



PRESS RELEASE

## **SMC Australia's Air Servo Technology Unlocks Critical Yield Gains at Northparkes Copper-Gold Operation**

In a major validation of how precision automation directly impacts metallurgical yield, a landmark technical paper showcased a collaborative engineering initiative between [SMC Corporation Australia New Zealand](#) and [Evolution Mining's](#) Northparkes Operations and how it successfully improved flotation circuit stability and level control accuracy.

By replacing traditional mechanical positioners with SMC's specialised IN-777 Air Servo Cylinders, the operation achieved an immediate 56% reduction in flotation cell level variance. This foundational stability paved the way for advanced real-time AI process optimisation, ultimately driving a 1.21% increase in copper recovery across the circuit.

### **Optimising Flotation Circuit Control**

Northparkes Operations - a premier copper and gold mine located in the Central West region of New South Wales - focused on further optimising circuit performance following a major flotation circuit expansion.

In flotation cells, maintaining precise slurry level control is key to stabilising froth velocity and maximising mass pull. At Northparkes, the natural slurry torsion exerted on the internal dart valves meant traditional mechanical positioner feedback linkages required frequent calibration and maintenance. This high mechanical variance impacted underflow control valve consistency, leading to slurry level deviations that could fluctuate by  $\pm 50$  mm.

### **The Solution: Non-Contact Precision Motion**

Speaking to the solution, Andrew McCluskey, Head of Sales for Western Australia at SMC Corporation says, "to mitigate these mechanical variances and streamline maintenance, Northparkes partnered with SMC Australia to implement a ruggedised, non-contact positioning system."

SMC deployed an innovative design consisting of:

- **A Heavy-Duty Floating Joint:** Installed between the piston rod and the adapter box, allowing the dart stem to naturally rotate under slurry torsion without transferring stress to the internal cylinder mechanics.

- **The SMC IN-777 Air Servo Cylinder:** A unitised, IP67-rated actuator engineered precisely for harsh mineral processing environments, substituting mechanical feedback linkages with an integrated, highly accurate magnetic position feedback sensor.

The impact on valve performance was instantaneous. The full-stroke travel time of the valve assembly was optimised from 30 seconds down to just 4.5 seconds, allowing the system to counter upstream process surges in near real-time.

The optimised speed capability of the IN-777 allows the automation system to respond rapidly to shifting process conditions, maintaining a constant froth velocity. By introducing high-fidelity, multipoint linear positioning repeatability into the plant, this technology enables operations to transition away from traditional, maintenance-heavy mechanical linkages and move toward a highly reliable, digital-ready ecosystem.

### Key Technology Evolution: Legacy Linkages versus SMC IN-777

Andrew breaks down the key differences between legacy actuators and SMC’s new-generation IN-777 series as follows:

Operational Parameter	Legacy Mechanical Actuators	SMC IN-777 Air Servo System
Feedback Mechanism	Mechanical linkages	Integrated Non-Contact Magnetic Sensor (wear-free precision)
Full-Stroke Response Speed	~30 seconds	4.5 seconds (rapid surge suppression)
Level Control Tolerance	Slurry level deviations up to $\pm 50$ mm	Stabilised consistently down to $\pm 10$ mm and $\pm 5$ mm
System Architecture	Separate components, exposed wiring	Unitised All-in-One Design (Controller, servo valve, and sensor built-in)

### From Stabilised Hardware to AI-Driven Recovery Benefits

While securing a 56% reduction in level variance delivered immediate process consistency, the ultimate dividend came from what this baseline stability enabled. Once the IN-777 cylinders secured predictable, high-precision level control, Northparkes successfully activated **ESTIMATA** - an advanced, cloud-based real-time process optimiser.

ESTIMATA dynamically calculates circuit mass balances and transmits optimised froth velocity set points to the plant's PLCs every five minutes. Backed by rigorous on/off plant trials across a 15-week period, this seamless combination of dependable SMC hardware and intelligent software

orchestration verified a 1.21% aggregate copper recovery benefit, delivering immense commercial value directly to the bottom line.

### **Experience the IN-777 Live at Future of Mining**

SMC Corporation is proud to announce its role as the **Platinum Sponsor** of the upcoming **Future of Mining** exhibition, taking place from **16-17 June at Crown Perth**.

Attendees, site metallurgists and industry executives are invited to visit the SMC pavilion to interact with a fully functioning, live display of the [IN-777 Air Servo Cylinder](#). Discover firsthand how upgrading the fundamental physical layers of automation serves as the mandatory foundation for AI-driven process analytics and plant yield optimisation.

“We look forward to connecting with industry at this exciting event and showcasing the IN-777 and its many benefits” Andrew concludes.

### **Note to the editors:**

#### **About SMC Corporation**

SMC Corporation Australia & New Zealand is the regional arm of SMC Corporation, a Japan-headquartered company focused on industrial automation solutions. Founded in 1966 as the company’s first overseas subsidiary, SMC ANZ has established a strong presence across Australia and New Zealand, supported by a network of offices, local engineering teams, and manufacturing and assembly capabilities.

The company offers a comprehensive range of automation technologies, including pneumatic and electric actuators, air preparation equipment, directional control valves, fluid and temperature control systems, vacuum products, sensors, and static control solutions. This extensive product range supports a wide variety of industrial automation applications.

SMC ANZ combines global product development with local expertise, enabling it to provide customised solutions, responsive technical support, and efficient supply. The company works with customers across industries such as food and beverage, mining, packaging, medical, transport, and general manufacturing.

Through its integration with SMC’s global network, SMC Australia & New Zealand supports customers in improving operational efficiency, reducing energy consumption, and achieving more sustainable production outcomes.

Website: [www.smcanz.com](http://www.smcanz.com)

For sales enquiries please contact [AUsales@smcanz.com](mailto:AUsales@smcanz.com) or [NZsales@smcanz.com](mailto:NZsales@smcanz.com)

For editorial enquiries please contact:



[rene@positivltd.com](mailto:rene@positivltd.com)

Rene Rose

M +61 474 476344