The future of work in mining

What will jobs look like in intelligent mining operations?

Intelligent asset care lead

Leads plant and machinery maintenance activities based on the asset maintenance strategy; performs analysis on asset, process, and ERP data to develop actionable insights, improving asset reliability and extending asset life

INTELLIGENT ASSET CARE LEAD

Summary

The intelligent asset care lead is critical in identifying and executing predictive maintenance on fixed and mobile assets. They are able to analyze a rich data set to gain critical asset insights, predict asset behavior, and ensure they are delivering the right maintenance activity in line with the relevant asset strategy.

Intelligent asset care lead team members have access to the full suite of static (e.g., oil, thermo, vibro, physical inspections) and dynamic (sensor, ERP) data sources. The insights based on algorithms driven by these data points are delivered to mobile and wearable devices, which facilitate condition-based asset monitoring and maintain asset health.

Responsibilities

- Where possible, program and supervise automation of maintenance assist devices to complete repairs and maintenance

- Lead and monitor technical maintenance work based on work orders (WO) raised in the ERP system

- Complete real-time monitoring and data analysis to assess asset performance and identify any proactive actions if current or predicted issues are identified

- Interpret machine diagnostic data, conduct problem analysis to understand critical equipment shortfalls, and develop optimized solutions to eliminate root causes

- Build, develop, and adjust equipment maintenance strategies and perform equipment strategy reviews and failure analysis to ensure that all task lists and work instructions remain accurate and relevant

- Develop intelligent asset strategies that drive the right equipment maintenance strategies

- Build libraries of algorithms that enable functions to predict behaviors/failure modes; this is done over time through access to a richer data set and working with the Nerve Center data scientist

- Collaborate globally across mine sites to ensure that internal learnings and algorithms are communicated and applied across the portfolio to prevent duplication of effort in problem-solving

- Collaborate with other mine sites through the OEM to ensure better equipment design and support from the manufacturer; this allows for benchmarking of equipment performance and health

- Monitor carbon emissions of assets to align operations with the mine's carbon footprint goals

- Track energy demand and demand trends of assets through the Nerve Center

Time spent on activities

- ■ Predictive maintenance ■ Real-time monitoring ■ Asset maintenance
- ■ Review and update asset maintenance strategy, models, rules, and policies ■ Problem analysis

| 33% | 25% | 20% | 12% | 10% |

MEGAN FELDMAN

INTELLIGENT ASSET CARE LEAD
Mining Inc.

Megan is a proactive and outgoing individual. She thinks logically and is a strong believer in data-driven maintenance. She enjoys debating with her colleagues on the use of different data sources to predict asset failures and minimize downtime of operations. Megan's father was a tractor mechanic who has passed down his love of getting his hands dirty working with large machinery to his daughter.

Experience

Intelligent maintenance lead
Mining Inc. | *Aug 2022–present*
Works within the maintenance team, performing data analysis to predict asset failure, programming equipment, and completing maintenance of assets when required

Reliability engineer
Mining Inc. | *Jun 2020–Jun 2022*
Identified and managed asset reliability risks that could adversely affect plant operations; identified and reviewed critical equipment; performed effective failure reporting and closely tracked recommendations

Apprentice
Mining Inc. | *Jun 2016–Jun 2020*
Apprenticed with the maintenance execution team and completed maintenance work under supervision; completed a trade and data analytics foundation certificate as part of the apprenticeship.

Education

- Mechanical trade certificate
- Data analytics foundational certificate/diploma
- Programming foundations certificate

Toolbox

Asset Performance Dashboard
A visual display that presents data, live information, and analysis via the Nerve Center from multiple sources to facilitate informed decision-making

Smart HUD
Smart augmented reality glasses that provide data directly to the maintenance execution employee to ensure they complete the right actions when working on the asset

Robo Diagnostic & Repair
Diagnostic app and suite of programmable robotic equipment that assess data and complete repair with minimal human intervention

Skills and endorsements
HUMAN

Equipment maintenance · 519
Endorsed by **Bernard** and **Debra**, who are highly skilled at this

Complex problem-solving · 363
Endorsed by **Khanyisile**, who is highly skilled at this

Troubleshooting · 288
Endorsed by **John**, who is highly skilled at this

Organizing, planning, and prioritizing work · 416
Endorsed by **Talitha**, who is highly skilled at this

Operations analysis · 369
Endorsed by **Charl**, who is highly skilled at this

Asset maintenance strategy · 420
Endorsed by **Amos** and **Fred**, who are highly skilled at this

TECH

Programming · 253
Endorsed by **Lia** and **Japhta**, who are highly skilled at this

Digital fluency · 520
Endorsed by **Luke**, who is highly skilled at this

Data analytics · 286
Endorsed by **Richard**, who is highly skilled at this

Robotics · 365
Endorsed by **Andrea** and **Nasreen**, who are highly skilled at this

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A DAY IN THE LIFE

06:00 AM — Starts her day with a black coffee and logs into the Asset Performance Dashboard on the Nerve Center from her tablet to review any urgent matters that may have occurred overnight

06:30 AM — Amends the digital job list and sends it out based on her analysis of the last shift, production priorities, and high-priority orders

08:00 AM — Confirms that WOs have been completed as she can see attendance at RFID at equipment

11:00 AM — Is notified about a safety alert, which she forwards to her team to review via the Robo Diagnostic tool; receives a notification that it has been actioned

01:00 PM — Is notified about a pipe breakdown. Approves spares to be released from the stores at the request of one of her maintainers

02:00 PM — Raises a breakdown WO and allocates it to a team member. Then jumps in her LV and completes her vehicle prestart check using her mobile, and drives to the digger to walk through the task with the team

03:00 PM — Accesses the reliability compass and watchlist to check on asset health information to support the breakdown work and consider future improvements

04:30 PM — Along with her maintainer, contacts the SME at a remote location to discuss the pipe repair. With the use of Smart HUD, they share live footage to show the SME the broken equipment

05:00 PM — Spends some time reviewing the progress of current maintenance orders and her production targets using the KPIs preset on her dashboard—these are updated in near real time as the team complete their WOs

05:30 PM — Reallocates resources from a job ahead of schedule to one lagging behind, to benefit the production

05:40 PM — Meets with the team to discuss priorities for the night shift, including discussing updates on alerts and action required

06:10 PM — Heads home for the night

About the authors

ANDREW SWART Andrew Swart is both the global and Canadian leader of the Mining & Metals practice as well as the global leader for the sector. In his global roles, Swart leads a team from around the world and sets the strategic direction and go-to-market strategy for the global practice. With 20 years of industry and consulting experience, he is passionate about client service, having worked across many major mining and metals geographies, including Canada, Chile, Russia, Ukraine, Kazakhstan, Brazil, Germany, India, South Africa, the United Kingdom, and the United States. Swart's areas of expertise include corporate and competitive strategy engagements, digital and innovation systems, and large organizational transformation programs.

JANINE NEL Janine Nel is Deloitte's global Future of Work leader for Energy, Resources & Industrials, and Deloitte's global colead for the People & Diversity pillar of the mining and metals group. Leading delivery and thought leadership in the area of digital and its impact on work, Nel focuses on the workforce and the workplace in the future of work. She helps clients unpack the elements of work that are truly human, what can be done by machines, and what this means for people. She is also part of an effort that pioneers the people impacts of the mine of the future.

TALITHA MULLER Talitha Muller is the Future of Work program manager for Deloitte Africa and a member of the Global Future of Work Regional Leadership forum. Muller plays an integral part in leading the Future of Work movement within South Africa by providing strategic guidance to business leaders on navigating the complexity of digital disruptions pertaining to changes in work, workforce, and workplace, and how to create exponential professionals.

JENNA WING As an industrial psychologist with two years' experience within the energy and resources industry, Jenna Wing has worked with the Future of Work team on developing the digital nerve center solutions for the intelligent mine. She focuses on the future of the workforce, the change in skills and capabilities, how roles will be deconstructed, and the business case for reskilling/repurposing people. Through creative ways of working and learning, Wing wants to continue to be a part of, and build, high-performing teams by challenging everything we do from a personal, work, and mindset perspective.

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