BHP Billiton Iron Ore – Western Australia
Port & Rail Operations

Mick Evans – Vice President Port & Rail

Iron Ore
Continuous Improvement in Safety Performance

- Continued development of One Business approach to HSEC systems and processes.
- Focus areas:
  - Leadership
  - Behavioural based systems
- Programs & actions:
  - Take 5/JHA’s
  - Stop for safety
  - Risk assessments
  - Fit for work/life (fatigue management)
  - 15 HSEC Standards
- 40% reduction in TRIFR during FY06 – last quarter was a record low of 7.9.

Safety - 12 Month Rolling TRIFR

![Safety Chart](chart.png)

- Actual
- 2006 YTD
Summary

Port Operations:
- Final stage of production process;
- Crushing, screening & blending to create on-grade products;
- Nelson Point & Finucane Island.

Rail Operations:
- Service nine separate mine/loading facilities;
- Service two separate port facilities;
- Integrated system: mine/rail/port.
Railroad Overview
BHP Billiton Iron Ore Railroad

• Safety focused

• Highest axle loads in the world

• Emphasis on research

• History of innovation
Operating Improvements Have Increased Axle Loads

Axle Load

<table>
<thead>
<tr>
<th>Year</th>
<th>Max. Wet Tonnes per Wagon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>28.5t</td>
</tr>
<tr>
<td>1974</td>
<td>30.0t</td>
</tr>
<tr>
<td>1986</td>
<td>32.5t</td>
</tr>
<tr>
<td>1996</td>
<td>35.0t</td>
</tr>
<tr>
<td>99-04</td>
<td>37.5t</td>
</tr>
<tr>
<td>05-06</td>
<td>37.5t/40.0t</td>
</tr>
</tbody>
</table>
Employee Productivity Tripled in the Past 10 Years

Million Tonnes Railed Per Employee

<table>
<thead>
<tr>
<th>FY96</th>
<th>FY97</th>
<th>FY98</th>
<th>FY99</th>
<th>FY00</th>
<th>FY01</th>
<th>FY02</th>
<th>FY03</th>
<th>FY04</th>
<th>FY05</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.126</td>
<td>0.148</td>
<td>0.151</td>
<td>0.167</td>
<td>0.179</td>
<td>0.216</td>
<td>0.245</td>
<td>0.258</td>
<td>0.301</td>
<td>0.31</td>
</tr>
</tbody>
</table>
Increasing Operational Flexibility – Rail Sequencing Project

• Implemented in November 2005

• Sequentially-based dispatching method that allows trains to depart as soon as they are made up after dumping

• The sequence of destinations reflects the required blend ratio for the business (including satellite orebodies)

• Computer modeling indicated sequentially based dispatching increases productivity by around 3.5%

• Improvements have been consistently delivered around this mark
Environment & Efficiency Improvements

Contributing Factors

- Rail / Wheel profile
- Aerodynamic Ore Cars
- Efficient Locomotives
- Distributed Power
- Higher Axle Load
- Longer Trains
- Driver Strategy

Litres of diesel per wet tonne

<table>
<thead>
<tr>
<th>Year</th>
<th>Litres</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>1.45</td>
</tr>
<tr>
<td>2006*</td>
<td>0.72</td>
</tr>
</tbody>
</table>

* Q3 FY06
World’s Longest and Heaviest Train

- 682 wagons = 7.353 kms
- eight GE AC6000 locomotives
- 99,732 gross tonnes
- 82,262.5 tonnes of iron ore
- distributed power / 5 locations
- single driver
BHP Billiton Rail Lines - Among the Best in the World

### Track Productivity
**Gross Tonne Railed per Route Km**

<table>
<thead>
<tr>
<th></th>
<th>BHPB GJV</th>
<th>BHPB NJV</th>
<th>Coal Line</th>
<th>Brazil 1</th>
<th>Brazil 2</th>
<th>Sweden</th>
<th>Ore Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHPB GJV</td>
<td>63,593</td>
<td>200,283</td>
<td>192,095</td>
<td>83,402</td>
<td>140,338</td>
<td>70,408</td>
<td>43,466</td>
</tr>
</tbody>
</table>

### Locomotive Productivity
**Million Net Tonne-Kilometres / Loco / Year**

<table>
<thead>
<tr>
<th></th>
<th>BHPB GJV</th>
<th>BHPB NJV</th>
<th>Coal Line</th>
<th>Brazil 1</th>
<th>Brazil 2</th>
<th>Sweden</th>
<th>Ore Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHPB GJV</td>
<td>421</td>
<td>573</td>
<td>757</td>
<td>327</td>
<td>134</td>
<td>247</td>
<td></td>
</tr>
</tbody>
</table>

### Wagon Productivity
**Million Net Tonne-Kilometres / Wagon / Year**

<table>
<thead>
<tr>
<th></th>
<th>BHPB GJV</th>
<th>BHPB NJV</th>
<th>Coal Line</th>
<th>Brazil 1</th>
<th>Brazil 2</th>
<th>Sweden</th>
<th>Ore Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHPB GJV</td>
<td>5.96</td>
<td>11.26</td>
<td>11.57</td>
<td>6.27</td>
<td>4.35</td>
<td>7.84</td>
<td></td>
</tr>
</tbody>
</table>

### Labour Productivity (Including Contractors)
**Million Net Tonne-Kilometres / Person / Year**

<table>
<thead>
<tr>
<th></th>
<th>BHPB GJV</th>
<th>BHPB NJV</th>
<th>Coal Line</th>
<th>Brazil 1</th>
<th>Brazil 2</th>
<th>Sweden</th>
<th>Ore Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHPB GJV</td>
<td>39.10</td>
<td>76.90</td>
<td>13.70</td>
<td>18.20</td>
<td>10.30</td>
<td>7.30</td>
<td>23.60</td>
</tr>
</tbody>
</table>

Source: BHP Billiton, P.L. Ross Consultants Ltd
Current Train Operations

Newman Line

- Up to 14 trains per day to port & same back to mines (pass via sidings)
- Flexibility of one / two / three Rake Trains
- Train configuration:
  1 rake = 104 ore cars = 12,480 tonnes of ore
  2 rakes = 208 ore cars = 24,960 tonnes of ore
  3 rakes = 312 ore cars = 37,440 tonnes of ore

Goldsworthy Line

- 4 ore trains per day
- Train configuration:
  90 ore cars = 7,650 tonnes of ore
Operational Delays Flow Through Entire System

- Delay at Port Hedland
- Increased rail cycle time
- Less trains arrive at mines
- Full stockpiles
- Lower mine production

Xbar-R Chart of Dumper Effectiveness by Group

- X̄ = 21.41
- UCL = 23.35
- LCL = 19.47

Xbar – R Chart of Rake trip Time by Group

- X̄ = 21.41
- UCL = 23.35
- LCL = 19.47

Xbar-R Chart of NJV ROM Production (OFR)

- X̄ = 105028
- UCL = 126109
- LB = 85526
Infrastructure Access – Key Issue for Continued Growth

• The integrity of our rail network is vital to the efficient operation and expansion of one of the country’s leading export industries;

• Track access (ie: Part IIIA imposed) is inefficient due to:
  – Loss of operational flexibility
  – Decreased rail & system capacity
  – Delays to future expansions

• And will result in:
  – Very high access charges
  – Subsidies from BHP Billiton
  – Reduced investment incentives

• Better solutions exist (safer & far more efficient):
  – Haulage agreements (ie: State Based RTA)
  – Mine gate sales

• We strongly believe in our position and will continue to vigorously defend it.
Port Hedland

Nelson Point

Finucane Island
Port Operations Overview

- Nelson Point & Finucane Island
- 365 days per year operation
- Crushing, screening & blending
- Plan is for four ports (2 x Nelson Point and 2 x Finucane Island) with stockyard dedicated to each
  - Average maximum sailing draft (MSD) 17.94m
- A dynamic underkeel clearance program (DUKC) is utilised to calculate vessel maximum sailing draughts
- Port is serviced by 7 tugs (5 X 50 tonne & 2 X 65 bollard pull)
Typical stockpile cross-section, showing the chevron ply pattern. Taking a cross-section when the stockpile is reclaimed yields a composition that is close to the average for the whole stockpile.

Stockpiling – Key to On-Grade Production

- Stockpiles are blended (homogenised) as they are built – ‘Chevron Ply’ stacking
- Homogenising ensures grade deviations are decreased, compared to original ore stream
- Crucial to producing on-grade products
Demand for Products is Dynamic...

Demand Variability by Product
Weekly values and 4 weekly moving averages of vessel arrivals
...and Has Always Been

Demand Variability

Weekly values, 4 weekly and 6 monthly moving averages of sum of all products on vessel arrivals
Port Hedland Shipping

- Entry to port by inwards route located to the East of main channel
- Exit from port by 43kms marked dredged channel
- Parameters affecting vessel movements:
  - Under keel clearance
  - Vessel handling
  - Tides
- Target gross loading rate 5,850 tph
- Target turn around time 85 hours
Port Hedland Channel Overview
Vessel Movements - Limited Windows of Opportunity

**Sunday 28 September 2003**

**Predicted Tides & Ranges**

<table>
<thead>
<tr>
<th>Time</th>
<th>m</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>00:33</td>
<td>7.44</td>
</tr>
<tr>
<td>High</td>
<td>12:24</td>
<td>7.17</td>
</tr>
<tr>
<td>Low</td>
<td>06:06</td>
<td>0.51</td>
</tr>
<tr>
<td>High</td>
<td>18:18</td>
<td>6.49</td>
</tr>
<tr>
<td>Low</td>
<td>06:15</td>
<td>0.51</td>
</tr>
<tr>
<td>High</td>
<td>18:18</td>
<td>6.49</td>
</tr>
</tbody>
</table>

**Times of Sun Rise & Set**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Twilight</td>
<td>05:29</td>
</tr>
<tr>
<td>Sunrise</td>
<td>05:51</td>
</tr>
<tr>
<td>Sunset</td>
<td>18:00</td>
</tr>
<tr>
<td>Twilight</td>
<td>18:25</td>
</tr>
<tr>
<td>Civil</td>
<td>05:51</td>
</tr>
<tr>
<td>Nautical</td>
<td></td>
</tr>
<tr>
<td>Astronomical</td>
<td></td>
</tr>
</tbody>
</table>

**DUK C Predictions Due:**
- 01:03hr
- 13:24hr
- 01:33hr 29/9

**Nelson Point and Finucane Island Berths**

- 1800000
- 1200000
- 600000
- 200000
- 100000
- 50000
- 20000
- 10000
- 5000

**General**

- Vessels over 325m LOA are daylight restricted. Sunrise 05:51hr, Sunset 18:00hr
- Vessels over 280m LOA require a suitable bridgefront compass, or be daylight restricted.
- Vessels with poor handling characteristics may be daylight restricted.

ALL departures are subject to DUKC requirements.

Vessels less than 280m LOA may depart on the flood tide.

Vessels less than 280m LOA and less than 80,000 DWT (two tug vessels) may depart at any time.
Developing Partnerships to Enhance Port Hedland

• Expect to invest more than A$100 million in the Pilbara over next decade – based on internationally recognised social research

• Service Delivery:
  – Developed MOUs with WA Government to address service issues (>A$12 million)

• Local Infrastructure:
  – Greening & cultural/tourism developments
  – A$3 million to improve local infrastructure, ie: playgrounds, parks, footpaths, etc (in addition to A$4.5 million for coastal upgrades)

• Alternative Economic Development & Capacity Building:
  – Indigenous arts skills program – developing retail businesses and export opportunities
  – Curtin University campus in Port Hedland
The End Product

225,000 tonne ore carrier leaving Port Hedland