**BORAL**

Australian Construction Materials

# Six Sigma News

Six Sigma Business Improvement **6**

# BUSINESS IMPROVEMENT IS OUR WAY AHEAD

*with Tony Charnock*
*Regional General Manager*

I am pleased to announce that over the next two years, ACM NSW will implement a comprehensive and internationally recognised business improvement system called Six Sigma.

Six Sigma has a well-earned reputation for being customer-focussed and able to identify and realise improvement opportunities through eliminating defects and variations in business processes.

Six Sigma produces sustainable improvements: its methodology is rigorous and it locks gains in. It has released many billions of dollars of value for companies that have embraced it.

We are making a significant investment in its implementation and we have appointed John Worden to a new position of General Manager, Business Optimisation, to manage the process.

We have contracted a specialist company, Six Sigma Consultants (SSC), to work with us throughout the implementation period.

SSC's Greg Brue and Rod Howes are highly experienced. Greg, an American, was one of the originators of Six Sigma and he worked with Motorola, Allied Signals and General Electric to refine and implement the methodology.

Rod is an Australian and he has worked all over the world on implementations with Greg since early Six Sigma days.

They are the best at what they do and part of their brief is to transfer their knowledge to our organisation so that we can establish an internal capability.

I believe ACM NSW will embrace Six Sigma because it is a good fit with what we do. It is compatible with other improvement initiatives we are pursuing, so they will continue, and it will create a framework for business improvement that we do not presently have.

Our company is renowned for the quality of its products. Six Sigma will focus on improving the quality of our processes and that, I think, is a natural and very important extension for us. I believe it will be readily accepted.

*Tony Charnock*

The rollout has begun. Greg and Rod are engaged in diagnostic work and, in the next few weeks, they will begin training ACM employees.

Six Sigma is here to stay. We are committed to it. It has potential to improve everything we do: from the quality of our quarry products to concrete mix design; from writing orders to purchasing services.

Its benefits, ultimately, will be the health of our business and the satisfaction of our customers.

Our improvement culture is already good; Six Sigma will make it better.

# SIX SIGMA IS HERE, NOW

Six Sigma will have a big impact on the way we do business.

ACM's Six Sigma "champion" is John Worden, General Manager - Business Optimisation, who is working out of Greystanes House at Prospect with SSC consultants Greg Brue and Rod Howes.

John has a keen interest in business improvement and so far, everything is progressing "pretty much as I expected."

The consultants are gathering the data they need to analyse where ACM is and what areas of the business need to be targeted first to achieve the greatest benefits.

John believes the value to ACM will be two-fold: a learning experience to put a process around business improvement; and, gathering the tools required for the job.

Greg Brue explains that Six Sigma is about finding and eliminating defects in processes. "The result of that is to reduce process variation and that is what releases value."
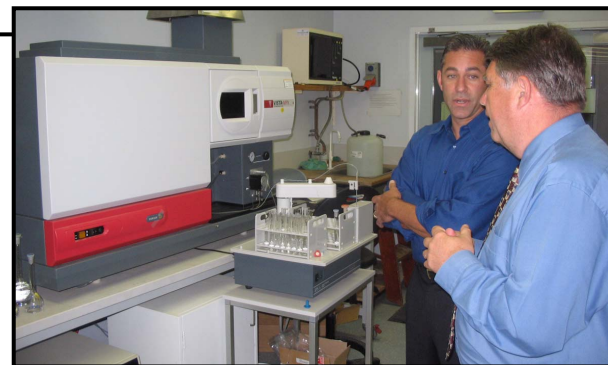


*SSC Consultant Greg Brue (left) discusses the operation of ACM's research arm with Technical & Product Development Manager, Ion Dumitru*

Six Sigma is a data-based methodology and at its heart is a suite of statistical tools that manipulate data to expose defects.

ACM's "best and brightest" will be trained in the use of Six Sigma techniques during the course of the deployment and a critical part of the contract with SSC is a knowledge transfer to create internal capability within ACM.

John believes it is imperative to achieve cultural change through Six Sigma.

"Whatever methodology you choose, ultimately you need to change the way people work otherwise business improvement will not be sustained in the long term."

Greg Brue notes that business leaders are experienced people who tend to have firm views about business improvement. "But if everyone tries to do their own thing then we will take a long time to get where we need to be.

"ACM NSW needs its leaders to get behind this and make sure it works. The best environment will be creative enthusiasm," says Greg.

## THE IMPLEMENTATION PLAN

"Business improvement is never-ending," observes SSC Consultant, Greg Brue. Implementation is being spearheaded for SSC by Greg and business partner Rod Howes.

They are data-gathering and crunching the numbers to verify their initial assessment, done in a five-day national survey of Boral last March.

"We are looking at ACM's concrete business first because that is where we can see some great opportunities," Greg says.

"We have identified materials and pricing as two important areas to study and we are looking for anything that looks like waste."

When Greg speaks of waste he is not referring to garbage bins, rather he is looking for evidence of process variations and defects such as over-production – waste comes in many forms and Greg and Rod find it in the data.

In the identified areas of materials, pricing, logistics, plants and procurement, project teams are being assembled to accelerate the Six Sigma work.

"We need senior people on those teams to clear the way and ensure there are no obstacles to us achieving improvements," Greg explains.

Rod and Greg will run the first Six Sigma project themselves as a case study to get ACM people familiar with the process and as Greg dryly observes "find some easy money."

Concurrently, four or five other projects will get underway, along with a structured training course for project leaders – black belts in Six Sigma language.

John Worden says at this stage all of this should be achieved by the end of this calendar year.

Project champions – the title given to managers who sponsor Six Sigma projects – will also start this year with a one day course for ACM's senior managers.

"We are also going to do a four hour Six Sigma Awareness course for other people on those initial project teams," says Greg.

The implementation plan has not yet been organised beyond that but the vision is to train project leaders in all areas of ACM NSW.

## TIPPER ALLOCATIONS AIMING FOR THE TOP

Coordinating the transport of bulk quarry products from the NSW Tipper Allocations control room at Greystanes House is a little like playing chess.

Team members must deal with individual moves - communicating with customers, logging orders, assigning jobs, confirming deliveries - while keeping an eye on the big picture and using transport resources efficiently.

A key measure for Tipper Allocations is loaded kilometres: the percentage of time that trucks are on the road carrying a load: the higher the loaded kilometres, the better the financial return.

ACM NSW's General Manager Transportation, Andrew Rosengren, says every one per cent increase in loaded kilometres is worth $60,000 - $70,000 per month in avoided costs for the 160 truck fleet. "The Tipper Allocations control room is critical to the operation," he observes. "If we can improve its performance we can save a lot of dollars."

A business improvement workshop held by the allocations team in June identified measures to improve transport co-ordination.
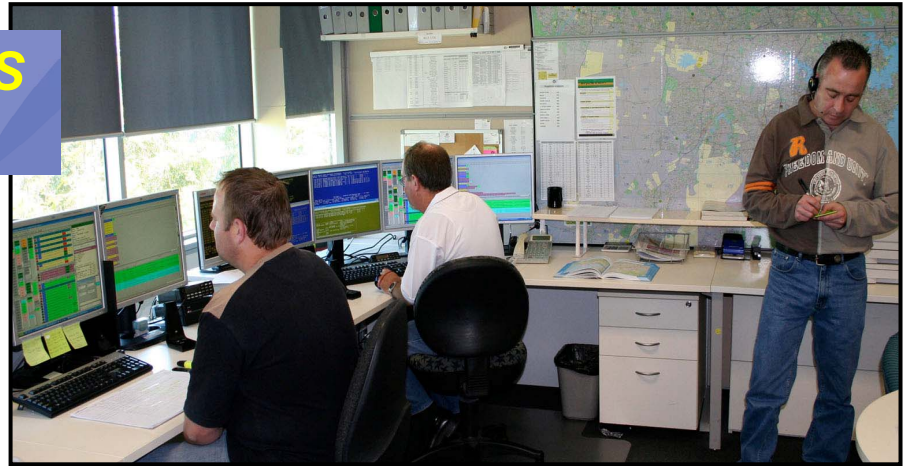


*The Allocations control room. (l-r) Gene Clark, John Dorsman and Craig Pierce allocate transport for bulk quarry product deliveries.*

Supply chain analyst, Belinda Chiswell, says initial improvements include hands-free headsets for team members and a better layout of workstations to allow increased access to and visibility of information.

"We are logging and recording incoming call service levels to give us better data," she says.

The allocations software program is also being adjusted to present accurate truck status information and a process has been developed to capture data on events where delivery failures (stockouts) interrupt downstream processes such as concrete mixing.

Belinda says the activities are stepping stones to achieving ongoing improvements.

"The team's support has been great," she says. "The next phase will delve more deeply into the allocation and scheduling processes where we will need data to help us. We will be looking to utilise Six Sigma tools and its process of define, measure, analyse, improve and control."

# BLACK BELTS, GREEN BELTS, YELLOW BELTS, MINITAB & DMAIC

People trained as Six Sigma project leaders are known as black belts and green belts.

They receive the same training but black belts are nominated to do complex, high value business improvement projects on a fulltime basis; green belts are tasked with less complex projects on a part-time basis.

There will also be yellow belt training aimed at giving workplace team leaders basic problem-solving skills.

Six Sigma's tools are mostly statistical and, while the theory behind them is complex, they are relatively simple to apply using a computer application known as Minitab, the use of which is part of Six Sigma training.

### *"Even people with little or no statistical skills to begin with can quite easily learn…"*

"Even people with little or no statistical skills to begin with can quite easily learn to do some sophisticated stuff in a short time," notes SSC consultant Rod Howes.

"While statistical methods are used to manipulate and verify data, ultimately, much of the work that black belts and green belts do involves managing the way people do processes so there are lots of people skills involved," he says.

Six Sigma applies a rigorous method to problem-solving known as DMAIC, which describes the five phases of the process: define, measure, analyse, improve, control.

Training for black belts and green belts is achieved over five months while they do a project and is delivered in DMAIC phases.
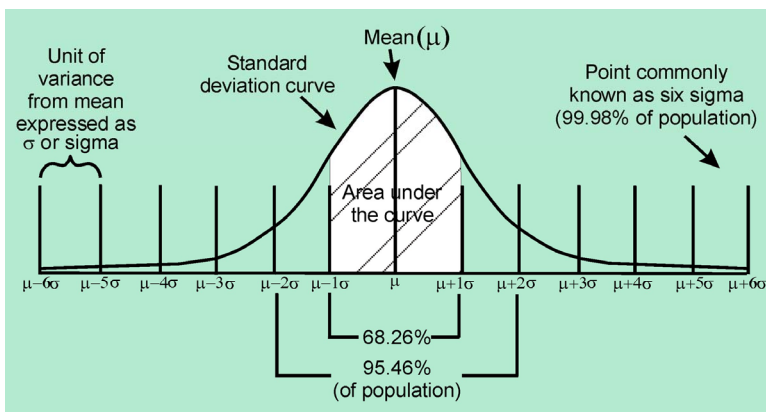
"Initially we will be putting some senior people through this training," explains, ACM's Six Sigma champion, John Worden.

"This first wave of training will build up our capability quickly and then we will progressively extend the training to other people in the company. Over a two year period we expect to have six or eight waves of training."



*A standard deviation curve and some of the features*

This is our first communication and once projects and training get underway, we're planning to accompany the rollout with regular news updates. Meantime, if you have any feedback, drop us a line: **sixsigma@boral.com.au**

## Statistical terms used in Six Sigma include…

| | |
|---|---|
| Mean | the average of a data stream - add each data point and divide by the number of points |
| Standard Deviation | the average distance of each data point from the mean (typically, but not necessarily, a bell curve) |
| Sigma | a measure of variation from the mean |
| Pareto | a chart that ranks sources of variation in a process according to how frequently they occur |
| Failure Mode Effect Analysis (FMEA) | a process which traces all possible failure paths for all variables within a process and prioritises the risks associated with them |
| Process Map | a diagram which identifies all of the steps in a process, including hidden ones, and their contribution to value |
| Measurement Systems Analysis | a measure of the credibility of a data set (also known as Gauge R&R) |
| Baseline Capability | a graphical depiction of the probability of creating a defect at different settings of the variables |
| Error-proofing | control of a process by eliminating defects or changing the process to ensure defects cannot occur (also known as poka yoke) |
| Statistical Process Control (SPC) | a method of controlling unavoidable defects through monitoring and measuring a process and predicting their occurrence |

# THE POWER OF THE DATA

A common experience with Six Sigma during the early stage of implementation is for people to assume that it is all about statistics.

In fact, ask anyone who has been through black belt or green belt training, the stats are the easy bit – the tough stuff is managing people.

Six Sigma uses statistics to identify defects in processes and find ways to eliminate them.

In practice, solutions often involve motivating work teams to change the way they do things.

The other common experience of black and green belts is that having good data helps persuade people who may otherwise be unconvinced.

Boral ACM General Manager Transportation, Andrew Rosengren, oversaw Six Sigma implementation for his previous employer, Comalco.

"What impressed tremendously was the power of the data. When people can see the evidence, change is much easier to achieve."

*Andrew Rosengren*

# THE LANGUAGE OF SIX SIGMA

| | |
|---|---|
| DMAIC | a methodology applied to problem-solving that has five phases: define, measure, analyse, improve, control |
| Define | establish a business case for action based on key performance indicators and define a project |
| Measure | identify suitable project metrics, set up measurement methods, gather data and verify that the data can be trusted |
| Analyse | among the many causal factors, eliminate the trivial ones to expose the (few) key causes of defects |
| Improve | understand the linkages between key causal factors and propose measures to optimise their resolution |
| Control | create a work process to ensure that defects are permanently eliminated, obviated or controlled |
| Black belts | project leaders engaged fulltime in complex, high value business improvement projects |

| | |
|---|---|
| Green belts | project leaders engaged part-time in valuable business improvement projects |
| Yellow belts | workplace leaders engaged in problem-solving using the DMAIC process |
| Master black belts | certificated black belts who have additional training as facilitators |
| Black belt graduates | black belts who have completed one audited project |
| Green belt graduates | green belts who have completed one audited project |
| Certification | award given to a black belt or green belt who has completed five Six Sigma projects and a verbal defence examination by a master black belt |
| Process owners | line managers or work groups who have responsibility for a work process |
| Champions | managers who sponsor projects, act as mentors to project leaders, clear obstacles to progress and provide resources to enable projects to be done |

# MEET THE ROLLOUT TEAM

**John Worden, Boral Six Sigma champion**
John has been with Boral for over 20 years, starting with Blue Circle in 1986. He is ACM's General Manager - Business Optimisation.

**Greg Brue, Six Sigma Consultants**
Greg is a leading practitioner of Six Sigma and an original Six Sigma pioneer. He worked with General Electric's Jack Welch and AlliedSignal's Larry Bossidy on their global implementations. His success model and training content are regarded as the standard in the industry.

**SSC**
Six Sigma Consultants, inc

**Rod Howes, Six Sigma Consultants**
Rod, from Ballarat, in Victoria, led Australia's first Six Sigma implementation in the mid-1990s whilst working with AlliedSignal. He has been with SSC for 10 years and led several Japanese implementations as well as working elsewhere in Asia, USA and Europe.

**John Arlidge, The Media Mill**
John, a writer who specialises in business improvement, is helping with communications aspects of Six Sigma. He performed a similar role during Comalco's Six Sigma rollout.