



Tata Steel has devised a new blast-proof video wall that has enhanced the safety of its workers on the shopfloor.

## THE CONTEXT



Small explosions are a common phenomenon in basic oxygen furnace (BOF) steel-making and these can endanger workers on site. Such explosions can cause damage to the control room, as has happened in Tata Steel's plants in India, and occasionally turn fatal like at Tata Steel Europe's Port Talbot plant in September 2014. This is why safety measures that protect plant personnel without hindering ongoing operations are crucial.

## THE INNOVATION



The most obvious solution was to move the control room to a safer location, but this would have called for capital investments and downtime. Also, the shopfloor didn't have space for a new control room. Hence, the company came up with an out-of-the-box idea - creating a blast-proof video wall to protect the control room and then provide the operators with live images of the furnace. The operators needed a seamless and real time view of the steel-making process, so a digital image processing-based system was devised. To ensure a 180-degree view, a special camera with a fish-eye lens with pan, tilt and zoom capabilities was installed. However, the camera's position did not give the operator an optimum view, so the team designed an innovative perspective-correction algorithm. This ensured that the operators could safely view the steel-making processes as though they were looking at it live through a glass pane.

## KEY CHALLENGE

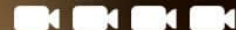


### THE BIGGEST CHALLENGE IN CREATING A REAL-TIME IMAGING SYSTEM IS THE LATENCY IN IMAGE TRANSMISSION

There is always a time lag in image transmission. For example, images captured during a cricket match have a 30-second lag before they are seen on TV. Tata Steel determined that the latency of image transmission in the plant was nearly one second. This was unacceptable. It meant for instance, that when the converter was actually tilted at a 75-degree angle, the operator would see it only at 45 degrees on the video wall display. To prevent accidents from inaccurate imaging, a novel proprietary algorithm was devised that would compress and transmit the images and reduce the time-lag to less than 10 milliseconds, thus making it almost real-time.



## THE IMPACT



The new video wall is a critical safety initiative as it prevents nearly 12 to 15 workers from being exposed to life-threatening hazards daily. The project has also generated data on the core steel-making process, which can be used for video analytics-based digital initiatives, such as automated systems, in the future.