

Training and Development as a Factor for Success

Dr Stefan Schäfer, Christoph Seidensticker and Ludger Thomas, VDZ, Germany, discuss the importance of training courses to ensure the continuous improvement of employee skills and understanding at cement plants around the world.

The processes involved in modern cement plants are complex and highly automated. Technical innovation, alternative fuels, cutting-edge environmental technology and growing productivity have, in recent years, greatly increased requirements in terms of qualifications and flexibility for employees in the cement industry. In these areas, their work is being influenced more and more by technical progress. Without such advances it would be virtually impossible to manage the high-tech plants found in this sector. The training and development of highly qualified staff and the continuous improvement of employee skills are



Customised onsite training programme at a cement plant in Namibia.

Through technical progress and automation, control rooms have become highly complex systems that demand more qualifications and skills from the operators.



thereby a key factor for success for many companies in industrialised countries and emerging economies.

For emerging economies and growth markets the greatest challenges are undoubtedly the enormous increase in production, improvement in manufacturing processes and energy efficiency and the switch to cutting-edge technology. Training programmes must be implemented to educate an unskilled or semi-skilled workforce in order to operate production systems safely and efficiently. Engineers, control room operators and foremen need further training at an advanced level to handle challenges such as energy efficiency, alternative fuels, environmental technology and leadership. The consolidation of specialist knowledge and the communication of experience can also speed up integration in a company and boost levels of productivity and versatility. In Germany, targeted training and development programmes have decreased the proportion of unskilled and semi-skilled workers to less than 10%, a trend that will continue to intensify and spread around the world.

Customised training for all levels

VDZ and its Research Institute of the Cement Industry was founded in 1877 with the aim of combining first class research and high quality services for the advancement of cement production. For more than 50 years VDZ has been offering training courses (ranging from one day to several weeks) for different target groups such as industrial workers, engineers, laboratory personnel, control room operators and foremen. To date, the company has conducted 37 foremen courses (more than 900 participants), 20 production controller courses (nearly 400 participants) and around 200 seminars and workshops (more than 1500 participants).

The success of such development seminars, and thereby the success of students, depends on clear explanations and capable, experienced instructors. They help translate the theoretical knowledge acquired into practical skills and are also able to discuss and

answer queries from participants about specific operational processes. This frequently offers students new insights into existing issues and topics, helping to boost efficiency, motivation and performance. For its seminars, the company calls on an interdisciplinary team of experts with many years of experience in optimising manufacturing processes, technical audits of mills and kiln plants, as well as pre-competitive research.

Besides the regular training programme, numerous customised onsite training courses have been carried out in various languages, such as German, English or Russian. Technical training targets all topics related to cement and concrete production (e.g. the use of alternative fuels, secondary abatement techniques, safety at work, maintenance and the basics of concrete technology) and all personnel working in technical areas of the cement industry. The training courses are usually delivered as classroom sessions, often combined with onsite training that is given both at entry and advanced level. Regular workshops are offered for experts that focus on recent developments, the exchange of experiences and the latest research results. Here, the company benefits from the wide range of research projects in the field of cement production and application in concrete.

Aspiring foremen can gain the necessary qualifications by partaking in a specialised training course. The training covers all major aspects of cement production, from quarry to shipping, at an advanced level and is given as a mix of presence and distance training. Control room operators can receive multi-week training from a beginner to advanced level. The training covers the core aspects of cement production, such as grinding and burning technologies. It also includes at least one week of highly motivating simulator training, which makes use of modern simulation software such as the SIMULEX® training simulator. A range of customised onsite tuition programmes are offered, providing training for cement plant employees in a wide variety of areas (Table 1).

For unskilled or semi-skilled personnel, VDZ – in conjunction with union representatives and German cement companies – developed a range of printed training materials over a period of ten years. The main topics dealt with issues that related to plant production sequences and the work of the production employees. The training materials cover the whole cement production process from entry level to advanced and aim to provide basic knowledge to industry workers.

E-learning courses

In 2007, these documents were transformed into e-learning modules and were made available through an internet-based learning management system. Complex topics are explained using multimedia content, animations, videos and text and students can check their progress through computer-based final tests. More than 70 hours of learning materials cover

cement production, from quarrying to shipment and continuous quality assurance. VDZ offers customised training courses for instructors and HR departments to introduce the platform to companies in the cement industry. Special programmes for authors also allow businesses to create their own online courses and to incorporate company-specific subjects into the learning platform for their own staff. This combination has proven to be extremely effective. Familiar content establishes a connection to the daily routine of the workforce, while the training courses communicate the necessary knowledge for a better understanding of the cement production process. This has shown to improve motivation among employees, who as a result become more versatile where their duties are concerned. One of the advantages of e-learning compared to classroom training is that companies can easily increase the number of people and groups being trained, while at the same time the costs per person significantly decrease. As the majority of courses have been translated into English, the training and development platform is now used by customers all over the world.

Outlook

Since the global demand for cement is predicted to double by 2050, VDZ is constantly extending its support both for national and international cement producers to build, secure and update the knowledge and fundamental skills of their personnel. There will be no let-up in the pressures facing cement manufacturers in coming years due to the growing demand for energy efficiency and environmental requirements. Increasing importance will be attached to development programmes for all employees – whether they are unskilled workers, technicians, engineers or management. In addition, the swift transfer of knowledge from research projects is set to play a greater role at a practical level in order to respond to the requirements made on products and manufacturing processes.

The VDZ development programme strives to cater for these needs with a wide range of practical seminars, training courses and online instruction. Independent from the selected training method, the aim is to provide customers with first-class knowledge and vendor neutral learning experiences. Major potential is possible in this area, particularly where control room personnel and junior management are concerned. Increasing demands are being made on such employees due to advancing automation. This prompted the company to introduce a highly successful training course for control room staff in 1990. It aims to improve current levels of knowledge in relation to environment and process technology for cement production and measuring and open and closed-loop control engineering at cement facilities. Where expansion of its international programme is concerned, VDZ is currently stepping up its worldwide programme for these target groups. 🌐

The animations and videos used in the online courses help to illustrate complex processes in cement plants and facilitate learning.

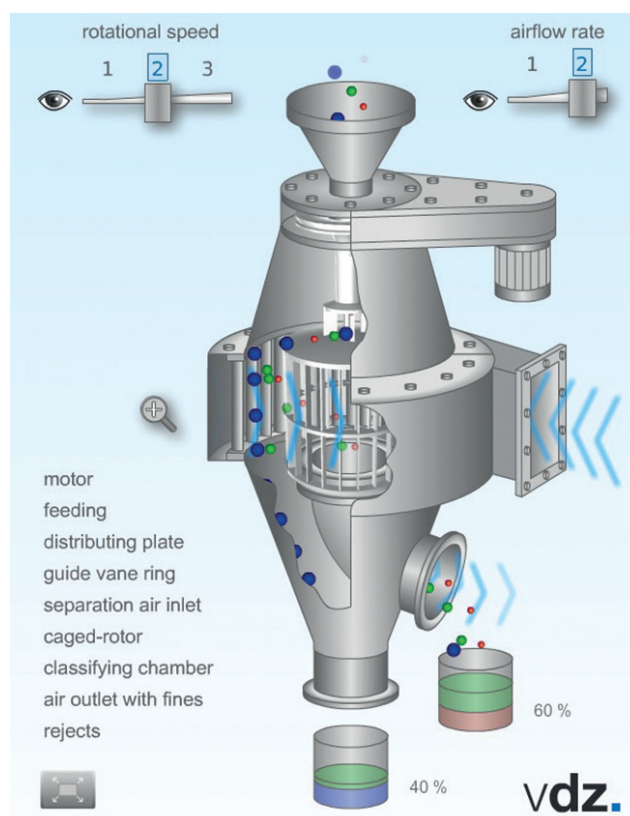


Table 1. List of available and customisable onsite training

Plant supervisor or foremen training
Control room operator training
Use of alternative fuels and materials for cement production
Burner technology for multi-fuel combustion
Advanced burning technologies and precalciner kiln lines
Refractory materials in the cement industry
Limitation of sulfur and chloride cycles using bypass systems
Modern grinding techniques
Introduction to environmental technology and emission abatement
NO _x reduction
Safety at work
Continuous emission monitoring
CO ₂ monitoring and reporting
Trace elements in cement production and products
Clinker microscopy
Chromate reduction and analysis
Test methods in the quality control of cement
Cement properties and concrete performance
Blended cements
Alkali-silica reaction (ASR)
Concrete technology
Maintenance

Case study: HeidelbergCement's global e-learning portal

HeidelbergCement sees its workforce as a major corporate asset and continuously invests in developing their skills. The development of engineers, specialists and executives in connection with effective knowledge management is key to the success of the company. The Global Benchmarking and Training Team at HeidelbergCement Technology Centre offers a detailed training programme for engineers and technicians at the company's production sites all over the world. The company relies both on in-house seminars and workshops as well as on external training courses. Dr Martin Deussner, Director of Global Benchmarking and Training, describes the linking of VDZ's online courses with HeidelbergCement's e-learning platform:

"VDZ has offered online courses in German since 2010 and our German cement plants have been using them successfully for the training and development of their workforce for several years. Due to this experience, we asked VDZ to install online courses in English, which could be accessed by our non-German speaking staff. In addition to the content of the courses, it was vital for us that our workforce would be able to access these courses as easily as possible via HeidelbergCement's already existing e-learning platform. Another requirement was that the questions asked by our employees would be passed on directly to the right experts within our organisation.

"In accordance with these requirements, VDZ and their technical service provider, W3L AG, have developed an automatic registration for our users to directly access online courses via HeidelbergCement's platform. Since May 2013, around 700 HeidelbergCement employees at more than 100 locations around the world, have gained access to approximately 40 online courses. Since VDZ and its partner have successfully reproduced our internal structures on the e-learning platform, our users can send their questions directly to the corresponding experts at HeidelbergCement.

"Our experiences to date have shown that the content of the courses offered by VDZ fits well with our own in-house development programmes. Even participants who don't speak English fluently can successfully follow the courses. The web-based courses offer a high degree of flexibility. Our workforce can access them at any time without following a fixed time schedule for training, which would collide with their daily work routine. Users can also work on these online courses alongside regular classroom training and finally review their progress by interim and final tests. Working through a course module normally takes between one or two hours and can therefore be easily incorporated into the daily routine of the employees. If necessary, they can take a break and continue later. Thanks to the savings in time and travel expenses, online courses have helped us to extend our training programmes. They also enable us to maintain a high level of quality and improve individual training success at reasonable costs."

Dr Martin Deussner, Director Global Benchmarking & Training at the HeidelbergCement Technology Centre, incorporates online courses to extend HTC's training programmes to a large workforce at reasonable costs.

