

NEW OVERLAND CONVEYOR SYSTEM

*Powered by
Baldor Products*

**HELPS GOLD MINE
IMPROVE EFFICIENCIES**





Mine officials wanted a packaged solution that would provide a smooth, soft start but was also powerful enough to pull a heavily loaded belt up 1,890 feet with a 226-foot lift. The solution: a Baldor•Dodge® MagnaGear® right-angle reducer and a custom 500 HP Baldor•Reliance® motor with an integrated backstop, mounted on a heavy-duty swing base. A Baldor•Dodge fluid coupling provides the soft start. The rest of the Baldor•Dodge package includes a custom-engineered moment coupling, MDX® pulleys and bearings.

Argonaut Gold Inc., a Canadian gold mining company, acquired its El Castillo gold mine in 2010. Located in the state of Durango, Mexico, the open-pit, heap-leach mine has approximately 1,285 hectares of mineral concessions and surface rights, and hosts 1.23 million ounces of proven and probable gold reserves (as of 11/8/2010).

When production began, ore was being hauled from the excavation site using 100-ton-class trucks, but in 2012, mine management made the decision to invest in an overland conveyor system as a more cost-efficient method to move the crushed rock.

For help, Argonaut turned to Goodfellow Crushers, an OEM specializing in the mining industry that had already supplied crushers for the El Castillo project. Goodfellow CEO Kurt Goodfellow says Argonaut Gold was looking for some very specific results.

“They wanted a system that could run 1,500 to 1,800 tons per hour that would run up and over their pit to the leach pads,” explains Goodfellow. “To accomplish this, we needed to build three 48-inch conveyor systems, totaling 1,890 feet in length. The project also needed to include a series of 21 portable transfer conveyors, better known

as grasshoppers, along with a large telescoping radial stacker.”

Due to the sheer scope of the project, Goodfellow says his company wanted to partner with one supplier that could not only provide all of the components, but could also offer mining industry expertise and engineering support. He says his company has used Baldor products for years on its equipment with great success, so working more closely together on this project made sense.

Product selection for the grasshopper conveyors was fairly easy, because Goodfellow says he knew the company

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Kurt Goodfellow,
CEO,
Goodfellow Crushers

wanted to use its standard selection of Baldor•Dodge products, including Torque-Arm® II reducers, S-2000 bearings and Mine Duty Extra pulleys, along with Baldor•Reliance motors. The bigger question, according to Goodfellow, was what products would be best for the three overland conveyors.

“We relied heavily on Baldor’s mining industry team to give us



Due to the sheer scope of the project, the OEM wanted to partner with one supplier that could not only provide all of the components, but could also offer mining industry expertise and engineering support. According to mine officials, El Castillo’s overland system – powered by Baldor products – is working well, and they are pleased with the project.

recommendations and the package requirements,” says Goodfellow. “This team did the belt analysis to make sure that the gearboxes, motors, pulleys, bearings – really the whole system – was sized properly for this application. While we have our own engineers that can do this same work, this kind of support allows us to use our engineering resources in other ways. So it saves us time, but more than that, when the Baldor industry team does the work, we can rest assured that it was done right, and that’s a big help.”

The challenge for Baldor engineers was to put together a package that would provide a smooth, soft start but would also be powerful enough to pull a heavily loaded belt up 1,890 feet with a 226-foot lift. The solution was a Baldor•Dodge 920 MagnaGear right-angle reducer and a custom 500 HP totally enclosed, fan cooled Baldor•Reliance motor, a package providing a million inch pounds of torque. A Baldor•Dodge fluid coupling provides the soft start of around half a minute that prevents belt jerk and minimizes belt tension. The rest of the Baldor package includes custom-



Baldor•Reliance Super-E® premium efficient motors and Baldor•Dodge Torque-Arm II gear reducers, chosen because of their superior performance and reliability, power the 21 grasshopper conveyors supplied for the El Castillo project.

engineered Dodge® DM Moment couplings, Dodge-engineered and Mine Duty Extra pulleys, and Dodge USAF and Type E-Xtra bearings.

Not only was Goodfellow satisfied with the product selection, he was also pleased to learn about a value-added

service provided by Baldor’s System-1™ group. This team facilitates the design, quotation and order processing of multiple products into a complete packaged solution, arranging for equipment to be preassembled and shipped to the customer location.

Tom Childs, Goodfellow’s project manager for the El Castillo job, says when you consider the number of gearboxes, motors, pulleys and bearings required for the project, especially the 21 grasshoppers, getting the System-1 group to handle the packaging offered a tremendous amount of value.

“Because of the number of conveyor belts for this project, we were very happy to get the support from the System-1 group,” says Childs. “It was very helpful to have the products delivered preassembled so we could just bolt equipment onto the conveyor and be ready to go. This saved us valuable time and energy, especially on a project of this size.”

Childs also gives high marks to the Baldor team for its flexibility and willingness to work through some of the unique challenges a large project like this can bring.



Baldor’s System-1 group facilitated the order processing, packaging and preassembly of the Baldor equipment for the 21 grasshopper transfer conveyors. Because of the number of gearboxes, motors, pulleys and bearings required, Goodfellow managers say the System-1 team saved them valuable time.

“Our team had great interactions with the Baldor team,” says Childs. “We have developed a good relationship that will only get better as we go along. By working together, we delivered a successful project for the El Castillo mine, giving the customer the equipment that will provide the performance and longevity needed to make the mine productive well into the future.”

El Castillo Operation and Maintenance Superintendent Nahum Zavala is equally satisfied with the project. He reports that the overland system is working well saying that not only is this a more efficient method of moving ore, it’s also less expensive than running haul trucks, especially when you factor in the cost of building and maintaining roads. And when it comes to performance, Zavala says they are getting exactly what they asked for.

“We are getting the soft starts that we need with this equipment,” says Zavala. “Because the coupling transmits the torque, it helps smooth out the start, so there is less stress on the belt and all of the other equipment. And because there are no shock loads, the belt and the rest



This Dodge DM Moment coupling is specifically designed to make the rigid connection between the output shaft of the gearbox and the head pulley. Custom-engineered for each application, the DM Moment coupling is capable of handling both the torque and the bending moment forces of the suspended weight of the drive package, including the gearbox, motor, fluid coupling and swing base. This design also allows for an alignment-free drive by eliminating the time-consuming process of aligning the gearbox assembly to the head pulley shaft.



of the equipment is going to last longer. So we have the smooth start we want, but then we have the power we need to pull the long conveyors. Overall, we are very pleased with this project.”

Baldor•Dodge USAF spherical roller bearings and Type E-Xtra tapered roller bearings were selected for the overland conveyors. Harsh-duty sealing systems will extend bearing life and increase reliability.