

Refocusing Six Sigma Deployment to Help Drive Business Strategy



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Six Sigma Deployment

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One of the world's largest diversified resources companies has more than 35,000 employees working in more than 100 operations in some 25 countries. The company is among the industry leaders in major commodity businesses, including metals, minerals, and coal. In addition, it has substantial businesses in oil, gas, and liquefied natural gas.

Global Competition

During the past several years, the company's diversified business model, designed to generate more stable cash flows in traditionally cyclical businesses, has been extremely successful, helping the company achieve record revenues and profits. Although some of this success could be attributed to higher market prices and continued global demand for commodities, the company knew that it could not simply rely on favorable commodity prices for future business performance. With demand expected to be strong, but with a highly competitive global market, the company decided to focus on increasing throughput and improving operating efficiencies while doing zero harm to its employees and the environment. To underpin these key business strategies, the company embarked on a Six Sigma deployment as part of its drive for operational excellence.

Establishing Six Sigma

The company believes that the quality of its people and its outstanding assets distinguish it from other companies. To maintain that difference the company is determined to operate safely, efficiently, and more effectively than the competition. Thus, at the end of the 1990s, the company began its drive for operational excellence as a key strategic imperative, using improvement methodologies, operational excellence networks, and communities of practice to achieve its goals.

As one of five key initiatives and operational networks for global business improvement, Six Sigma was introduced in 2001. The Six Sigma "improvement network" joined four other networks, which had already been established: Mine Planning, Mine Operations, Processing, and Global Maintenance.

The strategy focused efforts and projects in four key areas:

- Identifying opportunities
- Achieving sustainable improvement
- Discovering new ideas and sharing knowledge
- Leading global business improvement

Six Sigma Program Results

The company has gained:

- Typical returns on investment (ROI) of 10 to 1 for Black Belts and 6 to 1 for Green Belts.
- Savings of \$6 million in plant operations.
- Savings of \$1 million through decreased absenteeism.
- Savings of \$2 million through shift change improvements.
- Savings of \$1 million through reduced cost of materials.

Implementing Six Sigma Methodologies

Initially, a Global Practice Six Sigma Leader was appointed to coordinate activities across the company's assets worldwide. Regional Master Black Belts (MBBs) – who serve as teachers and mentors of project team leaders, provide support, review projects, and undertake larger-scale projects – were then appointed for each major geographical area to coordinate resources and initiatives locally.

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Six Sigma Methods

Initial emphasis was placed on integrating the Six Sigma improvement network with the other improvement networks. The aim was to combine the knowledge from prior networking experience with that of new discoveries made through the application of Six Sigma, with the expectation that improvement projects would be executed faster and solutions would be more likely to stick. One of the key concepts driving business improvement was that “effectiveness of any project is a function of the technical solutions and the degree of acceptance of those solutions within the organization.” Taking the concept further into global networking activities, the company refined it this way: “the value of any project is a function of the effectiveness of a project at a particular site and the extent to which the project learnings are shared and applied at other sites.”

A Six Sigma training company was selected as the company's initial partner and in 2001 began training Black Belts* and Green Belts**. A curriculum devoted to Six Sigma's DMAIC methodology (Define, Measure, Analyze, Improve, Control) focused on people skills such as facilitation, team leadership, and the softer analytical skills and tools associated with brainstorming. This approach was successful during the early stages when improvement teams were dealing with “low hanging fruit” and when tapping into the experience and knowledge of the other networks was important.

By the end of 2003, more than 500 Black Belts and 600 Yellow Belts had been trained. However, the accreditation process was slow and inefficient, and only 43 Black Belt candidates had been accredited worldwide. Despite a total of 358 Six Sigma projects that produced savings of US\$122.7 million, the program was plagued with major deployment issues, including poor candidate and project selection, lack of discipline for project completion, poor local management support, and candidate attrition due to conflicting operational priorities.

* Black Belts are the leaders of teams who are responsible for applying Six Sigma to a business or operating process.

** Green Belts may lead smaller projects or parts of large projects.

*** Yellow Belts participate on project teams.

Refocusing the Program

At the beginning of 2004, the company's Six Sigma Global Team decided it was time to reassess the progress and performance of the program against leading practices and to go out into the marketplace to invite some of the established benchmark providers to bid for ongoing Six Sigma consulting work. Six consulting companies, including the company's original training partner, were invited to bid. In April 2004, Six Sigma Qualtec International (SSQI) was selected over the prior partner and the four other Six Sigma companies to provide ongoing services for Six Sigma deployment.

Major objectives of refocusing the program:

- Providing a seamless change of business improvement provider.
- Building on the successes achieved with the prior curriculum and training.
- Introduce a sharper analytical focus on DMAIC tools.
- Establishing a more rigorous and consistent Six Sigma approach.
- Setting up a more disciplined deployment organization and structure.

Targets set for Six Sigma initiatives:

- Achieve a 2 percent per year reduction in operating costs in 2004.
- Reach a cumulative target of US\$ 500 million reduction in operating costs in 2005.
- Achieve company business ROI >15 percent in 2006.

One of the first steps in the refocused program was the appointment of an SSQI Master Black Belt as a point of contact (POC) for each geographical area who could work closely with the company's regional Six Sigma Coordinators. A discovery phase then followed during which information was gathered by each POC to formulate global and local deployment plans.



Refocusing Actions

Key actions included:

- Visiting all local asset sites
- Review existing training curriculum and materials
- Meeting and interviewing key stakeholders
- Reviewing projects, progress, and metrics
- Assessing accreditation progress
- Assessing deployment strengths and gaps
- Understanding local business needs and cultures
- Training, mentoring, and support schedules
- Building up relationships with key stakeholders
- Establishing formal deployment reviews

A suite of fully customized training materials was then jointly developed by the company and SSQI to incorporate the existing softer skills curriculum, known as “A-Side Tools,” with a new, more analytical and technical skills curriculum, known as “Q-Side Tools.” This produced a comprehensive set of training materials, which included interpersonal and brainstorming skills and core DMAIC and Lean tools applicable to both manufacturing and transactional business processes.

In order to support Six Sigma and the operational excellence networks, the SSQI SixNet intelligence system – state-of-the-art project tracking software that enables users to overcome the challenges in Six Sigma project management – was implemented to provide global visibility and information on all business improvement activities at all operating levels. The company’s existing Benefits Capture System (BCS) for tracking project financial savings was integrated with SixNet to provide a single, seamless business reporting system. All projects are now entered in the system, which collates data and generates global and regional scorecards.

SSQI Training Program

Training and support schedules were then agreed upon, based on local business needs and performance improvement targets. All new Black Belt and Green Belt candidates were trained with the customized A-Side and Q-Side material. A special two week “top-up” course was also developed for Black Belts and Green Belts who had been accredited through the original curriculum, ensuring a consistent approach for all future improvement project work. Since June 2004, Black Belt, Green Belt, Top-Up, Train the Trainer, and Leadership training waves have been delivered by SSQI in Australia, South Africa, South America, the U.S., and Europe.

During the first SSQI training waves, it became apparent that due to local operational pressures some candidates were not being allowed sufficient time to work on their projects. This was slowing down project completion and accreditation. One of the root causes was lack of support from process owners, who are responsible for the processes to be improved, and project Champions, who select and scope projects that are aligned with corporate strategy, choose and mentor the right people for the project, and remove barriers to ensure the highest levels of success. In order to ensure that Champions and relevant stakeholders fully understood the level of commitment needed for successful completion of projects, a series of start-up presentations and discussions was arranged at each asset. Strict terms of enrollment for Black Belt and Green Belt candidates were then introduced.

These terms included:

- Passing the start-up interview with Champions, process owners, and Master Black Belt trainers.
- Having an approved project charter.
- Scoping the project for completion within the accreditation cycle.
- Having sign-off from the Champion, process owner, and financial person.
- Loading the project in the tracking system.

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Six Sigma Program ROI

To date, more than 500 Black Belt and Green Belt candidates have completed the SSQI training curriculum. Typical returns on investment (ROI) for each training wave have been 10 to 1 for Black Belts and 6 to 1 for Green Belts. Since the inception of the program under SSQI, project completion and reported benefits have accelerated steadily. Candidate accreditation has also increased from less than 10 percent in 2003 to over 60 percent in 2005 and should reach over 90 percent by the end of 2006. According to a survey conducted by the company in 2005, 86 percent of the top 1500 people in the company believe that Six Sigma has been of great help in improving their processes, and 79 percent of the top 1500 managers believe that it has played a significant role in building capability.

Deployment Reviews

Since 2004, local deployment reviews have been established by SSQI POCs in all regional areas to ensure that Six Sigma is aligned to specific asset and cultural needs. Typical deployment reviews include:

- Evaluation of return on investment for each training wave.
- Assessment of training and support evaluations.
- Key stakeholder assessments and engagement strategies.
- Review of performance and engagement against critical success factors.
- Project strategic alignment.
- Project and Black Belt/Green Belt scorecards.
- Accreditation progress.
- Next steps and action plans.

Quarterly reviews have also been established between SSQI POCs and the company's Six Sigma Global Team to review overall performance and progress and to agree on ongoing worldwide business improvement strategy.

Through these reviews, ongoing deployment actions have been identified, including:

- Develop a 3-5 year deployment strategy.
- Set up regional steering groups and develop regional deployment plans.
- Establish more Lean and transactional projects.
- Establish a resource utilization plan.
- Engage the organization in business process management (BPM).
- Continue to reduce accreditation cycle time.

Ongoing strategic actions have also been identified to promote:

- Opportunity identification and strategic alignment of projects and initiatives.
- Sustainability of improvement through employee learning.
- Knowledge sharing through SixNet and global networking.
- Leadership excellence using deployment reviews and stakeholder assessments.
- Self-sufficiency by developing Master Black Belts in all regions.

Oil and Gas Operations

The company's petroleum division operates a significant global oil and gas exploration and production business. At the beginning of 2005, SSQI successfully delivered a three-day Green Belt pilot course in French to the company's petroleum executives in Algeria. Subsequently, the company's European petroleum group decided to run a full Green Belt course in the United Kingdom to help tackle some of their pressing operational problems.

Major business improvement issues included production equipment reliability and maintenance, production output and delivery, and employee safety. The first Green Belt training wave was completed at the end of 2005. Projects chiefly addressed equipment failures and product contamination on offshore production platforms.



Examples of these problems include:

- Platform oil heater failures causing equipment downtime and losses of \$6 million per year.
- Failure of automatic process control systems, causing excessive manual intervention and loss of production estimated at \$5 million per year.
- Well contamination causing need to treat gas after extraction, with additional production costs over \$25 million per year.

Recently the petroleum executive team met in London and agreed that they needed to fully commit to business improvement (BI) and Six Sigma. They are now working on an implementation plan and expect to appoint a petroleum business improvement manager to drive their improvement program.

Coal Mining Operations

As one of the world's largest producers and marketers of export thermal coal, the company operates a global network of high-quality, long-life operations that provide a unique multi-sourcing capability to service the major power markets of Europe, Asia, and the U.S. They focus on delivering on-time, in-specification quality coal products, supported by professional administration, freight, and logistic services. SSQI is providing Six Sigma services to these coal operations.

In South Africa, typical Black Belt projects have delivered an average of \$500,000 per year in savings. Major improvement projects have addressed improving plant operating hours, saving \$6 million; reducing absenteeism, saving \$1 million; improving shift changes on shovels, saving \$2 million; and reducing cost of materials, saving \$1 million. Issues currently facing the business are reorganization of asset management, Rand/US\$ exchange rate, production costs, production capacity and output, safety (with a goal of zero harm), and environmental issues.

In Australia, typical projects have concerned production output. Most of the mines are open cast, and much of the improvement activity has focused on stripping.

Strip ratios of 9-to-1 are not uncommon – that means moving nine tons of overburden and rock in order to mine one ton of coal. Truck and shovel utilization, operational effectiveness and availability, and maintenance effectiveness are also key concerns. In addition, a number of projects in the processing plants are designed to maximize recovery of the ore and to minimize the discarding of good coal as waste. In underground mines, projects have been focused on long wall effectiveness and on issues of utilization and availability. Faced with a global tire supply problem, the mining operations are also concerned with vehicle tire life, which can lead to the idling of trucks, with serious impacts on production output.

Mobilizing Comprehensive Resources

As one of the largest global Six Sigma deployments supported by SSQI, the company's project has involved contributions from all SSQI resources, including initial planning and discovery from SSQI sales and marketing team, material development from SSQI's learning center, training and mentoring from full-time SSQI partners and contract staff, logistics and administration from SSQI support, scheduling, and travel teams; and deployment management from senior and executive SSQI partners.

Regular regional and global deployment reviews have maintained focus and alignment with the client's diverse business and cultural needs, leading to accelerated project improvements and process performance.

During the next year the aim is to work towards internalization of training and mentoring resources and continuing to embed the Six Sigma culture into everyday working life across the business worldwide. This will be achieved through a 3 to 5 year deployment strategy framed around providing the organization with a vision of Six Sigma aligned with continued business success – and significant return on investment.



Your Strategic Partner

Six Sigma Qualtec is a premier provider of process management and performance improvement consulting, training, and technology solutions that drive breakthrough growth, productivity and value for our clients.

We are unique in our ability to customize the integration of management disciplines to meet the industry-specific requirements of global leaders in financial services, natural resources, manufacturing, process and service industries.

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