa is expanding its scope, opening up operations in Chile and increasing its service offering beyond the mere provision of explosives, with activities such as secondary drilling or the design and construction of explosives warehouses within projects such as Minsur’s Mina Justa and MMG’s Las Bambas. Product-wise, the company’s R&D department is working to improve its underground explosives offering, with a focus on dynamite.

Also in underground operations, local equipment manufacturer Resemin has just introduced a new micro-jumbo, the Muki, which is designed to work in extreme narrow-vein operations and allows for mechanization in tunnels where traditional methods were the only option. This has important implications safety-wise (see following article), but

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managing director,
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it also increases productivity, as explained by Resemin's managing director James Valenzuela: "The Muki can radically change mining in extremely narrow veins worldwide. There was not a machine with these features in the market. It is a micro-jumbo with a width of 1.05 meters and can drill a 2.4-meter hole in 40 seconds, as opposed to seven minutes with traditional methods." The Muki is already operating in one of Castrovirreyña's mines in Peru, and Valenzuela expects to sell it worldwide. Resemin exported 43% of the machines that it produced last year.

Meanwhile, global manufacturer Atlas Copco is introducing the Simba S7 C long-hole drill, which incorporates a computerized system, and a new hand-held hydraulic rock drill. Atlas Copco's general manager in Peru, Brian Doffing, provides more insights about the latter: "Peru is one of the two countries that we have selected to do the trials for this product. It can drive efficiencies up by at least 25% over traditional pneumatic drills in hard rock applications."

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- Paul Murphy, Lima manager, Mining Plus

The need for innovation is not just a result of lower market conditions in the mining sector. Peru offers other challenges in terms of social relations, for instance, that push providers to source locally and provide business opportunities for the communities; or serious infrastructure shortages, that affect the economic indicators of projects before and during the operation.

“Peru’s main challenge is its infrastructure deficit. As soon as you go out of Lima, the roads are in very bad condition. Without the necessary infrastructure of roads, energy and ports, all costs go up. There is this belief that companies must do the State’s work, and that way corporate social responsibility becomes public charity. The State should provide the necessary services so companies can operate,” affirms Carlos Soldi, general manager of SVS Ingenieros, now part of SRK, an international engineering consultancy.

Among others, bad infrastructure becomes a headache for transportation companies, which see their safety and timely deliveries

compromised. Moving the necessary parts and equipment to the mining operations in very remote areas requires a whole engineering job, says Carlos Roldán, general manager of Stiglich Transportes: “Along the coast we have better roads, but they go through cities that have practically invaded the road, so there is high risk of accidents and human life loss. Also, there are so many intersections that the speed is very low. Taking oversized cargo from Callao to the south, for instance, can take us five days. We need to move by night, remove traffic lights and pedestrian bridges, and put them back on immediately after. Sometimes our work starts one year before.”

The mining industry will never stop facing challenges, from lower grades and higher processing volumes to managing water and tailings dams. In this environment, providers will play a key role in supporting the miners with new ideas, as long as mining companies themselves also dedicate some people to listen and evaluate these new ideas as well.



Carlos Soldi, general manager, SVS Ingenieros (SRK)

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Mining safety

'Zero' is more than a simple number

Peru's mining industry suffered 32 fatalities in 2014, a 32% reduction year-on-year. The downward trend seems positive, but surely the relatives of those who died on mining duty will not care about this. Indeed, human safety is that particular parameter where numbers never add up, unless there is a zero at the end of the spreadsheet; hence, the need remains for the industry to keep working on how to reach that goal.

The safety challenge involves a multi-disciplinary approach: from continuous innovation in new, safer technologies, to intensive education and training to ensure that all workers not only understand how to follow the right procedures, but also are dedicated, 100% of the time, to their own safety and to the safety of those around them.

Peru has been a mining country for centuries, yet the experience of such a long history extracting metals does not take out the need for intensive training in this matter. In the words of Steve Dixon, CEO of mining contractor Stracon GyM, "the mining industry in Peru has experienced very strong growth over the last years, and it will grow again after the current slowdown. This means that a lot of inexperienced, young people will enter the industry, and keeping these people



Lowering accident rates requires a combination of new technologies, safe procedures and awareness among workers. Photo: Constancia mine, courtesy of Stracon GyM.

safe will be a huge challenge. The process is never going to end because everyone needs to return home safely every day". Looking at the cold numbers from 2014, rockfall accidents accounted for 28% of deaths, followed by traffic crashes, which were 25%. While accident rates have consistently declined in recent years, Peru's Institute of Mining Safety (ISEM) is implementing a program with associated companies that aims to have zero fatalities by 2021 (see interview on next page).

Innovation and awareness

Creativity is a key ingredient in the industry's drive for lower production costs. The good news about this compulsory bias towards innovations is that better technology and processes have a positive impact on safety. Bearing in mind that a majority of deaths in Peru happen in underground mining environments, mechanization is a key aspect to take operators out of the line of fire.

As portrayed in the previous article, local equipment manufacturer Resemin has come up with a small jumbo, the Muki, for very narrow vein operations. According to James Valenzuela, managing director of Resemin, "old mining was built on rails and wooden frames; many mines are going back to that standard, which poses high risks for operators. It is inconsistent with modernity, but the problem is that until now there was no equipment in the market for these types of veins".

As underground operations go deeper, Peru can learn from the experience of other mining countries, namely South Africa. International engineering firm WorleyParsons, for instance, acquired TWP of South Africa in 2012, and incorporated important expertise designing shafts and introducing mechanized mining models. The company is currently developing two shafts for Peruvian clients. "In Peru there are not many underground miners that have mechanized and modernized their operations. Tradi-

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