Problem Statement Worksheet (Hypothesis Formation)

What opportunities exist for Monalco to reduce annual maintenance expenses by $6M in 2019, through the reduction of excess wear and maintenance events which drive up equipment maintenance costs.

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1 Context

Monalco Mining is one of the world's large iron ore mining companies and has discovered major iron resources in Western Australia. Monalco heavily invested in processing equipment during a significant world iron price increase, but prices have since dropped. In order to safeguard profitability, management has decided to investigate costs, particularly maintenance expenditures.

2 Criteria for success

Maintenance costs will be reduced by 20% of the $30M spent in 2018, for a total of $6M, while maintaining operational availability of all equipment to continue production.

3 Scope of solution space

Identify savings for maintenance expenditure only, and assuming prices will remain low at $55/ton (no ability to grow revenue to get out of the problem).

4 Constraints within solution space

- **Price constraint of a break-even of $50/ton.**
- **Necessity of maintenance event every 50,000 tons of iron ore processed.**
- **Requirement to respond to work requests as needed.**

5 Stakeholders to provide key insight

- **Chris Hui – Team Lead, insights and Analytics Team**
- **Hanel Adams – Reliability Engineer**
- **Jonas Richards – Asset Integrity Manager**
- **Bruce Banner – Maintenance SME**
- **Jane Steer – Principal Maintenance**
- **Fargo Williams – Change Manager**
- **Tara Starr – Maintenance SME**

6 Key data sources

- **Data Historian: iron ore processing data**
- **Ellipse DB: Historical Work Order info (prior to SAP Upgrade)**
- **SAP: Current data on equipment logs and work orders**
- **T3000 DCS: Data on ore parameters, such as vibrations, temperature and humidity (this data source may identify work order drivers)**