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TURBOMACHINERY

THE PATH TO AR-SUPPORTED QUALITY ASSURANCE

REACHING NEW LEVELS OF PROCESS EFFICIENCY IN QUALITY ASSURANCE WITH KONICA MINOLTA'S AIRe LENS

The Siemens plant in Mülheim, Germany, is known as the world's most advanced location for the design and production of gas turbines, steam turbines and generators for power plants. In order to ensure more sustainable product development, the focus is always on improving energy efficiency, reducing raw material consumption and CO₂ emissions. The customers range from energy suppliers to international power plant projects. Since 2017, Mülheim has also been the service location for the business with generators as well as gas and steam turbines. Siemens sees this location as spearhead for the application of new production technologies. In order to test new augmented reality solutions in its quality assurance processes, they chose Konica Minolta as the partner to pilot appropriate wearables technology.

CHALLENGE

- Utilise wearable digital technology in production to support workers in their daily tasks
- Increase quality standards and reduce possibilities for errors
- Expand productivity and efficiency in production
- Support workers in difficult quality management processes

SOLUTION

- Konica Minolta's AIRe Lens to introduce digital augmented reality technology into the daily processes of quality management in order to take advantage of Industry 4.0 technology

ADVANTAGES

- Speeding up processes while maintaining the highest level of reliability
- Ensuring highest product quality for customers
- Driving competitive advantage in manufacturing processes



“The AIRe Lens is a highly promising solution for supporting us in the detailed measurement process of our quality assurance. The feedback from the operators testing it was very positive, not only with regard to the mobility and light weight of this solution, but also concerning the unhindered vision compared to other smart glasses solutions, thanks to the high transparency and position of the lens. Therefore, the device can be very well integrated into employees’ PPE*, which is why there is no impairment of occupational safety.”

Julian Melsbach, Project Lead implementation of smart glasses
Siemens AG, Mülheim

* PPE: Personal Protective Equipment

The dawn of augmented reality in industrial environments

The Siemens production site in Mülheim, Germany, is the company’s most advanced location for the manufacturing of industrial turbine machinery. Consequently, Siemens is driving both product as well as process innovation at this site, exploring the possibilities Industry 4.0 solutions have to offer. To digitalise previously manual processes, augmented reality (AR) devices and other wearables are at the top of the list, as they can support the workers in their daily procedures and help them perfect their craft. A dedicated team of experts was set in place at Siemens to seek out and evaluate the potential tools and technology that can fulfil these high expectations.

As Konica Minolta’s AIRe Lens is specifically designed for applications in industrial environments, it was quickly singled out as a suitable solution for a pilot phase. Crafted to meet the highest industry requirements, it has a battery life that lasts seven hours and, if a change is needed, is hot swappable. It is optimised to ensure operator safety, as it has a more than 70 % transparency to ensure it does not block the user’s view and can be combined with other safety gear. It projects an image equivalent to a 42-inch screen with Full HD resolution virtually placed 2.5 metres in front of the worker, displaying all information they need to perform their tasks. With a weight of the head-mounted display (HMD) of just 35 grams, the product is very light and can be worn for a whole work shift.

The AIRe Lens had previously been tested successfully in a pilot project for step-by-step guidance in complex assembly processes at the Siemens site in Brno. The very positive results were so striking that the dedicated Siemens project team from Germany evaluated other use cases where this unique solution from Konica Minolta can help to support employees with their tasks at the Mülheim location. Together with the Konica Minolta experts from the European Business Innovation Centre (BIC), a further very promising application field was identified: the complex measurement process needed in quality assurance. To test the application, a one-month pilot phase was set up in which 20 workers were equipped with the AIRe Lens solution.

Quality assessment empowered by augmented reality

The measurement process of various sorts of turbines is currently very labour-intensive and time-consuming. It needs to be executed by a team of two, with one worker measuring the workpiece and the other worker noting the up to 1,800 measurement values in a written protocol. In a further step, the data is digitalised by the quality assurance team.

Using the AIRe Lens for guidance and visualisation, as well as a numeric keypad for entering the values, the worker measuring the turbines can directly digitalise the values themselves – while maintaining full movement abilities. This mobility is crucial, as some spots for measurement are quite hard to reach. The AIRe Lens shows the recorded values in real time so the worker can double check the validity on the spot. This way, the quality assurance measurements can be conducted significantly faster, while maintaining the highest level of reliability and control.

Highest level of usability for an ideal application

“It was especially striking to us that the workers were able to work with the AIRe lens without having to adjust their routines. The operators in the test said they could very well imagine working with this solution in the future.

The device can be worn together with prescription glasses as well as all the necessary safety gear such as safety glasses, helmet or safety harness – without hindering any workflows. The possibilities we have with this solution look very promising as the measurement process can be streamlined in a very productive way,” explains Julian Melsbach, Project Lead implementation of smart glasses at Siemens in Mülheim. Every worker can now perform the measurement process by themselves which is why the team of two can significantly lower the time they need for one turbine.

“While we are still in the stage of testing the new use case, we clearly see the value of both the solution as well as the close collaboration and communication with the Konica Minolta expert team for digital manufacturing technology from the European BIC. We are impressed by the flexibility of this technology. And we highly appreciate Konica Minolta’s approach to thoroughly analysing and understanding our internal company processes and environment in order to truly tailor their solution to our needs. We are looking forward to developing this process even further,” Melsbach concludes.



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