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• Highlights of Newcastle Works
About Newcastle Works
ArcelorMittal South Africa

- Vanderbijlpark plant – 4.5 Mtpa Crude Steel Capacity
- Saldanha Steel – 1.2 Mtpa Crude Steel Capacity
- Newcastle plant – 1.9 Mtpa Crude Steel Capacity
- Vereeniging plant – 0.4 Mtpa Crude Steel Capacity
Brief History

- Newcastle Works
- Originally part of a government run organisation (ISCOR).
- The then government chose to build a plant in Newcastle to promote industrialisation in the area and optimise use of nearby resources and ports.
- Designs began in 1969 and the plant began its full production in November 1976.

- Liquid Steel Production (‘000 tons) 1 064 (1 563)
- Sales tons (‘000 tons) 1 039 (1 490)
- Percentage Domestic Sales 74% (54%)
- Manpower 1 715 (1 740)
- Area of Site 1 697 ha
- Perimeter 18.97 km
- Rail Networks 90 km
- Electricity consumption 1 752 Mwh/day (1 688)
- Primary Raw Materials received 7 086 t/day (7 874)
- Water Consumption 16 284 KLtrs/day (17 963)
**Monthly Follow-up Chart: 2012**

### KPI

**KPI Number**: 7176

**KPI Description**: NEW-SHRQ Combined Injuries (LTI & RWDC)

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<th>Forecast</th>
<th>Budget</th>
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**Month Remark:**

**Forecast Remark:**

**Responsible Person**: Gouws, Samantha
KPI Number: 6486
KPI Description: NC-LTIFR (Cum) Newcastle
Unit: LTIFR

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Month Remark: May
Forecast Remark: May

Responsible Person: Gouws, Samantha
• Safety:
  • Best ever LTIFR of 0.94 achieved in 2011 and 0.79 YTD.
  • Record run of 3.69 million man-hours (126 days) worked without an LTI during 2010.
  • Achieved a Level 5 rating for all ten ArcelorMittal Fatality Prevention Standards during June 2011 (first site in the global ArcelorMittal Group).
  • Training resources increased significantly to support Safety Program.
  • Completed major Blast Furnace repair project during H2 2011 without a serious injury.

• Health & Wellness:
  • Risk-based occupational health surveillance program well established.
  • Employee Wellness Program provides screening and counseling support for a range of lifestyle illnesses.
    • Voluntary HIV Counseling & Testing of employees and contractors.
  • HIV Support
    • Screening, counseling and tracking of BMI, raised cholesterol, hypertension and raised blood glucose.

• Occupational Hygiene:
  • Occupational Hygiene monitoring program in place to identify and manage occupational health risks relating to noise, heat, hazardous substances (including dust etc.), illumination, ergonomics and indoor air quality.
  • Identified risks are used as inputs to the occupational health surveillance program.
SHRQ

**Management Systems:**
- ISO 9001:2008 certification - Quality Management System
- ISO 14001:2005 certification - Environmental Management System
- OHSAS 18001: 2007 certification - Occupational Health & Safety Management System

**Risk Management:**
- Comprehensive risk assessment and management process in place.
- Process fully integrated with all other ArcelorMittal South Africa sites.
- External, international risk auditors are used to support the process from the risk identification phase, and where required, right through to the installation of mitigation measures.
FOCUS POINTS:
• Zero Effluent Discharge (ZED) implementation.
• Water use license amendment
• Closure and capping of historical disposal facility
• Historical pollution rehabilitation.
• Implementation of a Strategy for the containment and treatment of storm water.

HOLISTIC ENVIRONMENTAL MANAGEMENT:

• Development of Air Quality Strategy to strive towards compliance with New Air Quality Act.
Capex spent on Environmental projects to date

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<td>1998 – 2001</td>
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<td>Old Waste Site cut-off trenches</td>
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<td>2003 &amp; 2010</td>
<td>New waste site &amp; phase 2</td>
<td>R49m</td>
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<td>2003 - 2008</td>
<td>Water strategy (phases 1 – 4)</td>
<td>R191m</td>
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<td>Pollution control projects</td>
<td>R6m</td>
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<td>2012 onwards</td>
<td>Minimal effluent discharge related projects</td>
<td>R380m</td>
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<td><strong>Total to date</strong></td>
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<td><strong>R730.6m</strong></td>
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Newcastle Works
Newcastle Works
Production Flow and Equipment

Gerald Gadd
GM Newcastle Works
Newcastle Works
Metallurgical Operations

Colin Hill
Works Manager: Ops. Metallurgy
Newcastle Works
Rolling Operations

Fanie Conradie
Works Manager:

Steel Plant

Billet Mill

Rod Mill
Newcastle Works
Rolling Operations

Bruce McQuade
Manager Bar &
Medium Mill
Market Related Issues
Main Industries

1. Reinforcing
2. Structural steels
3. Rails
4. Low Carbon Wire Rod:  
   - Commercial wire rod (Fencing, Mesh, Binding Wire)
   - Steelwool
   - Welding wire (MIG, electrodes)
5. Grinding Media
6. High Carbon Wire Rod:  
   - Rope wire rod
   - Bedding wire
   - PC strand
   - Hose wire
   - Bead wire
7. Black bar
8. Bolt and Nut, Chain making
9. Direct Forging (Re-rolling)
10. Special Steels: Mine roof support, Hollow drill
11. ArcelorMittal South Africa Vereeniging Steel transfers
Market Distribution
Local Sales per Product Group
Newcastle Works

2011 Actual

- Heavy Sections, 12.2%
- Rebar, 14.4%
- Special Bar Quality, 2.6%
- Wire Rod - Cold Heading Quality, 1.4%
- Wire Rod - Free Cutting, 0.1%
- Wire Rod - Low Carbon, 15.5%
- Wire Rod - Mesh, 8.5%
- Wire Rod - Welding, 1.1%
- Blooms, 0.1%
- Alloyed Spring, 0.3%
- Billets, 1.0%
- Light Sections, 13.0%
- Merchant Bar Quality, 14.4%
- Rails, 1.0%
- Wire Rod - High Carbon, 14.4%
- Wire Rod - Welding, 1.1%
- Wire Rod - Mesh, 8.5%
- Wire Rod - Low Carbon, 15.5%
- Wire Rod - Cold Heading Quality, 1.4%
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- Rails, 1.0%
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- Wire Rod - Welding, 1.1%
- Wire Rod - Mesh, 8.5%
- Wire Rod - Low Carbon, 15.5%
- Wire Rod - Cold Heading Quality, 1.4%
- Special Bar Quality, 2.6%
Despatches per Market - 2011

- Domestic: 74%
- Export: 12%
- AOL: 5%
- Transfers: 9%
Export Sales per Product Group
Prime including Africa Overland

Actual 2011

- Rebar: 40%
- Heavy Sections: 11%
- Light Sections: 8%
- Wire Rod - High Carbon: 16%
- Wire Rod - Low Carbon: 8%
- Wire Rod - Mesh: 5%
- Wire Rod - Welding: 1%
- Billets: 10%
- Bloom: 0%
- Merchant Bar Quality: 1%
- Wire Rod - Cold Heading Quality: 0%
- Wire Rod - Cold Heading: 8%
- Wire Rod - High Carbon: 16%
- Wire Rod - Mesh: 5%
- Wire Rod - Welding: 1%
- Billets: 10%
- Blooms: 0%
- Merchant Bar Quality: 1%
- Wire Rod - Cold Heading Quality: 0%
Analysis of Cash Cost Allocation (2011)

Raw Materials: 70.1%
Labour: 6.3%
HQ Cost: 2.8%
Maintenance: 3.3%
Other General Expenses: 2.8%
Refractories: 3.9%
Energy & Water: 10.1%
Other: 0.7%
Analysis of Cash Cost Allocation - Variable (2011)

- Coking Coal (Del), 39%
- Iron Ore (Del), 31%
- Alloys, 10%
- Purchase Scrap, 1%
- PCI Coal, 2%
- Other Raw Materials, 3%
- Operating Cost, 14%
CAPEX – R’mil
Blast Furnace N5
Cold Furnace and Shell Burn Burn Through

December 2010
NEWCASTLE WORKS

Blast Furnace Average Tonnage per Day

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<td>4,104</td>
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Planned maintenance extended.

Dust Catcher incident [5 Aug]

Recovery from cold Hearth incident
Cold Furnace – Short description

- Closed cooling water leak (identified as a tuyere)
- Stop for Planned Maintenance (51hrs)
  - Found another water leak on inspection hole
  - First time ever to find an inspection hole leaking water
- Unstable burden descent after start-up
- Stop to replace 3 damaged blow-pipes
- Stop to replace 1 blow-pipe
  - While stopping filled 24 blow-pipes with slag
  - Change 18 blowpipes
- After start-up freeze trough #1 skimmer (couldn’t lance open)
- Freeze trough #3 skimmer
- Start preparations to Cast on Trough #2
  - All preparations as for cold furnace
Typical Blast Furnace Layout

- Uptakes
- Top Cone
- Throat
  - Throat Diameter
- Stack
  - Water leak
- Bustle Pipe
- Tuyere Breast
  - Tuyeres
- Hearth Diameter
- Hearth
  - Hearth Bottom
  - Under Hearth
- Furnace Pad
  - or Foundation
  - Tap hole
  - Burn through
Burn-through 26 Dec

Break-through on shell and expansion bellow. Large coke particles exited the furnace here.

Stave body burned away and internal water leaks on adjacent stave pipes 432 and 433.
Burn-through 26 Dec

Photo from mini-reline during 2008
Burn-through 26 Dec
Repair Plan

- Install 2x Ledge-coolers in series with current Stave cooling system
- Install 1x Cigar-cooler connected to the closed cooling system
- Replace Shell and expansion Bellow
Lessons learnt

• Water leak was not deemed excessive
  – In future the furnace will be restarted immediately after finding water leak.
• Coke burdening to be more aggressive
  – Stay on all coke (no PCI or gas) operation for longer before and after shut downs
• Abnormal failure of blow pipe doors
  – Implement program to do more detailed inspection and replacement of doors
• Modify blower operating procedure
  – Re-evaluate the blower operational point during stopping and starting of furnace.
  – This will ensure a more robust supply of cold blast air.
• All furnace stoppages to be kept as short as possible in duration
  – Especially in the light of the works only having one iron making unit
Blast Furnace N5
Dust Catcher Failure

August 2011
**Newcastle Works – Blast Furnace Dust Catcher Failure**

**Event**-
- Dust catcher failed on 5 August 2011 while starting up the Blast Furnace after a 39 hour maintenance stop.

**New cyclone vessel**-
- By 8 August 2011, we had been sent photos of a cyclone vessel that could be made available to us from within the ArcelorMittal group.
- By 27 September 2011, the cyclone had been delivered to site in Newcastle.

**Plant Stop**-
- The furnace was out of operation for around 3.5 months.
- The new vessel was successfully installed and commissioned.
- The Oxyfuel burner was used from 21 to 23 November 2011 and first liquids were cast on 24 November 2011.
Overview of Damage
Repair Plan
Management Drives
Newcastle Master Plan

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<th>2012</th>
<th>2013</th>
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<td>• Implement Supporting Tools</td>
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<td>• Review of all KPIs (Shake Down)</td>
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Method: Ideas, PM, Own, Problem Solving, PM
Impact: EBITDA Gains, P; Q; C; S, Optimum Manning, TCO, LTIFR; FPS Level, Availability; Stability, Per Project
**Newcastle Works – Major Projects**

**Blast Furnace Reline**
- Tenders have been received for a number of long lead items;
- Preparing detail costing and scope to get overall approval;
- Reline duration planned for 100 days, starting 5 May 2014;
- Attention is given to the major problem with shortage of skilled resources.

**Sinter Plant Reline**
- Preparing detail costing and scope to get overall approval;
- Attention is given to the major problem with shortage of skilled resources.

**Steel Making**
- Good progress made with the Hollow Jet project.
- Desulphurization plant being commissioned, many design flaws being addressed.
**Newcastle Works – Major Projects**

**Mills**
- The rolling cycles and stock holding is being adjusted for market conditions.
- Re-bar straightening capacity is increased to exploit market opportunities.

**ZED**
- Delay in Group approval – additional information required about the overall coke oven gas cleaning. Application approval now planned for May 2012.
- Reconsidering turn key approach as tenders based on EPCM approach proved expensive.
- Still aiming to complete by end 2013 but the timeline is tight.
Thank you