TATA STEEL EUROPE CASE STUDY

Tata Steel’s project team selected North East security integrator, 2020 Vision Systems and security solutions provider, icomply to deliver an ambitious initiative to change the way an entire steel mill is controlled. The challenge was to interface state of the art surveillance technology with mill equipment dating back in some cases to the 50s and 60s.
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Client

Tata Steel Speciality Steels is part of the Tata Steel Europe, the second largest steel producer in the EU, and is one of the world’s top 10 manufacturers with operations in 26 countries. The company supply steel and related services to the construction, automotive, packaging, lifting & excavating, energy & power, and other demanding markets worldwide.

Tata Steel Speciality Steels focuses on offering a wide variety of carbon, alloy and stainless steels designed to meet the needs of some of the world’s most demanding applications in markets ranging from aerospace to oil & gas, power generation and industrial bearings.

Challenge

The realisation of an ambitious vision to change the way in which the mill is controlled. The steel industry is a ‘heavy industry’ and can be a dangerous trade, with a small number of employees exposed to the heat of hot metal, airborne contaminants and noise. Along with the safety hazards inherent in giant plants such as the movement of large masses of materials and large scale equipment. Steel production takes raw materials (e.g. iron ore, coal and limestone) or recycled steel scrap through a number of processing stages, including iron making, primary and secondary steelmaking, casting and hot rolling. Followed by a fabrication processes: cold rolling, forming, forging, joining, machining, coating and/or heat treatment. These complex processes produce a wide variety of steel compositions, in many different shapes and sizes, each tailored closely to the requirements of the use of the steel.

Stockbridge Billet Mill was very traditional in its operation. Controlled by 13 different pulitrils, each one driving a different part of the rolling process. In order to improve safety, drive cost savings and improve efficiency of the mill, a project team was set up to look at rationalising the number of pulitrils, resulting in the radical idea of moving all the operators from the mill into one large control room, and driving the process with cameras. icomply would be pivotal in moving workers away from the potential dangers of steel rolling and giving them eyes in a control room instead, through a complex integration process. The cameras were to act as the eyes for the operators giving them full view of their tasks, allowing them to monitor the flow of steel and the mill operation from a central location. In order for this to succeed, there would be no room for latency in the video feeds and icomply would have to rise to the challenge of integrating hardware suitable for real time production. This would culminate in both operational and safety benefits, making it easier for operators to communicate with each other, and moving operators away from the mill line.

It is now two years on and the mill is currently operating successful trials. Senior Development Engineer, Paul Hudson said: “Getting to the current stage has had its fair share of challenges. Firstly, we needed a camera supplier that could recreate a crisp, sharp image with no glare and no delay – something that was unheard of in the market. Secondly, we needed to integrate the whole system, so rather than each part of the process sending a signal to its individual pulitril, we set up a spinal column down the length of the mill. This acts like a central nervous system, feeding information from the equipment directly to the brain, i.e. the super pulitril.”

Solution

High calibre monitoring hardware was needed for the job, and 2020 Vision Systems fought off strong competition to implement an IP centric solution, consisting of one high speed PTZ camera and 29 static high definition cameras from the highly acclaimed Axis Communications range. The 30 cameras which were deployed throughout the mill, enable operators to observe the mill process and monitor the flow of steel; five provide full HD1080p image quality for close inspection. All cameras provide true day/night operation to optimise performance in poor lighting, and are fitted with a varifocal lens, enabling the exact field of view to be set, commensurate with the required viewing angles. With each camera and lens combination, enclosed in an IP66 rated environmental housing.
To ensure optimum bandwidth and connectivity required for large frame sizes and the very high frame rates necessary for live ‘real time’ viewing without latency at the control room the system utilises an HP Pro Curve network. With each camera residing on a 1Giga bit Ethernet fibre backbone via a node point utilising power over ethernet (PoE) enabled switches icomply, currently leading the security industry with their bespoke, open platform control management solutions, provided seamless integration work as they connected the various cameras to the control room. Within the control room, cameras were wall mounted and workers were given total control of operations in the mill with specially designed chairs and joysticks. icomply were also instrumental in integrating the Scada system - a complex algorithm which decides when the system sends messages to specific screen monitors from various saws. Using this system along with well integrated CCTV hardware, it is possible for an operator to take control of all operations while maintaining a safe distance from the actual production of the steel, and all operations and cameras are recorded for health and safety purposes.

Result

Thanks to the enthusiasm and dedication of the team at Tata Steel Speciality Steels, and also the ingenuity of 2020 Vision and the integration carried out by icomply, the bar has been raised and efficiency at the mill is soaring to new heights.

Two years later and the super pulpit, or ‘Starship Enterprise’ as it has been christened by the operators, is successfully performing rolling trials. This is the first significant investment in the mill in over a decade and operators are adjusting to their new roles extremely well.

Paul Hudson commented added: “The operators themselves have shown real enthusiasm in learning how to do their jobs in a completely new way – I couldn’t have wished for a better response.”