

Data Science Career Track

Monalco Mining | Problem Statement

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PROBLEM STATEMENT:

What opportunities exist for Monalco Mining to reduce maintenance costs by 20% by reducing production time of machines to align with manufacturer recommendations, limiting excess wear requests, or reorganizing maintenance practices/training?

Component	Information
Context	Monalco Mining, one of the world's largest iron ore mining companies in the world, has offices across the globe. Monalco's exploration efforts identified significant iron resources in Bass-Shingle Basin in Western Australia. Monalco, along with many other mining organizations, has invested heavily in operating technologies such as ore-crushers and has spent <i>significant amounts of money into maintenance</i> to maximize production of iron ore. Work orders indicate the company spent \$30M for 2018 on ore crusher maintenance with a forecast of \$45M for 2019. Reportedly, 80% of work requests are due to 'excess wear' . The minimum amount of maintenance events allowable is one event at every 50,000 tons of iron ore produced.
Success Criteria	Shaving 20% worth of costs over the year is sufficient to weather future downward shifts in pricing.
Scope of the solution	In response to worsening market conditions, management decided to focus on streamlining costs, especially in maintenance expenditure to limit the impact this has on profitability.

Constraints	<p>The company is already close to its operating break even (\$50/ton) at \$55/ton. Investing in additional ore-crushers to maintain production levels, while not exceeding manufacturer's recommended work time is likely not possible. As Chris mentioned, "we are going to need to exhibit spending discipline and reduce operating costs until they are back to acceptable levels."</p>
Stakeholders	<p>Chanel Adams – Reliability Engineer, Jonas Richards – Asset Integrity Manager, Bruce Banner – Maintenance SME, Jane Steere - Principal Maintenance, Fargo Williams – Change Manager, Tara Starr - Maintenance SME</p>
Key Data Sources	<ol style="list-style-type: none"> 1. Data Historian - This includes information on how many tonnes of Iron Ore we have processed with the ore crushers. 2. Ellipse - This includes information on the old work orders that used to be raised for our equipment, before our upgrade to SAP. 3. SAP - This is the most up-to-date information source on our equipment logs and work order requests that have been raised for 4. T3000 DCS – Sends raw streaming data on vibrations, temperature, and the humidity of the ore crushed to Data Historian 5. Ore Crusher System - This includes a high-level process map outlining how the Ore Crusher System works for individual ore crusher models.