



KEEPING THE MACHINES RUNNING – PROFITABLY

Achieving sustainable operational excellence at DuPont Uentrop

When chemical engineer Reinhold Sand was posted to one of DuPont's largest sites in Europe at Uentrop in Germany in 2007 he found a well-structured plant with no major issues. It seemed to be the ideal training ground for his new role as plant manager. But the easy introduction was deceptive. "A year after arriving in Uentrop, all hell broke loose," he recalls.

Uentrop is a multi-functional plant. Spread over 110 ha, it is the largest manufacturer of polyester fibres in Europe, as well as the biggest production site in the world for polybutylene terephthalate, a thermoplastic engineering polymer used as an insulator in the electrical and electronics industries. The site also makes performance polymers and packaging, as well as Butacite polyvinyl butyral resin sheets for safety glass.

Yet this enviable market position does not tell the whole story. "Uentrop had always been intended as a temporary supplier of our customers in Asia until our Chinese production facilities were up and running. They came on stream in 2008, just before the economic downturn," Sand explains. "So, in 2008, we first lost a complete product group with significant volume to China and were then hit hard by the economic crisis."

So hard, in fact, that the machines at the DuPont plant in Uentrop, Germany stopped running. Matthias Theel, Lean Continuous Improvement & DuPont Production System Site

Lead at Uentrop says, "It was clear we had a big problem on our hands. We had to become more streamlined and competitive, or be prepared to face a long period of negative growth."

ELIMINATING INEFFICIENCIES

As Reinhold Sand explains, "you may have an excellent product, but if your production isn't achieving operational excellence as well, then you are open to falling into the trap of inefficiency – wasting time, effort and resources without achieving sustainable productivity and financial returns."

To protect its plants from these failings DuPont developed its own production system in 2007 and rolled it out to selected sites in Europe and North America the same year. For Uentrop, the timing couldn't have been better.

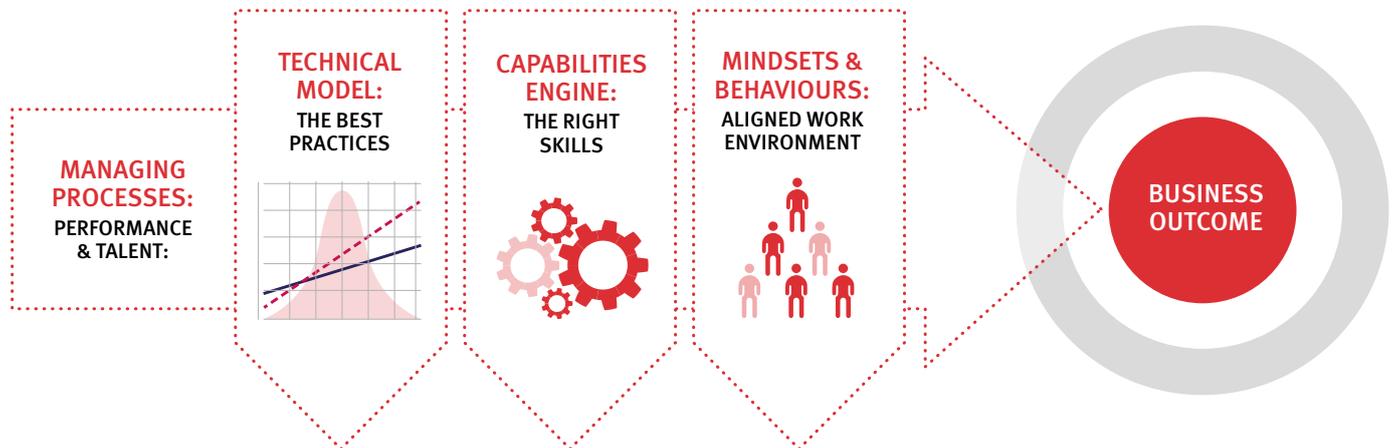
Matthias Theel picks up the story:

"One of the largest cost factors in many production plants is maintenance and this is precisely where we had one of our biggest problems. Back in 2008, each of the four different production groups at Uentrop had its own maintenance team. Add to that a huge central maintenance group that nobody needed or used and we had an obvious starting point for us to trial the DuPont Production System (DPS)."

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PRODUCTION SYSTEM MODEL

An integrated system to enable sustainable, synergistic and measurable results



THE DUPONT PRODUCTION SYSTEM

The DuPont Production System was introduced to the workforce at the Uentrop site in 2008 as an integrated, standardised method designed to engage people and develop organisational capabilities in order to achieve the best possible use of skills and resources, and to eliminate waste. The goal the site hoped to achieve with the help of DPS was complete and sustainable competitiveness by 2011.

The introduction of the DuPont Production System to a plant follows a standard procedure. This consists of a pre-assessment of the site and data collection. Based on the information gathered, the DPS project management team makes its diagnosis and, together with the site management, defines the ideal target state. The team then takes around four weeks to design a new structure and operating system, and plans how to introduce it to a pilot area – in Uentrop’s case maintenance. It then spends almost three months transforming that area, and works on changing the culture and mindsets of the people to ensure continuous improvements take place. Like every model, that sounds easy in theory, but how does it translate into practice? Mr Theel admits, “I’d be lying if I said the initial reaction was positive. There was a good deal of scepticism.”

A CHANGE IN MINDSET IS KEY

For Uentrop, the work began with a site pre-assessment in June 2008. Reinhold Sand points out how important it is at this point to listen to the voices of the organisation. “In addition to an online survey of everyone at the site, we carried out in-depth interviews, held workshops and analysed previous surveys. We knew we would only be able to really solve problems and underlying issues, if we clearly understood people’s needs and concerns.”

This stage is vital to getting the entire organisation on board. Thomas Pfeiffer, DPS programme champion for DuPont EMEA, says: “For change to be effective, people need to understand why it is happening. They need to agree with it and understand its importance. Only if their mindsets change, will their behaviour change too.”

For Uentrop this meant putting a lot of effort into communicating at every stage to ensure support of the transformation process at all levels of the organisation.

Mr Theel, who has worked on introducing DPS to a number of different plants, has seen at first hand how often the tendency is just to pay lip service to a new system. “A good number of supervisors do what a new programme requires, but will undermine their actions by telling their team they don’t believe in it. That’s no good. If your line manager doesn’t believe in a system, neither will you and then the plant will run into problems.”

Mr Theel is a firm believer in role-modelling, which is why he asked to be given a maintenance job at Uentrop after initially coming in as a DPS project manager. “I believe in change. If you don’t change, you end up living in a museum,” he says.

FROM BELIEF TO ACTION

The DPS project team for Uentrop identified potential improvement levers based on the pre-assessment findings, then defined the principles that would help the site towards achieving its ideal future state. Next was an action list for the maintenance area, as well as an implementation plan that included new standard work processes and a new organisational structure.

Uentrop had to move its maintenance organisation from a unit-specific one to a lean centralised structure that still offered the production groups specialist support. “The aim was to end up with a much tighter, smaller maintenance structure that offered a general, central service, topped up by very small unit-specific groups with expert knowledge to solve emergency problems,” Mr Theel explains.

After analysing all the feedback from the organisation, the DPS team pinpointed easily transferable maintenance tasks and drew up an action list which included steps from reorganising the maintenance structure so as to achieve the greatest possible centralisation of planning and scheduling to reducing contracted maintenance work by insourcing. Once applied, these steps resulted in a much more effective hybrid maintenance structure. One much leaner central EP maintenance group now works with four sub-groups.

To achieve this people were trained to carry out a range of different jobs, not just the specialist maintenance tasks related to a specific production unit. Mr Sand explains that “part of the DPS approach is to modify processes and build people’s capability to do other jobs, so they can design their own destiny.” This allowed for the sharing of know-how and created a much more flexible team of maintenance staff which is particularly important in a market where demand may quickly change due to shifts in the world economy.

SUCCESS FACTORS

Matthias Theel looks back and recalls what worked and what didn’t when it came to implementing the original action points. “We knew we had to focus on the factors with the biggest impact,” he says. “We call this the 80/20 rule. It is also known as the Pareto principle, which states that only around 20 per cent of factors account for roughly 80 per cent of results. If you focus on those 20 per cent of causes, you have won a large part of the battle.”

Beyond that, the DPS project team made sure it acted on the suggestions raised during the early pre-assessment interview stage. The team had collected a whole host of ideas from interviewing maintenance staff, production operators and supervisors, local management and the works council

One idea concerned spare parts, which in the past were ordered and purchased in an unstructured way by individual units. That made it very difficult to control overall costs. Now, a new inventory management process ensures a procurement manager is always in the loop, purchases are managed centrally, and tools

and other equipment all go to the central maintenance store before being passed on to one of four sub-stores when needed.

Another way in which Uentrop ensured the new maintenance approach became embedded in the organisation was to make better use of their apprentices. As they were trained, they learnt the DuPont Production System way of doing things. Some left, took a degree and are now new leaders of the maintenance department. “Over 70 per cent of our maintenance team now consists of apprentices,” Mr Theel says. Such confidence does Uentrop vest in them and in its production system that the site is now promoting maintenance supervisors into operations management roles.

Christian Arndt is a previous maintenance engineer at the Uentrop site. He recalls starting his career as an apprentice and electrician in Uentrop in 1998. Mr Arndt then took an evening engineering degree course and was called by his former area manager, just a few weeks after graduating, to ask if he would join the maintenance team for the introduction of DPS. “With hindsight, I was really lucky to have the chance as a young engineer, to experience and actively affect the preparation and implementation of all the small and big changes we made in maintenance over the last few years,” Mr Arndt now says. “When we started the implementation, I was able to see how difficult it is to change processes and even more people’s mindset and behavior. I didn’t expect so much resistance and denial at that time. However, now Uentrop has changed totally. If you walk through the areas you can see DPS at every corner in leaner processes, visual management boards and a much more effective organization.”

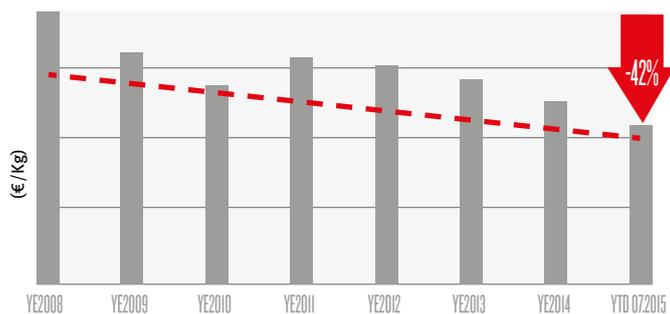
By including all levels of the organisation, ensuring change was introduced by leaders who set an example, by taking on board employee suggestions, creating new examples and processes, and by focusing on iterative improvement, Uentrop managed to achieve the target it had set itself for 2011 and more.

SEEING THE RESULTS

Visit Uentrop today and the difference to 2008 is palpable. Not only is the hum of machines a reassuring, constant background sound, but work stations, storage areas and display boards all look completely different. All material is centrally coordinated, tool kitting and shadow boards clearly show where tools can be found, visual management gives everyone a clear overview of what needs to be done and central scheduling allows for daily and weekly planning. This makes it much easier to move resources between areas based on demand, and results in greater flexibility.

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Matthias Theel says: “We had wanted to become more competitive, streamline maintenance and reduce waste, but had not anticipated that applying DPS would also improve our safety performance. On top of that our absenteeism rate has fallen by half!”



DPP Uentrop Maintenance Cost per produced kg finish product

With greater planning efficiency and improved job execution by a smaller group, Uentrop’s goal of increased competitiveness by 2011 was more than met. Overall maintenance costs were cut by 14 per cent within the space of two years. By 2014, they had been lowered by a staggering 28.4 per cent compared to 2008. This translated into an initial saving of 16 per cent on maintenance costs per kg of DuPont produced product in the first two years. By 2014 this had been slashed by 31 per cent, and in the year to date 2015, maintenance costs per kg of DuPont produced product are down 42 per cent overall.

Mr Sand summarises his experience as follows:

“ In two years we went from being in a dire situation to being a much more efficient plant in much better shape. For us, DPS was the silver bullet. ”

ABOUT DUPONT

DuPont Sustainable Solutions (DSS) is one of 10 DuPont businesses. Bringing customers the benefits of an integrated global consulting services and process technology enterprise, DSS applies DuPont’s real-world experience, history of innovation, problem-solving success, and strong brands to help organisations transform their workplaces and work cultures to become safer, more operationally efficient and more environmentally sustainable.

For more information, visit our website at:
www.sustainablesolutions.dupont.co.uk

DuPont (NYSE: DD) has been bringing world-class science and engineering to the global marketplace in the form of innovative products, materials, and services since 1802. The company believes that by collaborating with customers, governments, NGOs, and thought leaders we can help find solutions to such global challenges as providing enough healthy food for people everywhere, decreasing dependence on fossil fuels, and protecting life and the environment.

For more information about DuPont, please visit:
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