



CS International and Lonmin Plc, Recipient of WCBF Global Six Sigma Award: "Best Achievement of Six Sigma in Manufacturing"

Lonmin is a FTSE (London) listed company with a dual listing on the Johannesburg Stock Exchange in South Africa. Lonmin is a Platinum Group Metals mining and refining company with its operations based in the Northwest province of South Africa, approximately 50 kilometers northwest of Pretoria. Lonmin is the third largest producer of platinum in the world. It has also historically been the lowest cost producer of platinum. That position had been eroding since 2001. In addition to increasing cost, the growth profile was changing drastically. Costs were offset over the last four years by growth. Over the next four years, from 2004, growth was projected to be relatively flat. The strategic objective for the Lonmin deployment was to reduce the Rand/PGM oz. cost. The latitude this allowed the deployment was that projects could be selected from the throughput side (denominator) as well as the cost side (numerator). This becomes critical to targets since there is a worldwide shortage of platinum i.e. any additional platinum produced could be immediately sold. In fact, with the high price of platinum it made more strategic sense to focus on throughput.

The following were compelling reasons to use the Six Sigma methodology in Lonmin:

- Increasing Rand cost
 - Lonmin let the costs get out of control
 - The South African Minerals Act & other recent legislative requirements
- Appreciation of the Rand
 - Direct affect on US\$ cost
- Growth profile flattening out
 - Denominator [oz Pt] not growing
- Reducing EBIT & EVA
- Conversion of Mining Licence

The CEO, Brad Mills decided in mid-2004 to implement Six Sigma at Lonmin. Brad has had success before with Six Sigma, at BHP Billiton Base Metals. CS International from the United States was chosen as the consultants to design, develop and implement the program for Lonmin. The first 24 Black belts were selected in September 2004, and their training started on 18 October 2004. The training was scheduled

to run until mid-March 2005, with each Black Belt also having a training project to work on during their training period.

The targets set for the company were as follows:

- 15% reduction in unit cost over next 3 years (excluding inflation) with FY03/04 actual as starting point (This approximates to zero unit cost (ZAR/PGM oz) increase over the next three years)
- Increase group EVA by 10% pa for each of the next three years

Six Sigma was to be the chosen program to achieve most of these results. The initial target set by the CEO was for Six Sigma to deliver R64 million in benefits onto the bottom line by 30 September 2005 (the end of the financial year). This target was set cognizant of the fact that this was the first year of the Six Sigma implementation and hence the Black Belts would in reality only have 6 months to achieve this. The Lonmin annual turnover is approximately R6 billion. Full annual results for the 2004 and 2005 financial years can be seen at www.lonmin.com. The 2005 published results specify the audited realized benefits from Six Sigma for the financial year ending 30 September 2005.

The Six Sigma Program Implementation

In terms of project submission the process begins with idea submission. The concept is to not truncate any ideas by asking for specific types of submissions. The submissions are placed on an idea submission form in the E-track software. The idea submissions are routed to the relevant Process Owner to have a Project Charter written and an initial financial analysis performed. The idea, charter, and financial analysis is then submitted to a local steering committee that makes a decision on if and how the project should be performed. This committee is chaired by the General Manager and their staff. They are allowed to make decisions on various methodologies available to them. Inside their pre-view is the option to assign the idea as a Green Belt project. If for any reason the local steering committee feels that the project would be

better served by assignment of a Black Belt i.e. cross functional, urgency, possible higher level tools required, etc. the committee then forwards the idea, charter and financial analysis to the MBB Committee. This committee is made up of the Program Manager and Master Black Belt's. This committee controls the pipeline for Six Sigma projects. They may accept or reject a project as a Six Sigma project or assign it to another path such as a Capital Expenditure Project, Just Do It, etc. This committee has the responsibility to manage the Project pipeline and the projects that are queued in front of any Black Belt.

Because the focus of the deployment is financial there is a full time Benefits Capture Manager assigned to the Six Sigma deployment. They developed a Benefits Capture Protocol to standardize calculations across the Lonmin. The idea submission form classifies a project by its effect as Income Statement (cash flow), Balance Sheet (working capital), projects to avoid expense (risk known), projects to reduce or prevent severity of unpredictable events. Because of the dangerous nature of mining the deployment was tasked with doing 20 percent of its projects in the area of Safety, Health, Environment, Community (SHEC). This was to avoid a single minded approach that ignored projects whose Benefits were frequently difficult to quantify but were still important to the effective operation of the mines. The financial models and the classification of types of projects before initiating a project allowed effective management of the strategic target by the managers and belts.

The implementation of the Six Sigma methodology is a matrix approach. The various steps are controlled through the E-Track system from Instantis and a mentorship program. The Six Sigma program is managed by a Six Sigma Program Manager. The Master Black Belts report directly to the Program Manager and are assigned to a functional area of the operations. Black Belts are assigned to each Master Black Belt, but they may be given projects that are outside the functional responsibility of their Master Black Belt. Every Black Belt has Green Belts assigned

to them. Black Belts are responsible to mentor the Green Belt through their projects.

A Black Belt is assigned projects through the MBB Committee. They are notified through the E-track system and the Charter and financial analysis is included. They are responsible to coordinate the project through the Process Owner and create a team to address the project. The entire project is tracked through the E-track system. That system requires tollgates at the end of each phase. Each tollgate must be approved by the Master Black Belt, Process Owner and Benefits Capture Manager. At each tollgate approval all documentation and analysis must be present in the system for the review. Once a toll gate has been approved the system opens up the next phase for the Black Belt. Green Belt projects follow the same flow and controls with the exception that those projects are assigned by a business unit steering committee.

The ownership of a project transitions to the Process Owner when a project has reached completion during the Control Phase. That process Owner is responsible for the implementation of the solution identified by the Black Belt team. The claimed benefits are tracked through the E-track system. They are carried as an Annualized benefit and revised monthly against actual results. As the monthly results accrue they move from Annualized to Realized Benefits. The entire package is subject to an audit by the Benefits Capture Manager after six months of implementation, and annual audit by external auditors.

The Six Sigma Program Benefits

The following were the actual results achieved by the Six Sigma program at Lonmin:

- 24 Black Belts trained in first wave – 23 certified
- 184 Green Belts trained to date
- 850 Yellow belts trained to date
- 81 projects completed in 2005 financial year.
- **R205,6 million in sustainable realized benefits** – R520 million annualized.

- 6 Master Black Belts have been selected and are in training – to certify in May 2006.
- 7 Black Belts have been returned to the business, of which 6 went on promotion.
- 10 new Black Belts started their training in January 2006.

The Lonmin 2005 financial year ran from 1 October 2004 to 30 September 2005. This means that the benefits attained were in reality achieved in only 6 months. This was from March 2005 when the Black Belts completed their training.

The Lonmin share price is currently at 26 Pounds Sterling. This is quite an achievement from a base of approximately 9.5 Pounds at the end of 2004. The CEO contributes the current high share price to the first year benefits from Six Sigma and the continued benefits Six Sigma would provide into the future. With the Six Sigma methodology becoming more and more embedded into Lonmin, future benefits are optimistic and achievable. For the 2006 financial year, the realised benefits for the four months from 1 October 2005 is already over R100 million. The target for 2006 is over R300 million. The belief that zero defects leads to zero harm has also been adopted by Lonmin.

The ongoing success of Six Sigma is attributable to hard work by many people, but especially the vision and continued unflinching support from the CEO, Brad Mills. Without this support and commitment Six Sigma would not have achieved nearly the results it did. Below are some examples of the CEO's involvement and drive:

- Program initiated by CEO
- Six Sigma targets included in Balanced Scorecards of all VP's and Senior Managers
- Careers of Blackbelts managed by Chief Executive Committee
 - 7 BB's re-joined organisation – 6 on promotion
 - Clear message that the program is part of leadership development

- CEO took personal interest in development of group – multiple 4 hour sessions
- Moved accountability away from Program Manager – VP's to report on progress

CS International

CS International (www.Consult-CSI.com) is a full-service Six Sigma and Lean Enterprise provider based in Scottsdale Arizona. CS International is becoming well known in the industry for their ability to implement high-impact improvement initiatives that deliver benchmark results.

Scot Shank, Chief Executive Officer of CS International states, *"This award is a testament to the power of Six Sigma and Lean when embraced by an organization with a true commitment to Business Improvement."*

Lonmins 2006 mid-term results released May 4th 2006 announce Program benefits of R201,000,000.00.

Lonmins Six Sigma program vision for 2010 is *"Extraordinary success makes Lonmin Six Sigma the new world benchmark."* Lonmin is well on the way to this.