



Mining for efficiency in heavy industry

How to address the resource challenge while maintaining safety and performance during planned maintenance shutdowns

Coates

Equipped for anything

During shutdowns and planned maintenance events, companies in the heavy industry sector face a common challenge. The need to improve operational efficiencies and site safety with fewer resources and a widening skills gap. It creates a Catch-22 situation for management in these industries. As large projects are constrained to tight schedules and require varied skillsets, as well as comprehensive equipment, tools and consumables, companies often engage external suppliers to provide these services. However, having multiple contractors on site for a maintenance event often creates its own set of problems and inefficiencies.

This white paper examines these pain points and provides a detailed insight into how businesses within the heavy industry sector can address them, with expert advice from national industrial solutions provider, Coates. Importantly, it includes case study examples from EnergyAustralia and Newcrest Mining Limited as to how they completed safe shutdowns, while saving costs and improving efficiencies.



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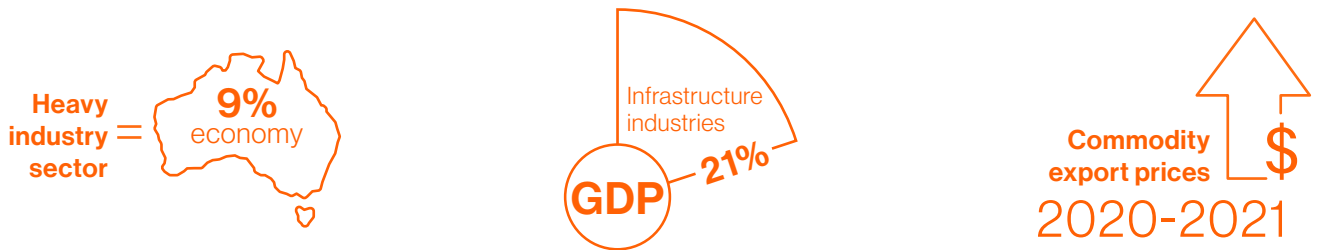
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An industry with heavy duties

Australia's heavy industry sector is essential to the nation's prosperity, accounting for 9% of the Australian economy directly¹. The sector processes minerals to produce materials such as iron, aluminium and cement, critical to the country's infrastructure industries, which additionally make up 21% of GDP². In the wake of the pandemic, demand for heavy industry product and services will intensify in Australia as public

infrastructure projects in the pipeline commence³. Likewise, the appetite for Australian mining product has increased, a fact reflected by record commodity export prices in 2020-2021⁴. As the world prepares to decarbonise, demand for raw materials from the mining and metal sector for that energy transition – for example, nickel for battery electric vehicles and copper for electrification – will continue to rise⁵.



Challenges amplified to meet demand

This overall demand on heavy industries has amplified the need to achieve productivity targets both during normal operations and when assets are offline for scheduled maintenance. Equally, it's exaggerated the resource challenge – a challenge further compounded by the pandemic.

In a late 2021 report, EY noted that: “The COVID crisis has simultaneously accelerated our economy’s digital transformation and put a halt to a key source of skills supply from overseas.”⁶

According to Jeff Allen, National Manager of Coates Industrial Solutions, the resource challenge is not new, but continues to evolve with the ongoing impacts of the pandemic and digital disruption. One significant side effect has been the postponing of maintenance events.

“Typically, heavy industry operations schedule shutdowns to perform critical maintenance on their assets. These planned maintenance events not only ensure that equipment is running optimally, but that infrastructure is in good condition and the site is safe to work,” explains Jeff, who has over 20 years’ experience in heavy industry, including 15 years setting up maintenance and supply chain hubs in the oil and gas sector in North America, Russia and Eastern Europe. “However, during the pandemic, some of these events were put on hold. For example, a power plant during the height

of pandemic restrictions may have deferred maintenance because the perceived risk of bringing the virus to site was greater than the need to perform maintenance.”

Subsequently, when COVID restrictions ease, Coates forecasts heightened demand for skilled personnel to perform maintenance.

“The constraints on personnel will be even higher because deferred maintenance will need to be performed,” Jeff states. “Heavy industry businesses need to improve their game and start mining the efficiencies that result from digital connectivity and reporting – such as more effective use of equipment and tooling.”

Moreover, while contending with resource shortages, industrial businesses still need to ensure they are adhering to strict safety standards and regulations.

“Safety, compliance and risk are a major concern for any industrial site. There can be no shortcuts and the level of compliance and investigation into safety absolutely means that it’s got to be done right the first time,” cautions Jeff.

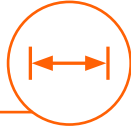
“The question is, how do you ensure you’re achieving this compliance while trying to save on costs and inefficiencies elsewhere if you have a deficiency on the resource front?”



Here, we look at six opportunities available to heavy industry businesses to address these challenges.



1. Engaging an end-to-end partner



For heavy industries, the answer to that question is often outsourcing to contractors, particularly on the maintenance and equipment side. However, the contractor model has its own limitations, and ironically, can create even more inefficiencies when several vendors are contracted to a site.

In a research analysis entitled 'Labour Hire & Contracting across the ASX100', the Australasian Centre for Corporate Responsibility notes that the predominant shift towards contract labour in the mining sector has resulted in negative impacts on worker safety, collaboration and innovation. It also cites research indicating an increase in fatalities and injuries in mine sites due to lack of skilled contract workers and training.

“Additionally, the presence of multiple labour hire agencies and service contractors can stymie the flow of information between workers and companies, undermining site safety and risk management,” the report states.⁷

To combat these challenges, companies within the heavy industry sector should consider engaging an end-to-end solutions partner to assist in managing maintenance events.

“In terms of operational efficiency, having the right people, at the right time and with the right tools can be challenging to coordinate if there are multiple contractors,” says Jeff. “Also, if planned maintenance works go over the allocated time, this results in additional downtime and cost overruns, which can have a significant impact on site production and profitability.”

This is where Coates Industrial Solutions have been able to make a significant difference for their clients in the heavy industry sector. The company offers a one-stop solution that combines equipment hire, tooling and consumables management with complete maintenance project support, from initial scoping and planning to data-driven optimisation and reporting.



“As a single source provider, Coates goes beyond the supply of equipment, tooling and consumables. We look after wide-reaching elements of the on-site programme or project, many of which are peripheral, yet essential, and too comprehensive for the client’s project management team to deal with on top of the larger issues,” Jeff explains.

“For example, heavy industry customers don’t want to have to worry about tool compliance, or whether the chain block is certified, or if someone is going to get hurt if a tool is out of calibration. But those safety requirements are significant and need to be managed. Coates Industrial Solutions removes the trip hazards associated with availability, quality and compliance of tooling and assets. This allows the customer to focus on the bigger picture.”

Likewise, from an administrative perspective, the benefits of having one provider supplying an end-to-end solution under one purchase order are substantial.

“The ‘power of one purchase order’ speaks to many of the services we bring to site but simplifies the process exponentially for clients,” says Jeff. “For instance, a procurement manager might typically work with three or four different vendors on tenders for elements of the job. Coates can wrap all these elements up into one tender, so there is one scope of supply, one single source and one purchase order to reduce administration and ensure a clear line of communication.”

2. Better scoping and planning



While periodic maintenance shutdowns are essential to most heavy industry operations, they are risky and expensive undertakings. Considering that every hour a site is out of production is likely to materially impact revenue, scoping and planning a maintenance event is critical.

By embedding experienced shutdown specialists in the project planning team, companies in the heavy industry sector can ensure they have the optimal mix of tools, equipment and support services to deliver an event safely and efficiently.

“Coates is a specialist in the industrial solutions space, and we apply our experience and capabilities to scope and plan out a customised solution for each customer based on data, insights and the lessons we’ve learned from a multitude of clients across the industry,” says Jeff. “While each project is unique, there are some consistencies in the challenges clients face. Our aim is to always use lessons learned and work collaboratively, starting from the scope of the event, which involves reviewing previous shutdowns and identifying any resource gaps and inefficiencies.”

To realise the benefits of Coates’ decades of experience, Jeff recommends that clients engage with Coates in the early stages of planning.

“Our aim is to always use lessons learned and work collaboratively, starting from the scope of the event, which involves reviewing previous shutdowns and identifying any resource gaps and inefficiencies.”

“With so much experience across multiple markets, we help our clients understand what is needed on site to fulfill the obligations of the different trades coming to a maintenance event, and ensuring they are properly tooled,” Jeff says.

“Once the event is planned and we work out the equipment and consumables needed, including types and quantities, we deliver and manage that equipment on site, including the quality assurance, safety checks and certifications.

“We also provide mechanics and electricians to perform maintenance at site – not only on the Coates gear – but on the customer’s own diesel assets, light towers and so on. Additionally, we manage the reporting, which is imperative, because it moves into a feedback loop for the next event, where the client can achieve even greater efficiencies and savings.”



Case study:

Newcrest Mining

Major shutdown in PNG has golden outcome despite pandemic challenges

When Newcrest Mining Limited planned a maintenance shutdown at the Lihir gold mine in Papua New Guinea in May 2021, they faced an unprecedented challenge – a shortage of equipment and personnel due to the global pandemic. Instead of using an existing shared tool store, they engaged Coates Industrial Solutions to provide a fully staffed tool store solution.

Meticulous scoping and planning were required to support the six-week shutdown at the remote island site, 900kms from Port Moresby. The Coates tool store comprised consumables and small trackable equipment, such as hand tools, bolting and lifting equipment, to support a temporary workforce of over 1,800 people from 30 subcontractors.

Having understood previous challenges around stock control, Coates was able to track, manage and report tool usage through their proprietary asset management system and

achieved less than 1% tool loss, which helped reduce overall costs. Coates also provided valuable reporting data on customer-supplied assets to provide a complete picture and inform the planning of future maintenance events.

“I’ve had nothing but positive feedback from the Lihir team on the support Coates offered during this event,” says Anthony Paskin, Shutdown Logistics Senior Planner at Newcrest Mining. “We were particularly impressed with the stock control and reporting systems, and with the way the Coates crew stepped up to assist us in delivering this event during a very tight timeframe.”⁸

Achieved
<1%
Tool loss



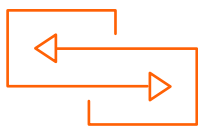
3. Smarter asset management



Tools, equipment and consumables form a large part of any planned maintenance budget, so being able to readily access them, and understanding how, when and where they are being used during maintenance works, is essential. Many sites operate a central tool store for trades and maintenance personnel, yet issues such as lost or damaged tools, poor inventory management and equipment wastage mean they can be a source of inefficiency. There are also more serious implications at play, particularly around safety and compliance.

Coates provides multiple tool store options that are staffed by experienced personnel and powered with SitelQ, the company's next-generation asset management solution for hired and customer-owned tools, equipment and consumables.

"We've collaborated with our clients for decades using our proprietary CHASE asset management system and have drawn on this experience to develop SitelQ," Jeff explains. "The cloud-based, real-time asset management solution means management can access data and analytics from anywhere, 24/7."



SitelQ captures
every
transaction

SitelQ's primary features include a custom-designed scanning application for convenient checkout and return of tools, equipment and consumables, along with utilisation reporting by trades, tooling groups, personnel and contractors.

"This helps bring a culture of accountability to a site. As opposed to paper-based tracking systems which might capture about 10% of transactions, this system captures every transaction," says Jeff. "We have an accurate record of when a tool was issued and to whom, so if a tool goes missing, we know who to ask."

Importantly, SitelQ manages Verification of Competency (VOC), ensuring the right tools and equipment are seamlessly matched with competent and approved personnel.

"From a safety perspective, this is key, especially with so many subcontractors on site during a shutdown," he stresses. "In conjunction with the tool store, or permit hut, SitelQ tracks and manages all tickets and licences. We can ensure the tools are issued to the correct personnel, thus meeting WHS requirements."

Reports generated by SitelQ are also instrumental to improving processes for current and future maintenance shutdowns.

"The information we get from the reports about the tools is invaluable in terms of drilling down on inefficiencies," adds Jeff. "From identifying tool wastage to analysing equipment utilisation, the reporting maximises efficiencies moving forward. We know what's been certified for compliance, what's got to be replenished and what consumables need to be purchased for the next maintenance event."



Case study:

EnergyAustralia

Improved tool time efficiency at Mount Piper power station outage

Coates has been instrumental in ensuring the success of a major plant upgrade at EnergyAustralia's Mount Piper power station near Lithgow, New South Wales. This huge project – one of the biggest maintenance events in the history of the 26-year-old station – will ensure 55,000 more homes are powered without burning coal.

Phase 1 of the upgrade saw one 700MW turbine taken offline in 2020, while the second remained operational. Coates was engaged to deliver an on-site tool store to manage tooling and equipment hire, as well as customer-owned consumables, and provided large equipment, including boom lifts, scissor lifts, telehandlers, forklifts, generators, compressors, and temporary site accommodation.

The primary challenge was to coordinate the tooling needs of around 1,000 extra contractors to site each day, amid

Improved tool time efficiency



COVID-19 restrictions and increased safety protocols. Coates operated the tool store 24/7 to meet demand, and all hired tools and equipment – plus the customer-owned consumables – were managed via Coates Industrial Solutions' management system.

EnergyAustralia received daily reports on costings, as well as lost and damaged items at the project's completion. The data showed that Coates was able to improve tool time efficiency by 80%. Additionally, this data informed the scoping and planning of Phase 2, which Coates has been engaged to support in 2022, resulting in further efficiencies.

"With the data that the Coates team bring to site, we'll be able to prepare and know exactly what we need before it becomes a challenge," says Shane Lee, Resource Administrator at EnergyAustralia.⁹



4. Harness data and analytics



The need to improve operational efficiencies during shutdowns and maintenance means heavy industry is under pressure to do more work with less hired tools and equipment. To achieve this, companies need to know where their rented assets are and whether they are being used effectively enough to justify the cost.

Workforce productivity is just as important. Time spent looking and waiting for tools and equipment, or in non-productive or restricted areas of a job site, can have a huge impact on the delivery, profitability and safety of a maintenance event.

Internet of Things (IoT) solutions enable companies to analyse data from sensors on tools, equipment and even personnel to make more informed decisions.

To complement SitelQ, Coates has invested – and continues to invest – in a range of smart technologies that take advantage of IoT connectivity, including a universal telemetry solution. Custom-designed telemetry devices, or those already fitted to equipment by the Original Equipment Manufacturer (OEM), collect asset location and utilisation data, which feeds into the Coates Connect customer portal where it can be analysed.

Harnessing these analytics can make a significant difference to the productivity and efficiency of a major maintenance

event, especially when coupled with Coates' proprietary Smart Site technology. Smart Site enables productive and non-productive geozones to be created, whereby any tagged tools and equipment in that location can be located, tracked and studied. Real-time data can also be collected from personnel wearing a smart badge.

“Telemetry and Smart Site take asset management a step further,” says Jeff. “For example, by using time-and-motion studies to monitor a percentage of the workforce – randomly and anonymously to protect employee privacy – Smart Site can identify where work and tool time inefficiencies are.”

In one example, Coates was able to identify a bottleneck around a permit hut on a customer's site.

“This is a great example of how this technology can bring immediate benefit during a maintenance shutdown. By using a combination of telemetry and Smart Site, we were able to see that personnel were being held up at the permit hut on site for lengthy time periods,” says Jeff. “The customer could then take action – such as putting on another staff member at the permit hut – to prevent the bottleneck.”

In another example with a mining and refinery customer, Coates was able to reduce the customer's monthly equipment hire spend by 9.1% via a managed telemetry solution, which included a dedicated data analyst¹⁰.

“By analysing the raw equipment data from telemetry devices, we were able to identify and off-hire equipment that was sitting idle and prevent unnecessary hires,” Jeff explains. “This resulted in an overall reduction in hire equipment costs, as well as more efficient use of equipment on site, which in turn, encouraged better hire behaviour across the site.”



5. Embrace drone technology



Infrastructure assets in the heavy industry sector are often large, remote, at height, or in hazardous or confined spaces, making it costly and time-consuming to inspect and assess their maintenance needs. Manual inspections typically involve rope teams and equipment such as scaffolding and elevated work platforms, which present significant safety risks for personnel.

Drone technology is transforming asset maintenance. From a safety perspective, drones take workers out of dangerous situations. Operated by a single pilot, they provide a faster and more cost-effective way to inspect assets, often with less asset downtime. Drone captured high-resolution imagery and 3D models, or digital twins, can be used to review assets online, plan maintenance collaboratively with teams in any location and monitor asset conditions over time.

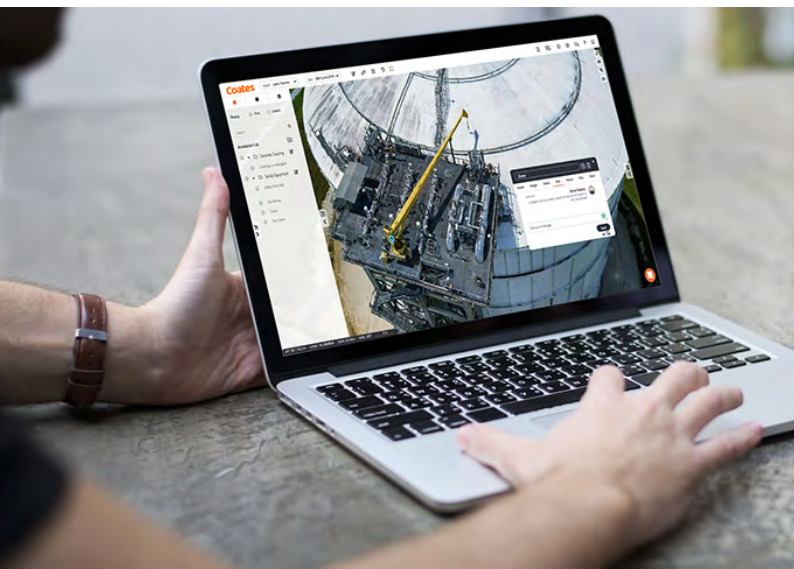
“Simply put, drones are safer, faster and cheaper,” says Jeff. “With 3D drone technology you have global visibility of an asset right down to the millimetre – the detail is phenomenal. An engineer on the other side of the world has the ability to scroll around a 360-degree view of an asset and attach processes to any findings or required maintenance actions, such as pinning a welding spec onto the 3D model exactly where the welding repair needs to take place.”



Jeff cites an example with a customer where drones were deployed to a remote mine site to inspect elevated conveyors prior to a maintenance shutdown.

“Not only were we able to identify pockets of work that needed to take place, but we could also see that debris had fallen off the conveyors and was sitting on the girders – this could easily have blown off in the next major storm and caused a serious injury,” he recalls. “The drone inspection meant the client was able to act quickly and remove the hazard.”

Alongside access to qualified drone pilots and an intuitive online platform, Coates’ drone service includes Civil Aviation Authority approval, Safe Work Method Statement (SWMS) and Job Safety Analysis (JSA) documentation.



Benefits of using drones for maintenance events

- Safer for your workforce
- Faster than manual inspections
- More cost-effective
- Reduced asset downtime
- More accurate data collection
- 24/7, global visibility of 3D models
- Cost savings from proactive monitoring



6. Upskill the workforce



With a huge number of contractors on site during a maintenance project, and regular personnel performing non-routine tasks using specialised or unfamiliar equipment, often in confined or hazardous environments, workforce safety is critical. Businesses in the heavy industry sector must ensure all staff have access to the right tools and equipment and are trained to use them competently.

As a Registered Training Organisation (RTO) since 1996, Coates is well-positioned to help heavy industry fill an otherwise widening skills gap. The industrial solutions provider offers more than 80 nationally recognised Units of Competency registered by the Australian Skills Quality Authority and over 70 VOC options, including High Risk Work (HRW) licences.

The company is recognised as one of the leading training providers in the country, exceeding the national benchmark

for quality training indicators according to National Centre for Vocational Education Research (NCVER) data¹¹.

“We provide training courses on hundreds of pieces of kit and operations, such as confined space work, and operating forklifts and elevated work platforms,” Jeff explains. “We also offer training on how to use specific tools on the job, for example, how to use a torque wrench, along with bespoke and contextualised courseware to suit customer-specific needs, policies and procedures so that it’s completely relevant to their workforce and environments.”

Training can be delivered at customer sites anywhere in Australia, seven days a week, including night shifts if required, or at suitable Coates branches across Australia. “Having this RTO capability is another example of how Coates provides a turnkey, end-to-end service that ultimately assists industrial customers address the resource challenge,” Jeff says.



In summary

To ensure profitability and safety in a planned maintenance shutdown, heavy industry operations need to mine for efficiencies and cost savings that can be found in industrial solutions. How can businesses achieve this while facing a significant resource challenge? By engaging an end-to-end partner with the experience and practical know-how to scope and plan these events successfully. By leveraging smart technologies, such as drones, telemetry, SitelQ and Smart Site, to provide data-driven insights that can be used for current and future events. And by upskilling subcontractors and maintenance personnel to safely perform specific and high risk work with a Registered

Training Organisation.

“Industrial solutions are not limited to tooling and equipment, they’re holistic. Our knowledge of best practices enables us to leverage efficiencies, and we can bring tremendous value to a maintenance event by sharing our expertise and learnings from more than 135 years’ experience in the heavy industry space,” concludes Jeff. “There’s a reason a lot of our customers are repeat customers, because they know that when it comes to tooling, equipment, consumables, technology, training and all the peripheral services involved in a maintenance event or project, Coates is a trusted partner they can rely on.”



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References

1. Heavy Industry Low-carbon Transition: www.hiltcrc.com.au
2. Australian Infrastructure Audit 2019, https://www.infrastructureaustralia.gov.au/sites/default/files/2019-08/industry_efficiency_capacity_and_capability_-_2019_australian_infrastructure_audit.pdf
3. Infrastructure Market Capacity Report 2021 https://www.infrastructureaustralia.gov.au/sites/default/files/2021-10/Infrastructure%20Market%20Capacity%20Report%2020211013_0.pdf
4. Resources industry digs up export record, Australian Mining, August 2021 <https://www.australianmining.com.au/news/resources-industry-digs-up-export-record/>
5. The raw materials challenge: How the metals and mining sector will be at the core of enabling the energy transition, McKinsey & Company, January 2022 <https://www.mckinsey.com/industries/metals-and-mining/our-insights/the-raw-materials-challenge-how-the-metals-and-mining-sector-will-be-at-the-core-of-enabling-the-energy-transition>
6. No silver bullet for skills shortages, EY, October 2021, https://www.ey.com/en_au/economics/no-silver-bullet-for-skill-shortages
7. Labour Hire in Key Sectors, Labour Hire & Contracting Across the ASX100, ACCR, May 2020 <https://www.accr.org.au/research/labour-hire-contracting-across-the-asx100/labour-hire-in-key-sectors/>
8. Managed tool store optimises delivery of gold mine shutdown, Coates <https://www.coates.com.au/newcrest-mining-shutdown>
9. Supporting an outage at Mt Piper, Coates <https://www.coates.com.au/supporting-an-outage-at-mt-piper>
10. IoT-enabled telemetry solution, Coates post: https://www.linkedin.com/posts/coatesau_?trk=public_post
11. NCVET 2021, VET student outcomes 2020, NCVET, Adelaide, <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/vet-student-outcomes-2021>