

# Case Study: Cliffs Natural Resources

## Koolyanobbing Alliance, WA Australia

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### Key Results

- Overall utilization from 82 to 89%
- Asset availability from 89 to 92%
- Asset utilization from 92 to 97%
- Throughput from 7.6 to 8.8 MTPA
- Shutdown overruns from 238 to less than 10 min.
- Haulage losses reduced by 6%.
- ROM losses down 97%
- Oversize losses down 57%
- Choking losses down 89%
- Over A\$4M in tangible benefits
- Stock reduced by 41% in OHP.
- Additional A\$2.5M of benefits identified.



*"I am pleased to report that the project has been very successful and I believe that Renoir played a significant part in the organization achieving a record production year and establishing a solid platform for Business Improvement in the future."*

Colin Williams  
Chief Operating Officer  
Asia Pacific Iron Ore

*The Koolyanobbing Iron Ore Operations is an Alliance between Cliffs NR and BGC Contracting, located 420km East of Perth WA. Due to an expansion in the rail network capacity, the organisation needed to increase the throughput of the Ore Handling Plant (OHP) by 16% whilst reducing costs by 5% without any significant capital investment.*

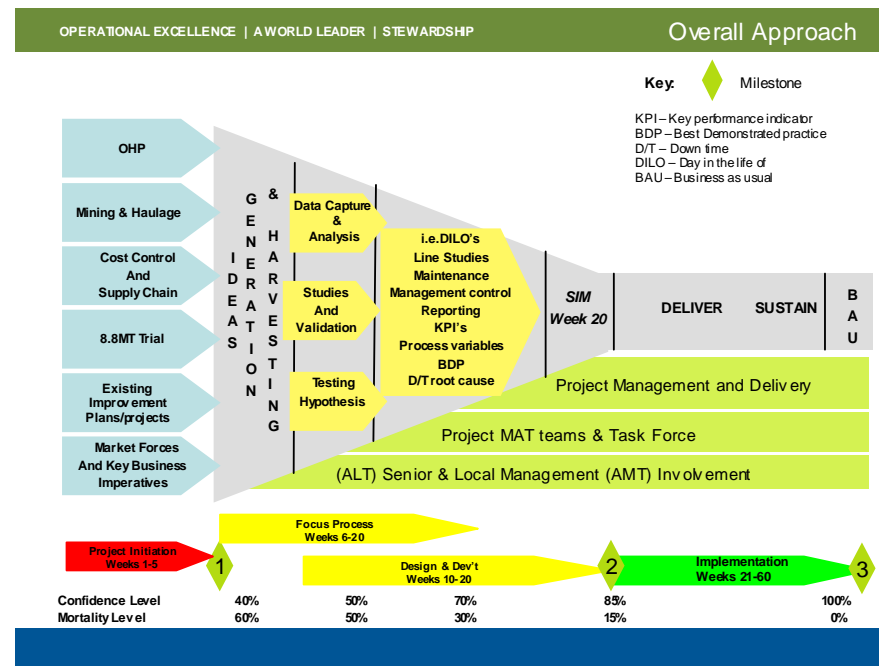
### THE ASSESSMENT

A three week Analysis at the mines and in Perth resulted in a 60 week project. From the initial Analysis studies, the objectives of the leadership team (16% OHP throughput improvement) were proved viable and the 8.8 million tonne per annum (Mtpa) project was launched.

### PROJECT & FOCUS PROCESS™ APPROACH

A core client team was selected and trained. The Team included three Management Action Teams (MATs), a dedicated full time task force of three from Cliffs and four full time Renoir consultants. Renoir's Focus Process™ over the first 20 weeks concentrated on the development and ratification of the benefits as well as designing the processes and systems required. The MATs were formed as cross functional teams, having the core responsibility for opportunity identification, savings assessment, performance management and delivery. These teams were dedicated to Ore Processing, Mining & Haulage, and Cost Control & Supply Chain.

*This figure illustrates how these efforts were combined with existing initiatives.*



## Ore Handling Plant (OHP)

**Guiding Principle:** Productivity and throughput improvements to enable the plant to produce 8.8 Mtpa of Ore (fines and lump), matching the new rail capacity & without capital investment.

### Specific Approach:

Availability is directly linked to plant maintenance efficiency of operation. Up-graded planning and control elements were developed with standard BOM's, task durations and skills used to complete shutdown plans. This was linked to downtime recording and reviewed on an hourly basis, with root cause analysis for significant losses. Utilisation losses included no feed (ROM bin empty) metal trips, jaw chokes and bridges. These were all tackled separately using a range of techniques: process & organizational design changes, metal trip analyses, awareness training, revision of standard operating procedures & standardization across shifts.

#### Desired Outcomes:

- Improve Overall Asset Utilisation from 82%.
- Improve Asset Availability from 89%.
- Improve Asset Utilisation from 92%.
- Increase throughput from 7.6 Mtpa base.
- Reduce shutdown overruns from 238 min.

#### Actual Outcomes

- Increased overall utilization to 89%
- Increased asset availability to 92%
- Increased utilization to 97%
- Increased throughput to 8.8 MTPA
- Reduced shutdown overruns to less than 10 min.

## Mining & Haulage

**Guiding Principle:** Provide an increased, consistent, reliable and effective supply of raw material for ore processing (OHP).

### Specific Approach:

As losses in this area directly impact the performance of ore processing & plant utilization, several approaches were taken: control & loss accounting processes were redesigned & upgraded along with RCA; organizational, process and metric changes were made; and management reporting systems and KPI's were upgraded as required.

#### Desired Outcomes:

- Reduce Haulage operational losses by 5%.
- Reduce ROM losses from 136 min per week.
- Reduce oversize losses from 74 min per week.
- Reduce Choking losses from 197 min per week.

#### Actual Outcomes:

- Haulage losses reduced by 6%.
- ROM losses down from 136 to 4 min/wk (-97%).
- Oversize losses from 74 to 32 min/wk (-57%).
- Choking losses from 197 to 21 min/wk (-89%).

## Cost Control & Supply Chain

**Guiding Principle:** Reduce costs through improved efficiencies, reduced waste, improved procurement, and inventory and vendor management.

### Specific Approach:

The Project supported the design and installation of the JDE inventory system for mobile plant and OHP stock control and procurement. The Business Improvement Process and Systems were re-designed to include charters, project management toolkit and evaluation methodology. The cost control system was designed and implemented to enable weekly proxy costs for haulage and processing and shift proxy costs for mining.

#### Desired Outcome:

- Deliver A\$4M in annualized benefits
- Improve selection & management of critical stock.

#### Actual Outcomes:

- Over A\$4M in tangible benefits delivered across the business including: tyres; training; explosives; drill suppliers; HME utilization; transportation; spares costs and process redesign to increase component life.
- Stock reduced by 41% in OHP.
- Additional A\$2.5M of benefits identified.
- Bottom up proxy costs from 7 weeks to 1 week.
- 2010 business improvement initiatives identified.

## Sustainability and Legacy

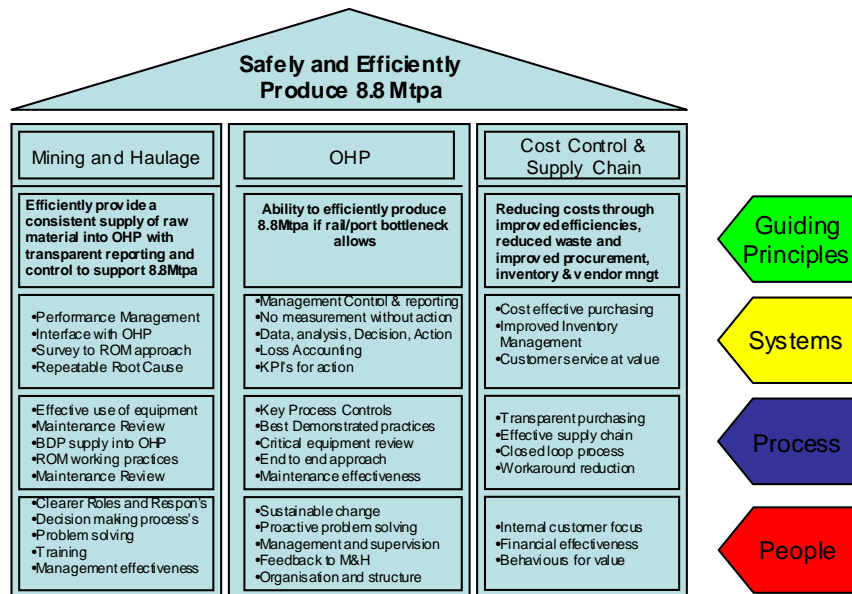
The true test of an effective change project is that it disappears to become business as usual. At Cliffs, skills and knowledge transfer have been achieved through the three task force members, MAT teams, plus the systems and measures that drive behaviour for results.

By definition this process is never finished, there is and always should be more to complete and a dissatisfaction with the current state.

By investing in their people, more opportunities have already been identified and these will go into the Business Improvement process for mobilization in the coming months.

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## Business Improvement Project Overview



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## THE RENOIR GROUP

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Australia, +61 2 8216 0901  
 Austria, +43 1227 87200  
 Brazil, +55 11 3521-7319  
 China, + 86 10 6599 7934  
 France, +33 1 55 68 12 66  
 Germany, +49 69677 33459  
 India, +91 22 670 78762  
 Indonesia, + 62 21 5290 9139  
 Malaysia, +603 216 84401  
 Mauritius, +230 203 6600

Oil & Gas Division-UK, +44 1224 626669  
 Oil & Gas Division-USA, +1 713 300 8949  
 Philippines, +632 849 3960  
 Russia, +7 905 2666 797  
 Switzerland, +41 22 819 9417  
 Thailand, +66 2 627 9368  
 United Arab Emirates, +971 2 406 9873  
 United Kingdom, +44 1865 481446  
 USA, +1 888 236 2945  
 Viet Nam, +84 43936 7905