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“economic development and a steadily increasing population have led to growing cement demand in the region. In order to keep up with this demand and maintain efficiency, cement producers have invested in innovative solutions.”

This “appetite for innovation”, as Salewski goes on to call it, has a key part to play in helping the industry meet the challenges it currently faces. And that is true not just in Southeast Asia, but around the world. Yet there are some trends within the industry that are threatening this appetite. As Mark Mutter and Lawrie Evans of JAMCEM Consulting write in our keynote this month, the process of engineering standardisation at large multinational cement companies can stifle the creativity of local plant engineers.

Although standardisation has been a key strategy adopted by cement companies to counter an industry-wide reduction in engineering resources, Mutter and Evans argue that: “it is essential that this standardisation does not result in a lack of thinking on the cement plant by the engineers.” They conclude that returning some level of local engineering autonomy would “bring back some real engineering thinking into an industry that is already struggling to find the next generations of good process engineers.” That ultimately benefits the bottom line, as plants are able to optimise not just in Southeast Asia, but around the world. Yet there are some trends within the industry that are threatening this appetite. As Mark Mutter and Lawrie Evans of JAMCEM Consulting write in our keynote this month, the process of engineering standardisation at large multinational cement companies can stifle the creativity of local plant engineers.

To this end, a recent news story from Titan USA caught my eye. In January, the company reported that its Pennsuco Complex – which hosts a cement plant, quarrying and aggregates production, block manufacturing and ready-mixed concrete operations – had been certified as a Gold Level Zero Waste Facility. This makes the facility the first of its kind in the US to achieve Zero Waste Status.

“Going through the Zero Waste certification process took us to a new level; it inspired us to discover new and innovative opportunities for recycling and reuse,” said Audrey Fullton, Pennsuco’s Environmental Engineer, who was behind the project. “Rather than automatically sending things to the landfill, each waste stream is now an opportunity to achieve highest and best use.”

With recertification required every three years, Fullton already has her eyes on Platinum Certification. And this is not just her vision: she has company management behind her with Randy Dunlap, President of Titan America’s Florida Business Unit, calling the Zero Waste Certification a “remarkable achievement” and supporting Fullton’s desire to reach the next level.

Part of our role here at World Cement is to highlight such innovation – whether in the areas of plant and process optimisation, environmental protection or health and safety. So don’t be shy: if you have a project or technology to highlight, drop me a line and let me know – and let’s keep the industry moving forward.
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AUMUND wins orders in Egypt and Saudi Arabia

Clinker conveying at Beni Suef, Egypt
In June 2016, Sinoma International Engineering subsidiary, Chengdu Design and Research Institute of Building Materials Industry (CDI), received a contract from the Egyptian government to build six 6000 tpd clinker production lines in Beni Suef. In January 2017, AUMUND Fördertechnik GmbH, in close cooperation with its Chinese subsidiary AUMUND Beijing, received the order to supply the clinker conveying equipment for the project.

The identical lines will be equipped with four AUMUND BWG belt bucket elevators, with capacities of up to 650 tph, and three BWZ chain bucket elevators, with capacities of up to 550 tph. The machinery package also includes four BWG-L belt bucket elevators (170 tph), one BWZ-L chain bucket elevator (80 tph) and six pan conveyors (375 tph) for each of the six lines.

The greenfield project is expected to be completed within the next three years. The pilot phase of the new production lines is due to start as early as December 2017. The 108 machines will be supplied by AUMUND in three deliveries between April and June 2017.

Yamama orders clinker conveying equipment
AUMUND has also received an order from Saudi Arabian cement producer, Yamama Saudi Cement Co., which will start up two clinker production lines at a new site to the southwest of Riyadh in 2018.

With a combined capacity of 20 000 tpd, the two lines are being built by thyssenkrupp Industrial Solutions. As announced last month, AUMUND Fördertechnik GmbH will supply the clinker conveying equipment for both lines.

The supply package includes 29 chain bucket elevators and 18 belt bucket elevators in both heavy-duty and lighter designs. AUMUND belt bucket elevators will be used for raw meal, while filter dust will be conveyed using the company’s chain bucket elevators designed for low capacity.

Two AUMUND double chain bucket elevators with a 2300 tph capacity have been ordered per line as recirculating bucket elevators in the cement mill. Double chain bucket elevators have been specially designed by the company for capacities over 1300 tph by combining two standard central chain bucket elevators. Both bucket strands run over the same drive shaft, which is held by pillow block bearings and driven by double drive units. The symmetrical distribution of weight means that the chain and drive shaft will have long lifetimes. There is no mechanical connection between the two bucket strands. The chain wheels and tension shafts have separate bearings, so that any lengthening of a chain that might occur after a long period of operation can be adjusted independently of the other.

Supply also includes six AUMUND pan conveyors, as well as various flat gates, silo discharge gates, telescopic chutes, and cleaning conveyors.

“We won the order, among other things, because of AUMUND’s expertise in advising on concept and design,” said AUMUND Managing Director, Robert Gruss. “Our strategy is to put our focus on a close relationship with our customers, accompanying them from the initial planning stages right through until after commissioning, and it is gratifying to reap the rewards.”

Canada McInnis Cement plant approaches completion
Construction at McInnis Cement’s new cement plant and deep-water terminal in Port-Daniel-Gascons, Canada, was nearly 90% complete by the end of last year, according to a company update. The company now expects the plant to enter operation by Spring 2017.

Work at the site stepped up towards the end of last year with sometimes as many as 1500 people working onsite. Recent activity at the site included quarrying and tests on the crushing line and the conveyors that will transport limestone from quarry to plant. The site also received several transport ships loaded with raw materials.

In November, the company announced that it had secured CAN$280 million in new financing, allowing it to complete the project on schedule, including CAN$125 million from both the Quebec pension fund, Caisse de dépôt et placement du Quebec, and BlackRock Alternative Investors.

The McInnis Cement plant is currently one of the largest industrial projects under development in Canada with total investment exceeding CAN$1 billion.
Georgian Cement Association launched

HeidelbergCement Caucasus (HCC) and the Georgian Building Group, a subsidiary of Kavkaz Cement, have founded the Georgian Cement Association (GCA). The foundation of the GCA was announced at a press conference in the Tbilisi Marriott Hotel.

The initial purpose of the GCA is to ensure the quality of domestically-produced cement through the quality testing of bagged cement. According to the statement, bags will be purchased anonymously on the open market and distributed to testing laboratories on a blind basis.

Testing will be conducted primarily by an independent and neutral laboratory, such as the Georgian Technical University, and confirmed by parallel testing. The Chamber of Commerce and Industry of Georgia will supervise the process to ensure its independence and neutrality.

“The goal of the GCA is to create a respected and well-recognised ‘Good Quality Seal’,” the press statement said. “Only GCA members in good standing shall be entitled to advertise the quality of their products in this way. In order to become a member, each producer must first have the quality of its products certified by testing for a period of time before they are accepted into membership.”

A second issue the GCA will tackle is to ensure “competitiveness and the economic viability of the building materials industry in Georgia.” This includes the aim of reducing the need for imports and maintaining jobs, expertise and experience within the Georgian cement sector.

Gebr. Pfeiffer to provide mill to Kaspi plant

In November 2016, Gebr. Pfeiffer SE received an order to supply a vertical roller mill that will be set up in HeidelbergCement’s new 3000 tpd kiln line at its Kaspi plant.

The type MPS 4000 B mill is equipped with an SLS 3750 B classifier and has been designed for a capacity of 270 tph raw meal. The mill will be delivered with an enlarged housing to allow raw material with up to 10% moisture to be dried almost exclusively with the available preheater gases.

The order was placed through the Chinese general contractor, Sinoma Chengdu. Commissioning of the plant is scheduled for 2018.

Claudius Peters awarded contract by SCG

SCG, Thailand’s largest cement producer, has awarded Claudius Peters a contract for the delivery of a new cement silo. The silo will be delivered to Mawlamyine Cement, 300 km southeast of Yangon.

Claudius Peters will deliver an EC storage silo, with an 18 m dia. and total volume of 10 700 m³. The EC storage silo was chosen due to its lower height, in comparison to the company’s existing silos of similar capacity. The scope of supply also includes various aeroslides. Commissioning is scheduled for July/August 2017.
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Hanson is implementing a £25 million, seven-year project to improve production efficiency and emissions at the Ribblesdale cement plant in Clitheroe, Lancashire, north England.

During the first six months, £11 million is being spent on improvements and maintenance to enable the plant to meet new dust emission regulations. This is the biggest investment programme since the 1990s.

It includes a £2 million replacement of the filters on two cement grinding plants. According to Plant Manager, Terry Reynolds, they will run well below the new maximum dust emission levels after the installation.

“The permitted dust level is being reduced by 66% in April, from 30 mg/m² to 10 mg/m². The new equipment will perform better than this,” said Reynolds. “Although we have to make the change to continue operating, we always strive to minimise our environmental impact in how we run and maintain the plant.”

The largest investment is a £6.5 million replacement of the wet gas scrubber. The site was the first UK cement plant to use gas scrubbing technology in 1998. Environment Manager, Nick Sharpe, said that replacing the scrubber will be one of the biggest changes to the plant since then. “It removes the just-struck-match smell that can result in complaints from our neighbours and the sulphur that comes from the alternative raw materials we use,” said Sharpe.

The three month scrubber installation starts in March but work to replace ducting around the plant was completed during a shutdown in January. In total, 75 m of ducting was fitted during the £470 000 project, as part of a five-year improvement plan for the site’s exhaust gas handling system.

“The ducts dated back to the 1980s so needed to be replaced,” added Sharpe. “They range in size from 3 – 5 m dia., and the new lengths prevent fugitive emissions leaks and improve overall efficiency, since cold air is not sucked into the process, so there’s a double benefit.”

Buzzi Unicem USA has announced that four of its US cement plants have been awarded the ENERGY STAR label by the US Environmental Protection Agency (EPA) for superior energy performance. Buzzi’s Chattanooga, Festus, Maryneal and San Antonio plants received the honour.

This marks the eighth consecutive year that the Chattanooga, Festus and Maryneal plants have received the certification.

To qualify for ENERGY STAR recognition, cement plants must score at least 75 on the Energy Performance Indicator used by the EPA to measure energy efficiency, and have a three-year history of environmental compliance.
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Germany  KIMA sells five KilnCooler HotSpot systems

KIMA Echtzeitsysteme, a German manufacturer of measurement and control systems for the cement, minerals and energy industries, received orders for five KilnCooler HotSpot systems in December from four cement plants in Germany.

The system monitors kiln shell temperature and cools only the specific spots that show temperatures above a setpoint. This helps to avoid a kiln shutdown and helps to prolong refractory life.

Hotspots in the kiln are a growing problem for cement plants, as the use of secondary and alternative fuels grows. These fuels are relatively inhomogeneous compared to traditional fossil fuels, which results in more fluctuations in the burning process – and the formation of hotspots.

According to KIMA, one cement plant ordered a second unit only four weeks after it placed its first unit and also recommended the system to a sister plant, which purchased the system.

Including the systems in Germany, a total of 22 KilnCooler HotSpot systems are now operating worldwide.

USA  Pennsuco receives Zero Waste certification

Titan America’s Pennsuco Complex has been certified as a Gold Level Zero Waste Facility by the US Zero Waste Business Council, making it the only facility of its kind in the US to achieve zero-waste status.

“The Zero Waste Certification is a remarkable accomplishment and consistent with Titan America’s commitment to strive for best-in-class sustainability practices,” said Randy Dunlap, President of Titan America’s Florida Business Unit.

To qualify for Zero Waste Certification, the Pennsuco Complex was required to demonstrate more than 90% diversion of waste from landfill for a minimum of 12 consecutive months. This includes recycling, reusing, reducing, or composting waste materials, or recovering the materials for productive use in nature at biological temperatures and pressures.

The certification process included an onsite audit, which was performed by Zero Waste Council members.

Pennsuco’s efforts to achieve zero-waste status was initiated by the complex’s Environmental Engineer, Audrey Fulton, who called the certification a major achievement. “Going through the Zero Waste certification process took us to a new level; it inspired us to discover new and innovative opportunities for recycling and re-use,” said Fulton. “Rather than automatically sending things to the landfill, each waste stream is now an opportunity to achieve highest and best use.”

Recertification takes place every three years with Fulton and Dunlap both aiming for Platinum Certification next time around.

Located west of Miami, Florida, the Pennsuco Complex includes cement production, aggregates, quarrying, block manufacturing and ready-mix concrete operations. The cement plant has a production capacity of 2.4 million t, ranking it the largest cement plant in Florida. Its quarry is the fifth largest such operation in the US, producing more than 7.5 million tpy of limestone products.

Pakistan  FLSmidth receives order from Maple Leaf Cement Factory

FLSmidth has obtained an order from Maple Leaf Cement Factory for the engineering, procurement and supply of equipment for a complete cement production line with a capacity of 7300 tpd. The plant will be located in Iskanderabad in the Mianwali District, Pakistan.

The order includes a complete range of equipment, from crushing to packing and loading, along with equipment from product companies of FLSmidth: planetary gear units from FLSmidth MAAG Gear, electrostatic precipitators and fabric filters from FLSmidth Airtech, a packing plant from FLSmidth Ventomatic, a control system and plant automation from FLSmidth Automation, and weighing and metering systems from FLSmidth Pfister.
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Germany Fritsch releases new jaw crusher

Fritsch has released its most powerful jaw crusher, with up to 3 kW drive power to ensure high throughput during the pre-crushing of hard or very hard, brittle materials. The crushing jaws can be swivelled out or removed for easy cleaning, while the integrated dust exhaust channels provide optimal working conditions. With two models available, the perfect jaw crusher for the feed size and sample quantity can be selected.

- Up to 3 kW drive power for processing higher throughput in shorter times.
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- Low noise and dust-free operation.
- Variable crushing jaw kinematics for higher final fineness.

The PULVERISETTE 1 premium line has a completely accessible grinding chamber, because the fixed crushing jaw is mounted in a guide and can be removed with a single motion. The movable crushing jaw can also be swivelled up and locked there to enable a completely accessible grinding chamber for fast, efficient and safe cleaning.

The zero-point adjustment can be calibrated and is connected with a progressive grinding gap adjustment. With a single motion, the double eccentric can be used to precisely set the grinding gap in millimetre increments and in smaller increments for the finer particle range.

The PULVERISETTE 1 line also offers the easy, fast and convenient changing of the kinematics. Selecting the ‘Eccentricity Normal’ setting provides the fastest possible comminution due to the approximately circular oscillation of the crushing jaws, while the ‘Eccentricity Small’ setting gives a narrow particle size range using vertical shearing motions. This provides optimal adaptation to the breaking characteristics of the respective sample.

UK Thermoteknix launches Multi-View kiln and cooler camera system

Thermoteknix has announced the launch of the ThermaScope HD kiln and cooler camera Multi-View system. The new measurement, recording, and analysis system for Thermoteknix HD kiln and cooler cameras provides real-time screen displays with picture-in-picture layouts to co-ordinate and continuously record video data and events. An innovative user interface (UI) removes the need for typical Windows menu format to maximise the image presentation and to carry out temperature recording, I/O, alarms and analysis in the background. Full OPC compliance provide integration to plant automation and control, without the need for custom programming.

With emphasis on interactive graphics, a continuously updating timeline is shown that provides access to past history, allowing the user to scroll the kiln and/or cooler video backwards or forwards in time to review, recall, or compare fuel changes and events in the pyroprocess. According to the company, ThermaScope Multiview software “transforms today’s kiln camera imaging products into a continuous on-demand video”. This allows the operator to navigate graphically through past events, viewing the kiln process as ongoing and illustrated in the timeline.

Multi-View provides the engineer with the ability to trend prospectively or retrospectively any point or area in the image by placing tools on the live (or historic) image to show the effects caused by changes in operational parameters, fuel, combustion, kiln speed, or other factors affecting production and clinker quality.
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MARK MUTTER AND LAWRIE EVANS, JAMCEM CONSULTING, UK, EXPLAIN THE IMPORTANCE OF ADAPTING STANDARD TARGETS AND PRACTICES TO LOCAL PLANT CONDITIONS.
Introduction
For a process engineer working within the cement industry, the challenges are becoming ever greater. The demands for higher profitability from the plant continue to grow and these demands are expected to be delivered with increasingly fewer resources. CAPEX is often limited to projects that will deliver a payback of less than two to three years; both maintenance and sustaining expenditure are squeezed to minimal levels; and many of the easier opportunities for improving profitability – the so-called low hanging fruit – have already been implemented.

For managers of cement plants, getting the right people to undertake these engineering roles has also become difficult. In many countries, fewer young people see engineering as an attractive career path, preferring to take degrees in areas such as finance and IT. This has led to a reduced pool of available engineers, with many of these seeing the cement industry as unglamorous, dirty and hot, and therefore preferring less challenging roles in other industries.

In addition, the drive for profitability and the implementation of ‘synergy savings’ when companies merge has resulted in a reduction in engineering resources both on the plants and in the corporate centre. Unfortunately, those that leave are often those with the most experience, taking with them years of knowledge of the plant. For those that are left behind, the learning curve is steep and little guidance or mentoring is available to develop the capabilities of younger engineers. To compound this problem for plant managers, any engineers that do come into the company that show promise for the future are frequently fast tracked into corporate roles. This interrupts the engineers’ development at too early a stage for the learning process to be sufficiently completed.

Standardisation of process evaluation
One way in which many cement companies have tried to address the reduction in engineering resources
on the plants – as well as the lack of experienced engineers to mentor and train the new intake of engineers – is through the standardisation of engineering practices and procedures. While it is common practice to develop standardisation within a company – especially as it grows – it is essential that this standardisation does not result in a lack of thinking on the cement plant by the engineers, such that all the engineer is doing is comparing the data from their own plant with that which is found in the in-house reference manual.

At no time is this practice more wasteful and unproductive when performing plant test work. Much effort goes into organising the team to complete a mill audit or pyroprocessing heat balance, taking the measurements, having the laboratory analyse the samples that are taken and completing the calculations from pitot traverses and other measurements. Engineers need to remember that plant test work is not just a tick box exercise to produce a series of numbers, but a way of identifying opportunities to improve performance on the plant.

With all this effort being invested, it is essential that the test work is completed in a manner such that all the measurements are accurately taken and that correct conclusions are drawn from the measurements. As each plant is different, both in design and raw materials, the required test work on each plant will differ, and the standardised methods of plant testing will not always take into consideration the differences between cement plants. As an example, when completing a pyroprocessing audit, some areas that can be missed when following the standard procedures are as follows:

- Not correctly calculating the heat losses from the volatiles bypass, which is made up of three components: the heat value in the hot gases leaving the system; the heat in the meal leaving in the system and the energy that has been input into the meal leaving the system to partially decarbonate it.
- Not taking into consideration the losses from carbon monoxide emission or the heat value lost in unburnt fuel – especially important when using natural gas as a fuel – which can be obvious areas for process optimisation.
- Not measuring the power consumption of the main fans to allow a cross-check to be made on the measured airflows.
- Failing to take oxygen measurements all the way from the kiln exit to the final fan to understand both where inleak is occurring in the gas handling system and the impact that this may have on the pyroprocessing system.

Before any audit, the process engineer needs to consider their own specific plant and what needs to be measured, while taking reference from the standard examples given in the company reference manual.

Following completion of the audit and the calculation of the results, further thought is required as to how these results are going to be used for process improvement. For all this effort to end up in a report that simply compares the results of the work with the standards in the reference manual adds minimal value to the engineering effort, apart from indicating whether the numbers are in the correct range or not. Proper engineering needs to be applied to the results of any process test work with one of the following considerations applied:

- If the results of the test work show that the equipment is operating within the expected range, is there any way in which the equipment could be further optimised to reduce costs or improve performance, and how does this result affect the overall performance of the system.
- If the result falls outside of the expected range, why is this happening? What needs to be further investigated to bring the equipment back into the ideal operating range? Who needs to take actions to correct the situation?

Process engineers also need to consider the readership of the reports that are produced from this test work. For example, a process engineer presenting the results of the audit by simply comparing their results with a set of standards will not assist the production manager in knowing that he needs to plan to install new refractory in the annual repair due to high shell losses. It will also not help the mechanical engineer to identify areas of high inleaking air that are costing the plant additional fuel and power consumption, as well as lost production on the kiln. It is a key role for the process engineer to not only take the measurements and understand what these plant measurements mean, but to translate them into a form that the other disciplines on the plant can understand and from which action plans can be developed.

**Standardisation of targets**
In standardising the process engineering function down to the level where the process has defined operating parameters, it is necessary to take into account that there are a number of variants for a particular process type, as well as different process configurations for the same description. Examples of this are as follows:
The MMD Twin Shaft MINERAL SIZER™ has the ability to process a wide range of materials, from hard limestone to sticky clay, either separately or combined. Together with the unique churning action of the counter-rotating shafts, this makes the MMD Sizer ideal for blending and perfectly suited to the demands of the cement industry.

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When considering a four-stage calciner, we could be talking about a single string or twin string calciner. Even within the twin string calciner, we could be considering an in-line calciner or a separate line calciner.

When considering a closed-circuit ball mill, there are a number of different ways the mill could be vented, and the configuration of the separator can be different in terms of how the final product is collected.

All the subtle differences in the equipment type and configuration mean that instead of a specific target for each plant being developed (for example for fuel consumption or power consumption), ranges of values are supplied as acceptable results. While this may be satisfying for the process engineer to find out that they are within the acceptable range, it does not provide a great deal of motivation to find the true target of the individual piece of equipment and then identify the potential performance improvement gap.

For example, when considering a pyroprocessing system, the following factors need to be considered:

- The chemical and physical composition of the kiln feed to the system – in particular the lime saturation factor (LSF) of the feed to the system. In countries where lower LSF clinker is produced, there will be lower kiln fuel consumption, and therefore this should be considered in the definition of the target. Without taking this into consideration, other process inefficiencies may be masked by the contribution that the lower LSF has for the whole system.

- Carbon in the raw meal, which will normally result in a lower fuel consumption target compared to a plant without fuel in the raw materials. In plants that have carbon in the raw materials, consideration of the burn-out characteristics of the carbon is also required to determine the contribution to the fuel consumption reduction.

- The use of a volatiles bypass, with the target being defined as the minimum level required for the removal of the necessary amount of chloride or sulphate, not the level at which the plant feels comfortable.

- A reasonable number of stoppages for the line so that the monthly/annual average fuel consumption can be compared to the actual results, as opposed to the monthly/annual average being compared to the company standard, which is normally a steady-state fuel consumption.

Similar comments can be made when considering the power consumption of the plant. There is little value in having a standard figure for each process stage defined in a reference manual when a plant-specific target can be developed. This should be a bottom up approach, taking each process stage and breaking it down into the elemental parts. Examples of this approach are as follows:

- For raw milling on a vertical mill, the mill motor power consumption should be calculated based on the target raw meal residue and mill throughput. The mill fan power should then be calculated based on the necessary airflow for the mill throughput. The separator power and auxiliaries can then be added to give a power consumption for that plant section.

- For cement milling, the mill motor power target should be at the maximum addition rate of secondary cementitious materials (SCM) that is allowed under the local standard for the cement type, not the level that is currently produced. This then gives impetus to improve the quality of clinker used in the cement and the separator performance, and develop any necessary capital investment plans to increase the level of SCM addition. The power required for the separator and ancillaries can then be added to this target.

Even when targets for process stages have been developed in this way, it is still necessary to monitor the main drive's consumption level, compared to the target, to identify any drift in performance. For example, a steady upwards drift in the power consumption in the cooler exhaust fan could be a sign of increasing inleaking air across the cooler exhaust system, which would merit further investigation. Using a well-configured power monitoring system can greatly improve the overall control of power consumption of the plant.

**Global standards for local plants**

One of the most illogical issues that arises is the implementation of global targets that do not make either financial or business sense. An example of this would be the implementation of a global alternative fuels substitution rate, where all plants within a company must reach a certain substitution rate. While this may be done for the right reasons, to satisfy internal targets and external commitments to long-term sustainability, it does not make sense in the following situations:

- When the local source of fuel is subsidised, making it so cheap that the implementation of the alternative fuel project will not give a return on the investment.
When alternative fuels are scarcely, or not reliably available, due to an inadequate collection structure or tax on the fuel’s disposal, meaning that the cost of the alternative fuel is higher than the cost of the conventional fuel in use.

When alternative fuel suppliers increase the price of the fuel over time, which results in the cost of the fuel mix increasing to similar levels as the conventional fuel.

When the use of alternative fuels reduces the kiln output to a point where the market demand cannot be satisfied.

In each of these cases, it does not make sense to either implement or continue with certain alternative fuels simply for the sake of maintaining the company target.

A similar case also exists with a global cement-to-clinker ratio. Reducing the quantity of clinker in cement brings financial benefits, as well as reductions in CO₂ emissions. It is also an effective method of increasing the cement production capacity for a fixed clinker output. However, the materials must be consistently available at a reasonable price and the plant must be capable of producing cement that is competitive and appropriate for the local market.

The way forward
The use of standardisation itself is not a bad thing and is required as companies get larger; however, this standardisation cannot be allowed to lead to a lack of analysis and implementation of engineering solutions. It is not surprising that some of the most innovative engineering solutions that are seen by JAMCEM Consulting are in small companies with fewer sites, that have minimal standardisation and less engineering resources at the head office. In these plants, engineers must be truly innovative and use the limited resources that they have. This does not mean to say that, where the opportunity exists within a large company, thought should not be given to how younger engineers should be trained – exposure to several plants with different processes and operational issues will give the engineers a much broader starting point from which to consider how their own plant can be optimised.

Just as many companies change their strategies to improve their performance, it is perhaps time that some of this standardisation is blended with a certain degree of localisation. Adapting the targets to the local conditions and raw materials, and the cement types that are required in the market should bring back some real engineering thinking into an industry that is already struggling to find the next generations of good process engineers.
THAT WAS A SAMPLE OF

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