



FLEXIBLE, ECONOMICAL SOLUTION RETURNS AGEING FILTER TO OPTIMUM PERFORMANCE AT MMG ROSEBERY

When an operational filter reaches 30 years old at any site, it's a significant milestone. Built in 1987 and beset with premature wear, ageing parts, and recurrent corrective maintenance, the standard response might be to replace with a new filter. At MMG Rosebery,

however, with Outotec's help, they opted for an environmentally-friendly and more cost-effective solution, completely refurbishing their ageing filter and training their operators at the same time.

CHALLENGES

- 30+ year-old filter, frequent corrective maintenance
- Premature wear on key items
- Reduced reliability
- Irregular preventative maintenance programme

SOLUTION

- Flexible, partnership approach with customer
- Economical design with new, refurbished and on-site stock
- Supervision of refurbishment and commissioning
- Maintenance & operation training, full documentation support
- Ongoing filter support

RESULTS

- Improved availability
- Optimised reliability
- Latest filter procedures and practices embedded at site

Headquartered in Melbourne, Australia, MMG Limited is a mid-tier global resources company that mines, explores and develops base metal projects around the world. They operate and develop copper, zinc and other base metals projects across Australia, the Democratic Republic of the Congo, Laos and Peru. They also have significant exploration projects and partnerships across Australia, Africa and the Americas.

Operations

MMG's Rosebery is an underground polymetallic base metal mine located in Tasmania, Australia. It has operated continuously since 1936. Zinc, lead, copper concentrates and gold dore are produced at Rosebery, using mechanised underground mining methods, then crushing, grinding and flotation processes. Rosebery produced 74,803 tonnes of zinc in zinc concentrate and 26,611 tonnes of lead in 2017.

Background

When an operational filter reaches 30 years old at any site, it's quite a significant milestone. Built in 1987, beset with premature wear, ageing parts, and recurrent corrective maintenance, the standard response might be to replace the old filter with a new unit. At MMG Rosebery, however, they went for a different approach.

In April 2017, MMG Rosebery engaged Outotec to review its filter equipment and filter maintenance programme. This initial audit included assessing the physical condition of filters 1, 2, 5 and 6, as well as a review of regular and preventative filter maintenance practices.

The four pressure filters at Rosebery were all ageing, requiring regular unscheduled maintenance. The filter

in most urgent need of attention was Filter #6. Outotec reviewed various options, including purchase of a new hydraulic filter. Apart from capital cost, a hydraulic filter would necessitate new flooring in the filter room, an expensive undertaking. Although refurbishing the old filter would be complex, this challenging project could be delivered with meticulous planning and a partnership approach between Outotec and MMG.

Scope

Following this audit, Outotec was tasked in May 2017 with the design to refurbish filter #6. The scope comprised design, supply of all new and refurbished components, with Outotec providing supervision services during on-site refurbishment and filter commissioning. Outotec was also to deliver filter training services to Rosebery maintenance and operations personnel, along with full documentation support.

Partnership and communication

It was a complex project to manage, so a partnership approach and regular communication between Rosebery and Outotec was critical. Explains Matt Orton, Maintenance Superintendent at Rosebery "Outotec's project planning and preparation was excellent. We were regularly appraised regarding progress of the build and dispatch from Europe"

Internally within Outotec, we conducted weekly meetings between various project teams in Australia and Finland, covering manufacture, delivery and installation. All possible bottlenecks, risks or delays were proactively eliminated. Progress updates via QA reporting milestones were then regularly communicated to MMG Rosebery.



Plate pack ready for strip down.



Foundation part installed and levelled.



Filter plates assembly work in progress.

Expertise and planning

Although the filter was 30+ years old, Outotec's database was such that it could locate original site drawings, saving valuable time. This also quickly ensured an accurate, comprehensive list of mechanical filter components. With an established reputation and extensive experience in filter upgrades and refurbishments, Outotec was familiar with the challenges and pitfalls of such a complex job.

Explains Matt Orton "Outotec sent one of its filter technicians for a pre-shut audit to ensure an efficient installation. We avoided any last minute delays with this initiative". As Rosebery was using a mixture of new components, on-site refurbishments and site spares stock, this audit proved invaluable.

Two additional site days were spent by the filter technician on pre-planning and methodology for stripping and refurbishing the components. The experienced technician also ensured all components, refurbished and original, were organised in a manner to ensure an efficient and seamless install.

Filter refurbishment

As part of the scope, Outotec provided advisory services to oversee the filter rebuild. Two Outotec filter experts arrived 13 March 2018 just prior to site outage. They met with the Rosebery team to identify safety hazards and finetune the filter refurbishment plan. Once the filter was stripped down and all unusable parts removed, the refurbishment of the filter began.

New components included the plate pack, top and bottom pressing plates, foundation plate, filter base frame, pinch/butterfly valves, process feed/filtrate and pressing water hoses, cloth wash spray bars, cloth wash filter strainer, cloth tensioning unit and cloth drive unit.

The existing front vat tray was cleaned and reused, with vat rollers replaced. Some existing components were refurbished, including filter columns, closing device scissor and plant process pipelines. The original cloth tension/cloth drive motors were in good working order, so were included in the rebuild. Serviced spares from Rosebery's stores, such as the motor for the closing device, were also used.

Outotec filter experts and MMG's installation team split into day and night shifts for the refurbishment. Round-the-clock commitment delivered a refurbished filter two days ahead of schedule, on 23 March 2018. Importantly, the refurbishment also occurred with zero injuries at site.

"The technical support from Outotec was tremendous. Their technicians knew absolutely everything about the filter, they were walking encyclopedias", Matt Orton, Maintenance Superintendent, MMG Rosebery

Commissioning and advisory services

Refurbishment complete, it was now time to return the filter to production and test it. The Outotec filter experts spent many hours observing the new filter in operation, as well as the overall process and other relevant OEM equipment. Outotec's resulting report included operational set points and procedures to ensure the filter operated optimally.

New procedures and documentation

With the refurbishment complete, MMG Rosebery were keen to ensure its filter procedures and documentation were updated. So another critical element of Outotec's scope was provision of documentation to support maintenance and operation of this modernised filter. Daily maintenance procedures, operation and maintenance manuals, as well as critical spares management lists were part of the documentation.

Training and support services

Training also formed a key part of Outotec's scope. In June 2018, Outotec delivered a training programme to Rosebery maintenance and operation staff. The programme comprised routine and preventative maintenance procedures and tasks (including work instructions, operator check lists and standard operating procedures).

A further component in MMG's strategy for optimized filter performance includes ongoing services and performance assessments from Outotec filter technicians. These visits have been useful to Rosebery, embedding the updated procedures and helping further finetune filter operation and maintenance. Outotec also offers 24/7 technical phone support via its local Tasmanian filter technicians.

In Q4/2018 Outotec is scheduled to refurbish a further two filters at Rosebery.

“In terms of availability and reliability, both have improved since the refurbishment. Our filter is working wonderfully and is exactly what we wanted from this project”, Matt Orton, MMG Rosebery. “The training and ongoing support has also been very beneficial”



Top pressing plate installed.

Summary

The Outotec team partnered with MMG Rosebery to deliver the refurbished filter. This partnership approach, with regular two-way communication, was critical to a timely and cost-effective completion of the complex refurbishment.

Through the usage of new, refurbished and on-site stock, an economical solution was delivered. Outotec provided advisory services to oversee the filter rebuild, which was completed two days ahead of schedule. Additional services, including training and ongoing filter servicing, have also been delivered by Outotec.

Since the refurbishment, both availability and reliability have improved. Outotec's training and ongoing filter support have helped with embedding the latest industry practices and procedures at site.

Two more filters will be refurbished at Rosebery in Q4/2018.