

Steel plant upgrade satisfies pressing needs

One of the UK's largest steel processors has upgraded the controls on one of its press lines and has taken the opportunity to improve safety at the same time as boosting its throughput and cutting its operating costs.

FROM ITS ROOTS in the late 1960s, West Bromwich-based Steel & Alloy has grown to become the UK's largest independent automotive steel processor. The company sources metal from all over the world and processes more than 300,000 tonnes of steel every year. It is an approved processor for both Arcelor and Corus.

Steel & Alloy's two West Midlands sites boast more than 18,580m² of processing and storage facilities, and include production equipment such as slitting, blanking, press working, shearing and washing and oiling plant

S&A was one of the first suppliers to provide tier-one automotive companies with first operation presswork services, such as the blanking of trapezoidal and irregularly shaped parts. It also pioneered the introduction of multi-strand blanking lines and coil fed press lines.

"We started offering this service and soon increased our press blanking capacity following the acquisition of a pair of 500-tonne and 600-tonne presses from Mercedes in Germany," recalls S&A's operations director, Max Coleman. "We equipped these with stacking units and subsequently integrated the 600-tonne Weingarten press into a complete full-finish line capable of producing

outer skin panels for the automotive industry with precision levellers and a dedicated wash/oil unit.

"At the time," he adds, "the line featured semi-automated controls, with the press electrics independent from those controlling the stacker, levellers, slitting heads and other ancillary equipment."

Fundamental choice

As part of a major safety initiative at the company, Coleman and his colleagues re-evaluated the equipment and, recognising the safety benefits that could be achieved by completely automating the press line's operation, established a project to upgrade its control system.

The company faced a fundamental choice – whether to piggyback additional controls on top of the existing systems, or to go back to basics and replace everything with a purpose-designed, integrated system.

"While the first route initially appeared to be the lower-cost option, we were aware that the existing drives, motors and inverters were becoming obsolete," Coleman continues. "Furthermore, a fresh approach would enable us to standardise on drive equipment and components that were already in use on site.

"The adoption of common



An S&A operator at the main control station next to the 600-tonne Weingarten press. Material is fed into the press from the right, after passing through the decoiler, levellers, slitting station, looping pit and measuring/feed rolls.

drives, PLCs, HMIs and controlgear would not only provide spares compatibility, improve availability and help to reduce costs, but also enable operator training to be standardised," Coleman explains. "In addition, it offered the chance to incorporate diagnostics within the upgraded installation."

With Steel & Alloy opting for the second route, the success or failure of the project focused on choosing the right supply partner. "[The Telford-based systems integrator] Transicon had previously undertaken a number of smaller control system projects on site and had established itself as a trusted partner," says Coleman. "In some ways, the company was the obvious choice. Even so, its final selection followed an exhaustive competitive tendering exercise."

Excessive wear

Transicon's technical director, Dave Caple, set about analysing every part of the S&A line to compile a technical specification. His study highlighted the fact that the clutch and brake components in the press were suffering from excessive wear, due to the stop/start operation needed to accommodate the parts-stacking system.

This not only required manual intervention by the operator, but also gave rise to inconsistencies in

the process – notably in the wash/oil section – which could lead to problems during second and subsequent press operations. As a result, the specification called for the press controller to be rewired.

A detailed project plan was drawn up to ensure that the line would be out of production for as short as possible. The final schedule centred on an intense six-week on-site installation and commissioning period, during which the line would be out of action for just four weeks.

Before this, Transicon designed all of the control system elements and panels based on an integrated system incorporating a zoned safety PLC, which would allow safe access to the machinery when needed. As much pre-wiring as possible was completed before the power was switched off.

"Despite the inevitable glitches and unexpected hiccups that emerged, everything was installed and power was restored within three weeks," says Coleman. "Following final commissioning and adjustments, the line was back in production – both on time and on budget – by the end of the fourth week.

"Considering the nature and size of the project, and the consequences of over-running the timing plan, the installation went

very smoothly," he adds. "It's a testament to the skill and commitment of the Transicon engineers that everything was completed right first time, as well as right on time."

The line comprises: a decoiler, which can be controlled via its own free-standing console; a pair of levellers for straightening the strip; and a slitting head to trim the raw material to the required width. The strip then passes through a looping pit, which acts as an accumulator to accommodate variations in the press feed rate, while allowing the steel strip to be levelled continually, before passing through measuring/feed rolls immediately ahead of the press, where the line's main control station is positioned. After processing, components are stacked onto pallets by an automated magnetic stacker, ready for shipping to the customer.

Synchronised control

All stages of the process are synchronised by the control system for optimum throughput and minimal operator intervention.

At the start of each new job, all the operator has to do is select the pitch distance for to the component to be manufactured, and specify the number of parts needed. After he has confirmed

the number of stacks and the spacing between them at the outfeed station, the system calculates the feeds for all the mechanical elements of the line, including the decoiler, levellers, and press feed rate, as well as the pattern used by the stacker.

The line, which incorporates interlocked guarding and numerous additional safety and diagnostics capabilities, has performed well since returning to production.

"First and foremost, it has eliminated any potential safety issues associated with the previous controls – which was our primary objective," says Coleman. "However, the new control system has provided some significant additional benefits. It enables the press to run in continuous mode, reducing wear and maintenance costs, while also providing greater consistency of finished part quality. The system is also extremely easy to use – in no small part due to the close involvement of our operators in the design and layout of the control consoles. So it's a 'win-win' situation all round."

On the strength of the project's success, Steel & Alloy has placed further contracts with Transicon to refurbish another two press lines, and to upgrade a slitting line at its second manufacturing site in West Bromwich. **D&C**



S&A's new control panel – designed, built and installed by Transicon – includes Control Techniques DC drives, Indramat AC drives and Rockwell PLCs. The company doesn't have allegiances to particular suppliers and picks the most appropriate equipment for each installation.



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