

3R Software Solutions

# Integrated workshops for pipe pre-fabrication

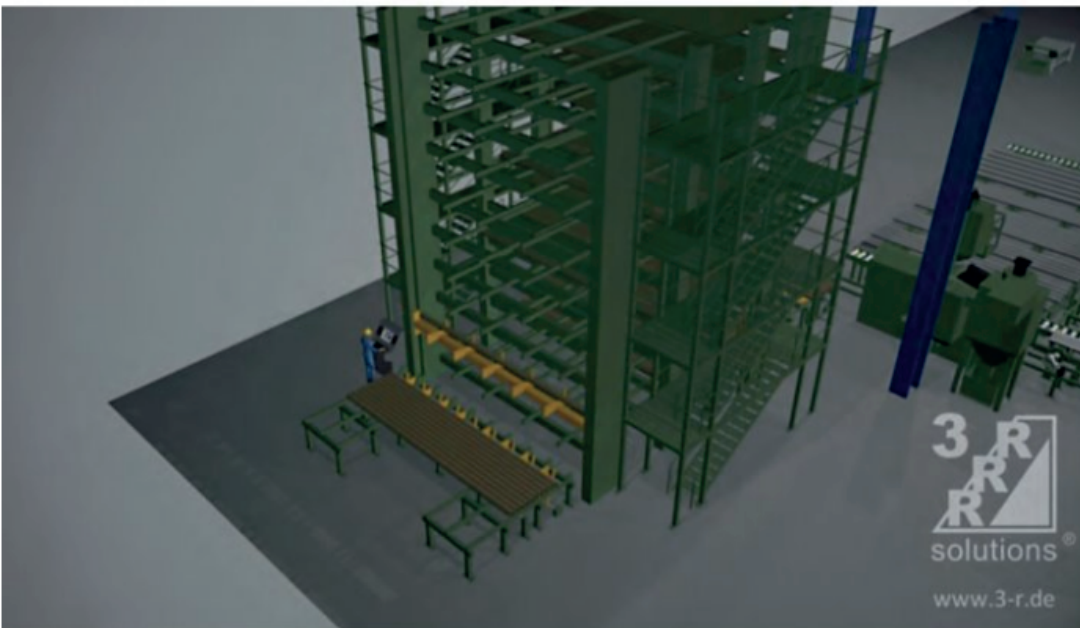
While automation of fabrication processes is common in the production of pipes it is only rarely seen in the pre-fabrication of pipe spools for end-users. In most cases automation extends to individual processes and tasks, and is often only used by companies who fabricate large batches of identical spools, such as the automotive industry. Companies who fabricate small batches each of hundreds or thousands of different spools and geometries generally consider automation to not be economically viable, with a limited return on investment for no significant benefit in fabrication.

The German specialist company 3R solutions, however, takes a different approach. "Automation can also be feasible for pipe-shops that build each type of spool only a few times, or even once," says CEO

Georg Schulze-Dürr. "The key factor is to see the entire workshop as one system of interdependent components, and to optimize and control the interaction of these components with an integrative software system that provides all required data."

This integrative software system, which has been expanded and improved constantly over the past 35 years, is the key to the approach 3R solutions takes to workshop integration. "Many customers have beautiful 3D models of the systems they want to build," Schulze-Dürr explains, "but then they manually redraw them as 2D drawings for fabrication, and need to calculate the data to feed to the machines. Then the shop manager gets a stack of hard-copies and needs to decide the best order in which to process the jobs to avoid idle times and bottle-necks. All of this can easily be handled by a dedicated software system."

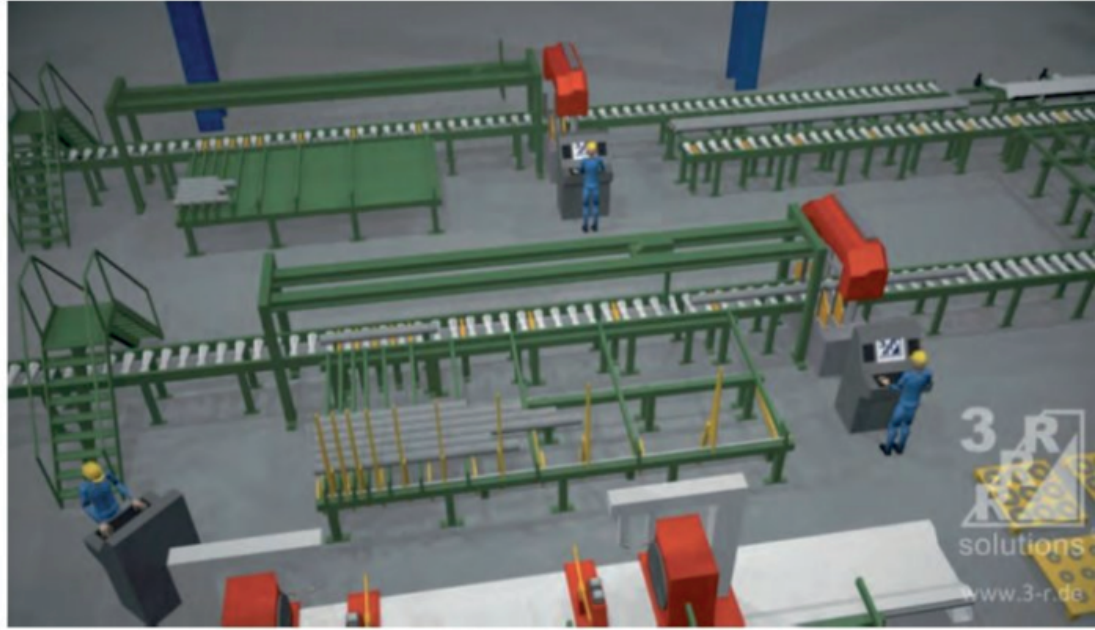
The same is true with creating fabrication documentation and reports. According to Schulze-Dürr: "If I need five minutes to prepare a bill of material, worksheet or welding report for a spool, it does not sound like much. But if I have a thousand drawings in my project, with five spools each, and I am planning on ten projects a year, saving these five minutes by using the right software can result in impressive savings. If I can then use the same software to avoid idle times at my machines because it provides all the data and balances my workload, I can achieve savings that reach six or even seven figures per year."



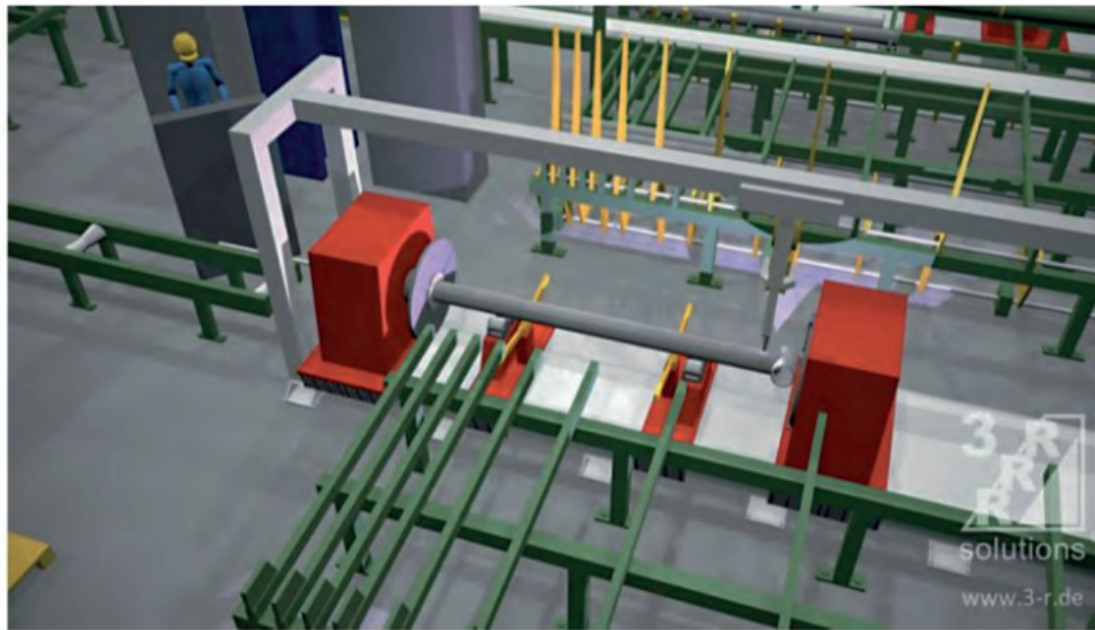
*An automated high-rise pipe dispenser can be used to store hundreds of pipes of different dimensions on very little floor space. The first-in / first-out system offers additional benefits.*

But while the software is the brains of an integrated workshop, the shop itself needs to be carefully planned for automated fabrication. Rather than seeing each machine and processing unit as an autonomous unit, the flow of material and data throughout the process needs to be considered, with logistics and support systems to match. “Our philosophy is that no machine should ever have to wait for material.” says Schulze-Dürr. “With our software we know beforehand which pipe is needed next, so we can bring it to the machine or work station while the operator is still working on the previous spool. Thus as soon as he is done with the current job, he can immediately start on the next one. And since we know what fittings or consumables are needed at each position throughout the day, they can be prepared accordingly and brought there beforehand, so a fitter for example will not need to get the fittings for his next job from some shelf or box, but has them all on a pallet right at his table. This can save quite some time since there is no double-handling.”

In order to reduce idle times even more, sophisticated storage and transportation systems are used, including automated high-rise pipe dispensers, roller conveyors, plate-belts and buffer tables. Schulze-Dürr: “Very often production managers ask us to improve their processes because they cannot reach their expected output with the machines that they have. When we look at their production, we see that the machines could easily handle the required numbers, but they are running at only 50 % of capacity or even less, because the internal logistics of the shop have been badly planned. If I can cut 500 units, and I can weld 500 units, but I use a ceiling crane capable of han-



*Centralized cutting with automated measuring tracks and software optimization ensures high cutting accuracy, minimizes scrap and is a key factor in smooth workflow operations.*



*Automated or mechanized welding can be made even more efficient by utilizing innovative concepts and optimized machines, such as this internal clamping system that allows immediate welding without tack-welding.*

dling only 300 units to move them from the cutting to the welding, then the solution to my problem is not bigger or more machines.”

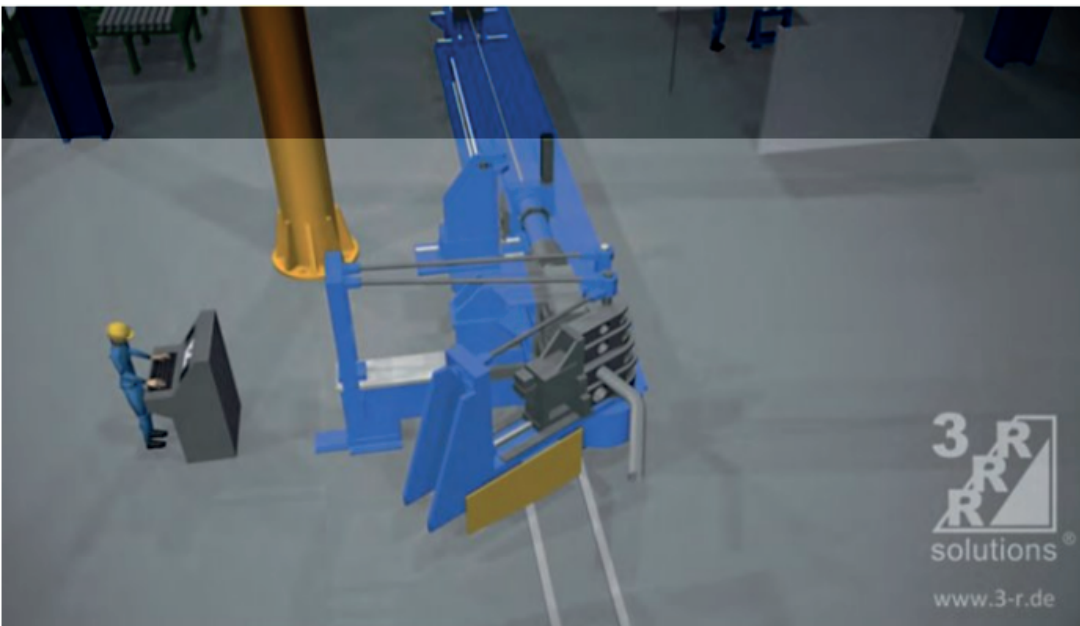
This is the reason why 3R solutions offers consultation services, where existing processes are examined and evaluated, and the best feasible

solution for automated fabrication is determined. Major recent projects include three automated pipe workshops for a large offshore yard in Singapore and an automated workshop for shipbuilder in Romania. "The Singapore shops are probably the most modern shops for offshore fabrication in South East Asia," says Schulze-Dürr. "The customer started out with a shop for carbon steel, including transport, centralized cutting (thermal and mechanical) and pipe-bending. Over the course of several years he expanded it to include automated welding and an additional pipe dispenser, as well as more and more software features. Then last year he gave us the order to also automate his fabrication of stainless steel pipes as well as a shop for welding specialized spools for the use on oil rigs."

With the close cooperation with leading machine manufacturers both from Germany and abroad 3R solutions has the benefit of being able to select the best possible

machines for each project. Schulze-Dürr: "We do not build machines ourselves, and we are not agents of any manufacturer. We are completely independent, and that allows us to select the best suited machines on the market and have them adjusted to our specifications if necessary. Since each customer has different requirements, each customer needs his own solution. If we had to follow a single manufacturer's catalogue, it would restrict our options and limit our flexibility. But since we have a good working relationship with our partners, our customers profit as well."

In conclusion Schulze-Dürr says "The worst mistake project managers can make when planning a new shop or looking to optimize their existing shop, is to look at each machine on its own and then make the decision based on the price tag. They need to consider the full flow of material, the way the machines work together. And this is where spending a little extra money to call in an expert first can help save not only a lot of money in the long run, but also a lot of frustration."



*CNC-bending machines can offer a faster and cheaper alternative to welding elbows, offering significant savings if utilized properly.*

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