Ronan Martin-King

Cultural change can transform asset performance

To ensure its future Sembcorp UK, a major supplier of utilities to British industry, had to undergo not only an operational transformation, but also a cultural one. Ronan Martin-King explains how these were achieved and highlights some of the improvements brought by the change process.

Sembcorp Utilities (UK) Limited (Sembcorp UK) is a leading supplier of utilities to some of the most important companies in the UK manufacturing industry. Its Wilton power station at the Wilton International site on Teesside in the northeast of England provides steam, power and other utilities to the major manufacturing companies on the site.

Steam and power operations are vital to the success of both Sembcorp UK and its customers, which operate in the petrochemical, power and biofuels sectors. However, just five years ago the utility was struggling to manage an ageing power station and all its associated problems with limited resources. Initially, the challenges seemed insurmountable. However, in partnership with change management consultant, Reliable Manufacturing, Sembcorp UK embarked on a process to transform its operations.

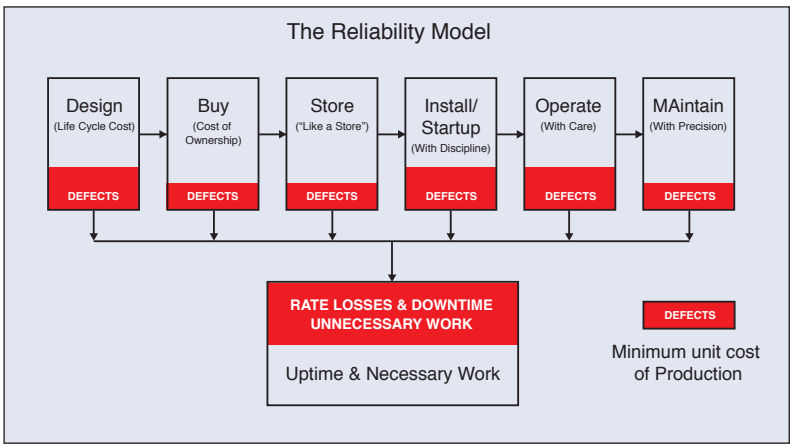

Figure 1: Sembcorp UK followed the Reliability Model as an underlying core philosophy in tackling its performance issues

A NECESSARY CHANGE

The Wilton International site was built by chemicals giant ICI in the 1940s but by the 1990s a change in strategy brought about the gradual sell-off of the ICI bulk chemical businesses on the site. This development brought with it the prospect of the ultimate closure of the ageing Wilton power station.

In 1999 Enron bought the power station along with the rest of the site's utilities and services operations, and began a growth strategy. This was cut short by the company's collapse in 2001. After 18 months of operating as a stand-alone business, it was bought by Singapore-based Sembcorp Industries in 2003, and now operates as Sembcorp UK.

Since then Sembcorp UK has invested more than £150 million ($248 million) in its assets, and further enhanced its reputation as a dependable supplier of high quality utilities and services. At the same time, the underlying business has been put on a sound financial footing.

However, previous good business performance had been aided by the ability to import steam from a third party utility. This back-up supply was used whenever Sembcorp UK's own assets were unable to deliver the required steam demand to its customers. Ironically, because of the commercial nature of the contract, the use of third party steam was often more profitable than running its own assets, a situation which led to a reduced need to maximize the capability of the existing asset base.

With this favourable long-term third party contract due to end, Sembcorp UK's management had by 2005 concluded that in order to maintain its business position, strong action was needed to turn around the performance of its assets. The company needed to become self-sufficient in terms of its ability to supply steam to the Wilton International site, and without this change the business faced an uncertain future.

Jane Atkinson, vice president of utilities operations, who was tasked with leading and delivering the change, describes the challenge the utility faced. "Morale was at an all time low, a 'make-do and mend' culture had set in, and plant and equipment that was the best available at the time of construction, was ageing and unreliable. Although we had large volumes of procedures covering every last detail, they weren't being applied in the same way and many were out of date. I also became aware that this wasn't the only area of concern. We had neglected some equipment, and our buildings required significant restoration. But most of all we had neglected our people. With the ICI divestiture and resulting uncertainty, the workforce had become depleted as people secured careers elsewhere, with many of those remaining seeming to accept that they had 'a job for life' and were content that they would be financially secure as they moved into retirement.

"Our whole culture was one of 'run it and fix it'. Departments were working in 'silos' with little obvious co-operation. Maintenance and Operations were content with blaming each other, and were not engaging with other supporting functions such as stores, purchasing, HR or IT."

STRATEGY AND CHANGE PROCESS

In 2005, Reliable Manufacturing facilitated a 'Operations Excellence Master Class' for the utilities management team. The master class was led by Reliable Manufacturing's principal consultant Ron Moore, with Atkinson and her direct reports participating as well as first line supervisors and union representatives.

The event began the process of engagement and enabled Atkinson and her co-workers to make an initial benchmark of their practices and performance against world class parameters.

The master class highlighted the task ahead and the need for urgent action. There was recognition that restoring pride in doing a 'good job' and winning the hearts and minds of those working on the site were fundamental requirements if change was to successfully happen.

Atkinson was also keen to expose her team to organizations that had faced similar challenges. One of the visits was to BP Grangemouth in Scotland to learn about its site-wide 'Operations Excellence Programme',

which had enabled the business to transform its performance by engaging its first line people in the change process.

Following the visit, Reliable Manufacturing was engaged to develop and lead a two-year 'Change Management Process' for Sembcorp, incorporating the engagement principles as seen at BP's Grangemouth site.

At the heart of the change process was two main elements. The first element was a 'bottom-up' cultural change process at shop floor level aimed at engaging people and developing cross-functional working throughout the organization. This was followed by a 'top-down' process focused on aligning the management team and analyzing critical plant equipment and work practices.

BOTTOM-UP APPROACH

The initial priority, and probably the biggest challenge, was changing the organizational culture. So in early 2006, a series of engagement workshops were launched, running two workshops a month, for all employees. These workshops featured The Manufacturing Game®, which was developed by DuPont as a tool to facilitate organization change.

"The Manufacturing Game was an excellent way of engaging our workforce in the change process," explains Atkinson. "It demonstrated the complexities of running our assets, how the decisions and actions in one area impacted on other departments, the value of cross-functional working and the importance of eliminating thousands of seemingly insignificant defects from our operation." During the workshops the participants discovered for themselves why there was a need for change and heard directly from Atkinson her vision for the site.

Towards the end of each workshop small cross-functional 'Action Teams' were formed, whose purpose was to convert the discussions into concrete actions to eliminate defects from equipment and work practices. Since the start of the process, over 200 action teams have been formed.

This approach encouraged a sense of personal responsibility for making the changes and fostered ownership and pride in the new standards being implemented. These three components – responsibility, ownership and pride are critical to achieving cultural change in any organization. Many of the teams successfully tackled repetitive problems, which delivered improved availability, cost reductions and improved health and safety performance. In addition, the improvements released manpower that had previously been taken up with repairing equipment, which could be redirected to focus on other improvements.

As an example one action team set about improving boiler availability by targeting coal mill feeder issues. One of the major causes of feeder failures was the unreliability of the chain tensioning unit. The team came up with an innovative re-design of the tensioning unit that addressed the problem and as a result reduced boiler downtime by 13 days per annum.

A series of bi-monthly 'Reliability Forums' followed on from the workshops. Attendees represented all aspects of the business and helped to build momentum by providing people with recognition and encouragement as they presented their action team success stories. The forums also provided the opportunity to identify and take action on barriers that needed to be removed to encourage more defect elimination.

As the change process gathered pace, further workshops were held to build organizational capability. These Supervising the Change® workshops were open to leaders and indeed anyone irrespective of their position, who wanted to get more deeply involved. The workshops were particularly effective in helping to redefine the

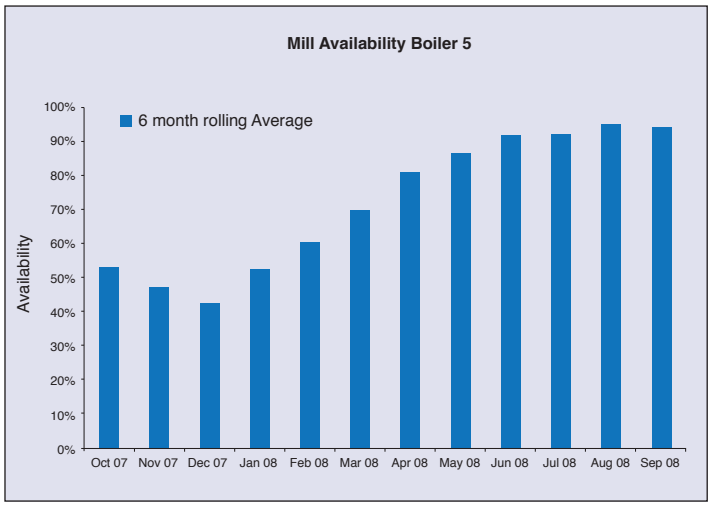

Figure 2: Coal mill availability on one of the two main steam boilers was increased by over 50 per cent in a year, along with a commensurate reduction in maintenance costs

first line leader's role; moving from just coping with problems to identifying recurring defects and launching further action teams.

TOP-DOWN APPROACH

Once the bottom up cultural change was well underway, the next stage of the change process was to align the management team and identify critical systems and practices that needed improvement. Like many businesses, Sembcorp had limited resources to devote to improvement. In fact, many experienced personnel had been lost in a voluntary redundancy exercise in 2000, leaving the business significantly depleted.

The current resource base was already stretched as it began to prepare for two back-to-back six yearly overhauls of the main boilers, which were scheduled to take three months each. So it was vital that the limited time that the management had at its disposal was not wasted on secondary issues but instead was directed at addressing critical priorities.

In order to identify the critical areas a series of 'Criticality Studies' and 'Practices Reviews' were facilitated. First, the site was divided into several areas and criticality studies carried out.

Operations plant manager, Steve Purvis explains: "The criticality studies were a simple and effective method of identifying problematic equipment. The studies took into account both past performance and any potential changes to the condition or use of the equipment that could affect future performance. They helped us to allocate resources to the equipment that was having the biggest impact on the business"

In parallel with the criticality studies, a detailed review of operation and maintenance practices was conducted. This provided an in-depth understanding of how work was currently being carried out. This was compared to best practice standards and priorities for action identified.

Unlike the action teams, which were numerous and relatively small in nature, the improvement tasks emanating from the studies and reviews were larger in scale, typically requiring greater management involvement and funding.

These improvements were delivered by a series of 'Project Improvement Teams', each team with a specific charter, sponsor, leader and team members. The teams were required initially to report progress on a monthly basis. However, although some teams made good progress, other teams struggled to balance meeting day-to-day demands and finding time for improvements.

It was recognized that resourcing was a critical issue and this led to an external recruitment campaign to find additional key resources and skills for the business. However obtaining and bringing new recruits up-to-speed was at best going to be a six-to-nine month process, in some cases much longer. In the interim, a short interval control process was introduced to accelerate the delivery of results.

Every day Atkinson held a one-to-one update session with one or more of her direct reports, each of whom was sponsoring a project improvementsteam. Initially this commitment added more strain to those that were already fully loaded, but it helped crystallize the issues that were impeding progress and ensured that a documented action plan for the next seven-day period was put in place. This proved to be a crucial step in delivering the results.

As the bottom up and top down processes began to kick in a 'Reliability Steering Group' was formed to manage the overall improvement process. The steering group provided a key role in monitoring progress, identifying any gaps and ensuring the correct priorities continued to be worked on.

MAKING THE CHANGE

Sembcorp UK followed the Reliability Model shown in Figure 1 as an underlying core philosophy in tackling its performance issues. The model

demonstrates that the root causes of reliability issues can be a result of factors in design, purchasing, stores, installation/start-up, operations or maintenance practices. It made substantial improvements to its operating processes using this model. A few examples are described below.

- Coal quality: Contamination of coal supplies with metal objects and poor quality coal were found to be key root causes affecting mill reliability and boiler performance. Improvements to the coal specification, screening, metal detection and changes in supplier were made.
- Mill overhaul procedure: The quality of maintenance work on mill overhauls has significantly improved since the introduction of a detailed overhaul procedure complete with digital photos and hold points for engineering verifications and inspections.
- Lubrication: External expertise was engaged to help make a step-change in lubrication standards. As well as improved quality of the lubrication, the number of machines under a supervised lubrication regime rose from 60 to well over 600.
- Feed pump operation: There was a widely held belief that the poor performance of boiler feed pumps was wholly due to the age of the pumps. However on closer inspection a performance improvements team found it was able to improve performance by tightening up the operations procedures, particularly around pump start-up and shutdown.
- Defect tagging: Personnel were frustrated that repairs, particularly to steam and water leaks, were not being fixed as quickly as expected. The fact that that it was not obvious whether a leak had been reported to maintenance was part of the problem. To address this, a visual defect tagging system was introduced.

BENEFITS OF TRANSFORMING YOUR BUSINESS

Now well into the process, the huge effort put in by everyone involved is more than paying off. The culture has now changed with everyone recognizing that they have a role to play.

"At the beginning of the journey we had a 30/70 split between people who were involved and supportive of the change and those that were not. Now the split is around 70/30, which not only makes my job easier, but is helping us to make much faster progress than we were in the early days" says Atkinson.

Plant performance has also been transformed. Coal mill availability on one of the two main steam boilers was increased by over 50 per cent in a year, along with a commensurate reduction in maintenance costs (Figure 2). At the plant level, overall steam boiler availability has increased by 30 per cent. The process has also recently been applied to Sembcorp UK's new biomass power station with impressive results. In less than six months from applying the process, the availability of plant more than doubled (Figure 3).

With the combined bottom-up and top-down approach to improvement, the application of the reliability model and a massive amount of effort by all staff involved, Sembcorp UK has taken a massive step forward to its overall goal of becoming self-sufficient in the steam supply to its Wilton International site customers.

Sembcorp UK is looking forward to expanding the use of this improvement philosophy in all of its operations. The utility has demonstrated how, in partnership with external expertise, it has been able to bring an ageing, run down, heading for closure site, back to life.

Sembcorp is currently looking at expanding its business by acquiring other major utilities sites in the UK and Europe, and is looking forward to using this proven strategy to help transform those sites too.

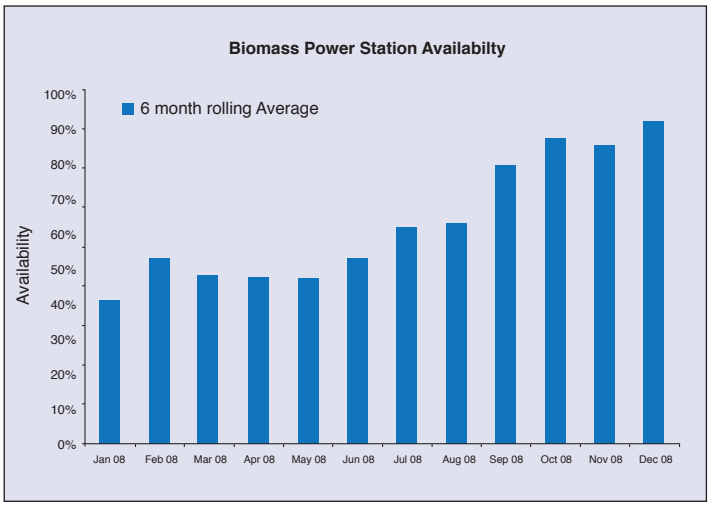

Figure 3: In less than six months from applying the process, the availability of the biomass plant more than doubled