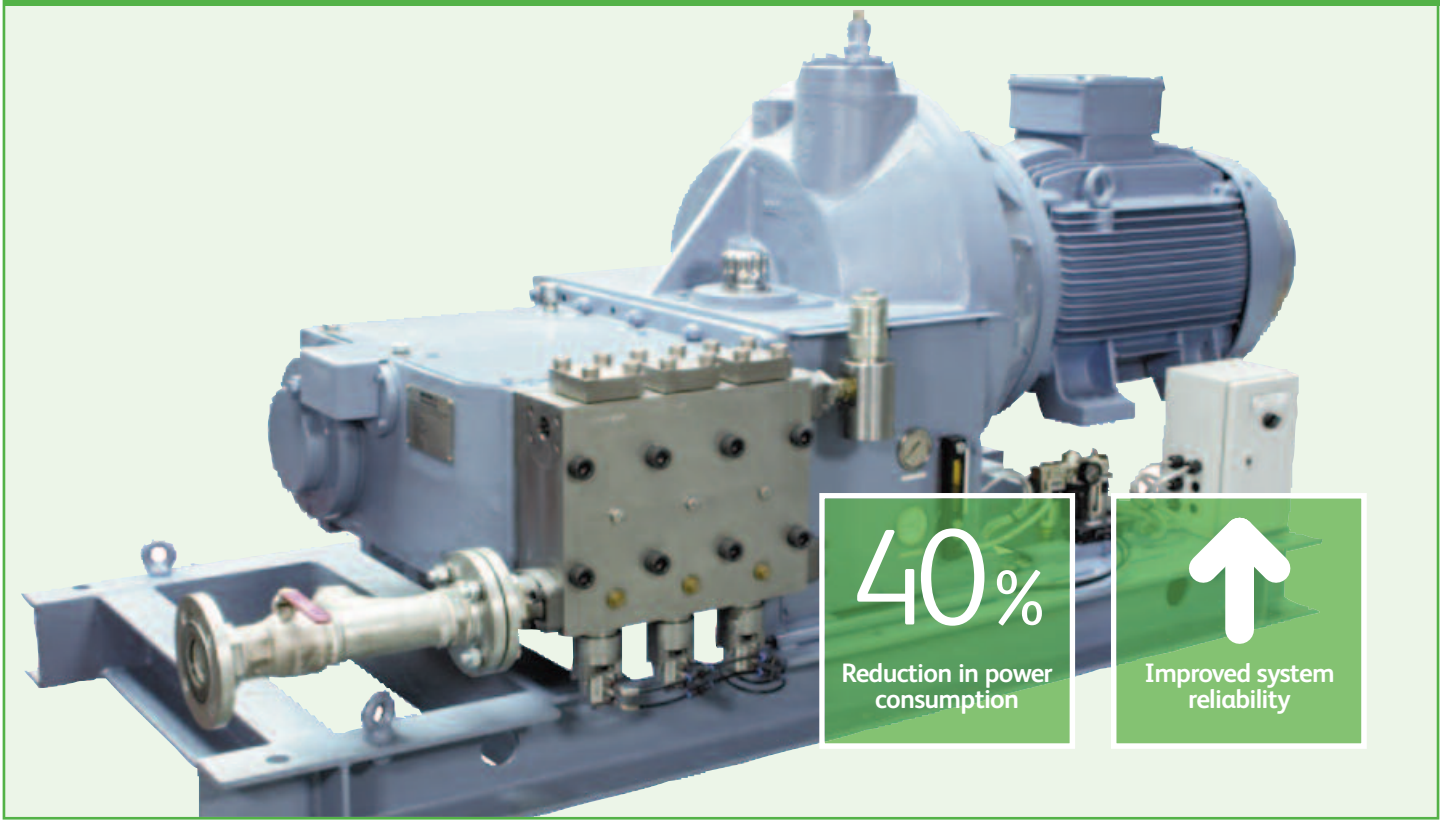
Metso Minerals

Reduces power consumption and significantly improves system reliability



Metso Minerals Division, the leading global supplier to the quarrying and aggregates sector. Metso supplied a tube press system to a steel mill service contractor and subsequently approached RMI to explore improvements to the waste oxides filtration plant.

Project Background

The system removes waste iron from a furnace exhaust along with other waste products. The ore is transported in water, which becomes a slurry, and is then extracted by using high pressure pumps to squeeze the slurry through a filter. The resulting iron ore is re-processed into bricketts for recycling.

The existing system, based on a high pressure rotary pump with a 75kW motor, had a number of shortcomings. The demand on the high pressure pumping system varies with production requirements and overall levels of efficiency were low. The system was vulnerable to cross contamination and, as the rotary pump was operating at high speed, this caused unacceptable levels of system failure and downtime.

The requirements for a replacement system included:

- The pump unit had to cycle on load - off load, every five seconds.
- The accumulators had to operate within 10% of the system's nominal pressure, with the option that this could be adjusted down to 5%.
- Error-free 24 hour operation, 7 days a week.

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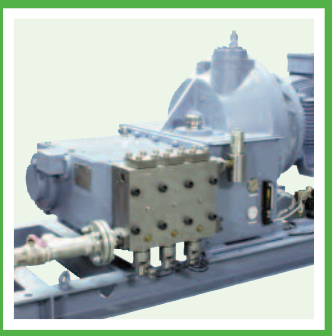
PRESSURE SYSTEMS

1. **Commissioning Visit**
   Fine tuning the pumps and controls to match the required duty.
2. **Metso Tube Press**
   Used to squeeze the slurry and extract iron ore.
3. **RMI's S75 pump**
   Complete with unloading system to meet the rapid duty changes.



Solution

Working in collaboration, Metso and RMI developed a more effective system which offered immediate improvements and has continued to deliver significant energy savings and improved carbon footprint.

The solution provided by RMI harnesses the high efficiency capabilities of positive displacement pump technology. It is a bespoke system designed around reliable, heavy-duty, S75 Trimax pumps with a set of accumulators, and nitrogen-charged back up bottles. The system is fitted with adjustable flow mechanisms and safety devices to ensure that the tight hysteresis of the system is achieved.

Benefits

As positive displacement pumps manage demand far more efficiently than rotary pumps, the size of motor for the new system could be much smaller - just 45kW instead of 75kW - offering a 40% reduction in the power required and reducing the operating costs significantly.

System Reliability

In addition to being inherently more reliable as a result of its design, the RMI system incorporates built-in health monitoring. System performance data is fed to a remote PLC enabling engineers to anticipate and remedy any potential system failures before they occur. This has proved valuable as the equipment is located in pump houses that are not regularly attended.

With a long history of designing pumps for hostile environments, RMI's range is characterised by heavy duty design and construction (resistant to attack from heat, water, acidity and dirt etc) which prolongs equipment life and extends the running time between routine maintenance. Enclosed construction of the pump systems prevent the ingress from contaminant's and integral water cooling aids economical operation even in confined, or hot, spaces.

After-sales Support

RMI's relationship with Metso includes a programme of continuous improvement. Following the initial installation RMI have further reduced the energy consumption by introducing the latest variable speed drive technology. This has provided an additional 5% -10% saving in power.

Energy Savings

Energy Cost Rotary Pump	£60,480
Energy Cost RMI Pump	£36,288
Cost saving per annum	£24,192

Service Savings

Maintenance time	£5,040
Spare parts	£2,350
Total cost savings	£7,390

Installation Costs

Pumps	£18,000
Controls	£1,200
Total additional costs	£19,200

Payback Period

7 months

"We have traditionally used rotary pumps for this application but the RMI engineers convinced us of the reliability we could expect from their positive displacement pumps, we have not been disappointed!"

METSO MINERALS DIVISION

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